FLEX-ERECT

Safety, Health & Environmental Program

This safety program was developed in cooperation with:

COMPLIANCE SAFETY CONSULTING

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SECTION 1

SUBJECT: Safety Program Responsibilities

GENERAL: Flex-Erect has established a comprehensive, Company Specific Safety Program. The ultimate purpose of the Safety Program is to protect the greatest asset of the company: it's employees. Specifically, the Flex-Erect Safety Program has been designed to address the issues of evaluating potential hazards associated with our work, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

The purpose of this document is to outline the responsibilities of each level of management and employees within Flex-Erect. The company expects all employees to be familiar with the contents of this document as they pertain to their specific place in the company.

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Safety Program Responsibilities

1. Written Program.

Flex-Erect will review and evaluate this program periodically, and when regulatory or when operational changes occur that require a revision of this document.

2. Company Owner Responsibilities.

The Owners of Flex-Erect recognizes the importance of safety and has committed to creating a place of employment, which is free from recognized hazards. Flex-Erect is ultimately responsible **for the safety of its employees. Flex-Erect will ensure that all levels of management in the** company are delegated the necessary authority to cultivate a safe environment and to take the appropriate actions to correct any deviations or deficiencies relating to safety on the job. Flex-Erect will also be responsible for making available the funds necessary to support the Safety Manager, which will ensure that employees are provided with effective safety equipment to perform their **work.**

3. Safety Manager Responsibilities.

The Safety Manager will be responsible for the day-to-day management of the safety program. The Safety Manager will assist Flex-Erect in remaining in compliance with all applicable health and safety regulations. He or she will keep informed of current regulations and changes to those regulations that apply to Flex-Erect. In addition, he or she will supervise the enforcement of safety policies and procedures by supervisors and employees. The Safety Manager will identify, coordinate, and arrange for training sessions to ensure that all employees are equipped with the needed safety skills and knowledge. The Safety Manager will perform inspections of jobsites and facilities and take the appropriate actions to correct any deviations or deficiencies relating to safety on the job. He will serve as a resource for Supervisors to assist them in daily enforcement of the safety program. The Safety Manager will monitor, review, and serve as a liaison for the safety of subcontractors to avoid placing this company or it's employees at risk.

4. Project Manager Responsibilities.

Project Managers will be responsible for safety of their employees. They will be expected to involve the Safety Manager at the beginning of every project even before work has started. Project Managers will take recommendations from and work with the Safety Manager to ensure the safety of employees on the job. Project Managers will also monitor the safety of subcontractors to avoid placing this company or it's employees at risk.

5. Supervisor Responsibilities.

Supervisors are responsible for the daily enforcement of the policies and procedures in the Flex-Erect safety program. They will be responsible for all aspects of employee safety in their respective areas. Supervisors will take recommendations from and work with the Safety Manager to provide a safe jobsite for all employees. Supervisors will conduct weekly safety toolbox talks and daily task specific safety meetings. Supervisors will monitor the safety of employees on a daily basis and take the appropriate actions to correct any deviations or deficiencies relating to safety on the job. Supervisors will be attentive to employee safety concerns and report concerns to the Safety Manager. They will keep in communication with the Safety Manager to ensure all employees receive training, refresher training, or retraining as needed. Supervisors will monitor the safety of subcontractors to avoid placing this company or it's employees at risk.

6. Employee Responsibilities.

Employees are the first lines of defense as it pertains to safety at all Flex-Erect jobsites. Employees are expected to abide by all of the safety policies and procedures in the company safety **program. They will be held responsible for their own safety and are expected to report unsafe** conditions to their Supervisors immediately. If the Supervisor is unavailable, they will report safety violations or concerns to the Safety Manager. Employees, if feasible, are also expected to correct safety violations within their immediate area. They will ensure they report to work in a state of readiness, with the appropriate clothing, and with all issued personal protective equipment. Employees will only operate equipment on which they have been trained and authorized to use. They will report accidents, injuries, and near misses immediately to their Supervisor.

7. Modification of Safety Manual.

This manual shall be updated by the direction of the Flex-Erect management team and under the direction of the company authorized Safety Manager. This manual shall be reviewed on an annual basis by the Flex-Erect Safety Committee. However, this manual may be reviewed and modified at any time prior to the annual review to maintain compliance with local, state, and federal requirements. Any updates to this manual shall be immediately available to all employees of the company. All changes to the manual will be distributed to the employees via a Special Safety Meeting called by Management.

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SECTION 2

SUBJECT: Incident Response & Management Safety Procedures

REGULATORY STANDARD: OSHA - 29 CFR 1904

GENERAL: This Program is intended to provide instructions to our personnel responding to an incident.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect Owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received awareness training before assignment.

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Incident Response & Management Safety Procedures

1. Written Program.

Flex-Erect will review and evaluate this program periodically, and when operational changes occur that require a revision of this document.

2. Goals

Zero Safety Incidents – that's our goal at Flex-Erect. We must work together to achieve this goal.

Be Prepared – Know where your first aid kit is, know where the nearest hospital is, and know where this packet is at all times.

Create a Safety-Conscious work crew by requiring workers to actively look for job hazards and correct them. No job hazard is acceptable.

Remind your workers DAILY that safety is ALWAYS first and there is no excuse to perform unsafe work.

Remind your workers DAILY that any accident, no matter how small, must be reported to you immediately.

Read this guide to know what to do in case of an injury.

Prepare

- Have a first aid kit stocked & readily available
- Have at least one employee on site that obtains a current 1st Aid & CPR certification.
- Identify the nearest Occucare International as our primary Urgent Care location. Occucare also provides after hour & weekend urgent care. An alternative urgent care clinic will be established for off-site work locations. (contact HR if you need assistance) **Occucare International's contact information listed below.**
- If the work area is not near an Occucare International location, contact the safety department prior to starting the project so we can identify the nearest emergency/ medical provider, make contact and establish our incident management procedures with the emergency/ medical provider.

3. Incident Response Procedures.

- Secure the Scene
- Provide 1st Aid Assistance.
- **If the injury requires advanced medical attention, call 911!**
- Report the Incident to your supervisor immediately. The supervisor shall report the incident to our safety director and our project management team immediately. The incident shall also be reported to the controlling contractor/ owner no matter how minor.
- Company Contact: **Steve Thomas 713.906.0277** contact immediately.

- Safety Contacts: **Pablo Reyes 832.808.4250** and/ or **Enrique Garza 281.979.2712**.
- Drive injured employee to Occucare International for treatment. **Do not allow the injured employee to drive themselves to the clinic.** Occucare International locations provided below**. Occucare International also provides after hour & weekend services.**
- Occucare International is also available for after hour or weekend treatment.
- Inform the physician of the company light duty program. **Refer to the Return to Work Program below.**
- Request drug and alcohol test at clinic.
- Remain at the clinic with our personnel until release by the doctor. Provide updates to the project management team as needed.
- Request Copies of the doctor's status report and all related documentation for company records.

Documentation

- Complete an Incident Investigation Summary Form
- If witnesses were present, have them complete a Witness Statement
- Provide copies of the completed incident investigation report, witness statements, doctor status report and drug & alcohol test results to the office & safety department for records.

4. Subcontractor Incident Response Procedures.

- Secure the Scene
- Assist the Subcontractor's site supervisor in providing 1st Aid to their personnel as needed.
- **If the injury requires advanced medical attention, call 911!**
- Report the Incident to your supervisor immediately. The supervisor shall report the incident to our safety director and our project management team immediately. The incident shall also be reported to the controlling contractor/ owner no matter how minor.
- Company Contact: **Steve Thomas 713.906.0277** contact immediately.
- Safety Contacts: **Pablo Reyes 832.808.4250** and/ or **Enrique Garza 281.979.2712**.
- Report the Incident to the subcontractor's project management team immediately.
- The subcontractor's site supervisor or project manager shall drive the injured employee to their medical facility for treatment. **Do not drive or allow the injured employee to drive themselves to the clinic.**
- Request verification of a drug and alcohol test for the injured employee from the subcontractor. Do not request or accept a copy of the drug and alcohol results.
- Request a complete incident investigation from the subcontractor's project management team.

Documentation

- The subcontractor shall complete an Incident Investigation Summary Form
- If witnesses were present, have them complete a Witness Statement
- The subcontractor shall provide copies of their completed incident investigation report which will include drug screen verification, root cause analysis & corrective measures and the injured employee's status for our records.

5. Return to Work/ Light Duty Program

Return to Work

Flex-Erect offers a Return to Work Program for Injured or Ill employees that will comply with ANY work restrictions.

We believe that meaningful work assignments are a real step in helping employees recover and transition back into prior job assignments. All work restrictions will be strictly adhered to!

From management training programs to pre-fabrication work in our shop – we will work hard to find an accommodating job assignment for an injured employee. We will issue a modified job description and extend a new job offer letter. We strongly feel that meaningful work will contribute to a quicker recovery. We want the employee to be able to return to a suitable position after this visit is complete, and we will find a meaningful, safe assignment for the employee to return to.

Light Duty

Restricted (Light) Duty provides work to an employee who has experienced illness or injury on the job. Employees are our most valued asset! Safety, well-being, and work sustainability are key objectives at Flex-Erect when an employee is injured or ill, Flex-Erect will assist him/her in a quick recovery by allowing the employee to return to a temporary, meaningful, and safe job assignment.

Commencing on the first day of employment or any day thereafter, any employee who is injured or ill as a result of working shall be eligible to participate in the Return to Work / Light Duty Program.

A Return to Work / Light Duty Program is in effect to assist any injured or ill employee in maintaining a meaningful job assignment until he/she has fully recovered – at which point, the employee shall return to the same or similar job assignment prior to injury/illness. Immediately following initial treatment, FLEX-ERECT will issue a meaningful job assignment with full pay that is consistent with the Treating Physician's requirements to any employee who is injured or ill as a result of working.

A Return to Work program is mutually beneficial to the employee and to Flex-Erect

<u>The Employee Benefits</u>

- Engaging and accommodating work
- Transitioning back to the prior roll
- Increased self-esteem
- Maintaining and building new relationships at work
- <u>No lost wages</u>

<u>FLEX-ERECT Benefits</u>

- Retain a trained and experienced worker
- Reduce cost of lost production
- Improving work ethic and morale
- Building better communication

<u>Provisions of the Return to Work / Light Duty Program</u>

Eligibility

1. The employee's medical condition temporarily prevents the employee from performing full regular duties including full-time work

2. The Treating Physician's provisions:
    a. Feels the condition is temporary, so far as can be determined and will likely improve
    b. Feels that maximum medical improvement has not taken place yet
    c. Has provided instructions for specific restrictions in writing to Human Resources

Work Placement & Compliance

1. A Bona-fide Job Offer Letter will be created based on work restrictions and provided to the employee for acceptance. This assignment is temporary.
2. All Return to Work / Light Duty job assignments MUST comply with a treating physician's written restrictions – an employee who feels that he/she is being asked to perform work outside of the guidelines must immediately notify his/her supervisor and Human Resources.
3. An employee who feels that he/she is being retaliated against or treated differently should talk with Human Resources immediately to resolve the problem.
4. The employee may be required to attend follow-up visits with the treating physician. The Company will accommodate the need for check-ups. However, it is the employee's responsibility to notify his/her supervisor AND Human Resources as soon as the appointment has been scheduled.
5. If the employee will miss work, he/she must contact his/her supervisor AND Human Resources at least 1 hour prior to the scheduled beginning of shift. If the absence is related to the injury or illness, tell Human Resources.

Working after an Injury Has Occurred

1. After an employee has seen the Treating Physician for the first time, he/she will be contacted by Human Resources for a Light Duty job placement. The employee will be given a bona-fide job offer letter to review and sign. This offer letter abides by all job restrictions set forth by the Treating Physician.

2. The employee will return to work. A modified assignment will allow the employee to work at full pay and up to 40 hours as allowed by physician's written comments.

3. The employee is subject to all job rules and will still be subject to the Company's discipline policy as detailed in the company safety program.

4. When the employee is cleared to return to full-duty or has reached maximum medical improvement, Flex-Erect will make every effort to return the employee to his/her previous assignment or a similar one if allowed by Treating Physician. If maximum medical improvement

has occurred and the employee must work with restrictions, then the company will allow the employee to work in the modified job assignment set forth in the bona-fide offer letter.

5. If at any time an employee feels that he/she is being discriminated against or retaliated against as a result of the injury, it is the employee's responsibility to notify Human Resources immediately for a full investigation.

6. Urgent Care Facilities- Recordable & Lost Time Protocols.

Flex-Erect has partnered with Occucare International because of their Recordable & Lost Time Prevention Protocols. Listed below are the protocols followed by Occucare International.

- **Return to Work Program-** The facilities have been instructed of our return to work program and will work with our company to achieve full duty status.
- **Verbal Instructions-** Verbal instructions are communicated not prescribed by the doctors for light duty.
- **Medical Procedures-** The doctors will use a non-recordable procedure for medical treatment when possible.
- **Sample Medications-** Sample medications are provided when possible to prevent doctor's from writing prescriptions.
- **Over the Counter Medications** – The doctors will recommend over the counter medications when possible as a substitution for prescription medications.
- **Overnight Observation/ Diagnostics-** The doctors will recommend overnight observation/ diagnostics instead of admitting a patient whenever feasible.

7. Urgent Care Facilities- Location & Contact Information.

Emergency Contacts- Business Hours

Occucare International (7:30 AM to 4:30 PM)

- **Houston**-5151 Katy Freeway Suite 170 Houston, TX 77007
  Phone: 713.802.0801
- **Deer Park**- 321 W. San Augustine Deer Park, TX 77536
  Phone: 281.476.4616
- **Port Arthur-** 3717 Royal Meadows Blvd. Port Arthur, TX 77642
  Phone: 409.960.6937
- **The Woodlands-** 17030 Nanes Suite 108 Houston, TX 77090
  Phone: 281.893.0521

Emergency Contacts- After Hours

Occucare International (4:30 PM to 7:30 AM & Weekends) 1-866-346-7601

8. Urgent Care Facilities- Maps

Occucare International- Locations

Occucare INTERNATIONAL



5151 Katy Freeway
Suite 170
Houston, TX 77007

Houston

713-802-0801
Fax 713-802-2953
7:30AM – 4:30PM





321 W. San Augustine
Deer Park, TX 77536

Deer Park

281-476-4616
Fax 281-241-8271
7:30AM – 4:30PM





3717 Royal Meadows Blvd,
Port Arthur, TX 77642

Port Arthur

409-960-6937
Fax 409-724-1928
7:30AM – 4:30PM





17030 Nanes
Suite 108
Houston, TX 77090

Woodlands

281-893-0521
Fax 281-893-0537
7:30AM – 4:30PM



www.occucareinternational.com

9. Forms.

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Incident Investigation Form

Incident Investigation Summary

Contact your supervisor Immediately. Complete this form after an incident has occurred. Submit to the Safety Department or Human Resources upon completion.			
Company :		**Supervisor:**	
Location:		**Report Date:**	
Name & Phone of the Person Injured/ Involved (Also identify their employer)			
Name:		**Phone:**	**Company:**
Work History:	**Date of Hire:**	**Trade Specific Experience:**	
☐ **N/A**	**Name & Phone of Additional Person(s) Injured/ Involved (Also identify their employer)**		
Name:		**Phone:**	**Company:**
Work History:	**Date of Hire:**	**Trade Specific Experience:**	
Date & Time of Incident (a.m. or p.m.)	**Date:**	**Time:**	
☐ **N/A**	**Type of Incident? (Check all that apply)**		
☐ **Near Miss**	☐ **Property Damage**	☐ **Vehicle Damage**	
☐ **Non Recordable**	☐ **Recordable**	☐ **Fatality**	**Provide Notes Below**
☐ **N/A**	**Severity of the Injury/ Incident (Check all that apply)**		
☐ **High- Life Threatening/ Property Loss**	☐ **Medium- Recordable Injury/ Property Damage**		
☐ **Low- 1st Aid Injury (Non-Recordable)/ Minor Damage**			
☐ **N/A**	**Part of the Body Injured (Check all that apply)**		
☐ **Head**	☐ **Back**	☐ **Left Arm**	☐ **Right Arm**	☐ **Left Hand**
☐ **Right Hand**	☐ **Left Wrist**	☐ **Right Wrist**	☐ **Left Leg**	☐ **Right Leg**
☐ **Left Ankle**	☐ **Right Ankle**	☐ **Left Foot**	☐ **Right Foot**	☐ **Other**	**Explain Below**
☐ **N/A**	**1st Aid/ Medical Treatment Received**	**Explain Below**	
Drug Screen Conducted?	☐ **Yes**	☐ **No**	☐ **N/A**	**Provide Notes Below**
Follow Up Required?	☐ **Yes**	☐ **No**	**Explain Below**

☐ N/A	**Controlling Contractor / Owner Name:**	

☐ N/A **Location of the Incident (e.g. East Hallway, Second Floor, Northside Office, etc.)**

☐ N/A **Detailed Description of the Incident**

☐ N/A **Description of the Root Cause**

☐ N/A **Measures to Prevent Reoccurrence**

☐ N/A	**Witnesses**				
Name:		**Phone:**		**Company:**	
Name:		**Phone:**		**Company:**	
Name:		**Phone:**		**Company:**	

☐ N/A	**What Personal Protective Equipment was the injured / involved personnel wearing?**			
☐ **Hardhat**	☐ **Safety Glasses**	☐ **Work Boots**	☐ **Work Gloves**	☐ **Safety Vest**
☐ **Other P.P.E.**				

Pictures Recorded	☐ **Yes**	☐ **No**	**Provide Picture Description Below & Attach to the Final Report**

☐ N/A	**Additional Information**			
Signature of the Individual Completing this Report:				
Contact Information	**Phone:**		**Email:**	

Personnel Statement Form

Statement Summary

Contact your supervisor Immediately. Complete this form after a safety incident has occurred. Submit to the Safety Department or Human Resources with the incident investigation report upon completion.			
Company:		**Supervisor:**	
Location:		**Date:**	
Relation to the Incident			
☐ **Witness**	☐ **Injured**	☐ **Involved**	☐ **Other:**
Name, Contact & Company Information			
Name:		**Phone:**	
Company:		**Title:**	
Controlling/ General Contractor			
Date of the Incident:		**Time of Incident:**	
Location of the Incident:			
Description of the Incident			
☐ **N/A**	**What PPE was the affected Employee Wearing?**		
☐ **N/A**	**Additional Information**		
Signature of the individual completing this form:			

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SECTION 3

SUBJECT: Incident Prevention and Investigation Safety Program

REGULATORY STANDARD: OSHA - 29 CFR 1904

GENERAL: This Program is intended to address the issues of evaluating the hazards which have led or potentially would lead to an incident, communicating information concerning these hazards, and establishing appropriate protective measures for employees. All incidents will be investigated to the appropriate level with regards to incident severity.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received awareness training before assignment.

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Incident Prevention and Investigation Safety Program

1. Written Program.

Flex-Erect will review and evaluate this program periodically, and when operational changes occur that require a revision of this document.

2. Training Requirements.

The purpose of incident investigation training and education is to ensure that members of the incident investigation team and all of our employees are sufficiently informed about the incident investigation program.

2.1 Employees will be adequately trained about the Flex-Erect incident investigation program. Proper training will allow managers, supervisors, and employees to understand the procedures to follow to report an incident, hazards associated with a job or production process, their prevention and control, and their medical consequences prior to an incident occurring.

2.2 Training for affected employees will consist of both general and specific job training:

2.2.1 General Training. Employees will be given formal instruction on the hazards associated with their jobs and with their equipment. This will include information on the varieties of hazards associated with the job, what risk factors cause or contribute to them, how to recognize and report hazardous conditions, and how to prevent incident with their respective jobs. This instruction will be repeated for each employee as necessary.

2.2.2 Job-Specific Training. All employees will be trained in specific procedures associated with their jobs based on current JSA's and other specific procedures contained in the Flex Erect safety program.

2.3 Training for Supervisors. Supervisors are responsible for ensuring that employees follow safe work practices and receive appropriate training to enable them to do this. Supervisors therefore will undergo training comparable to that of the employees, and such additional training as will enable them to recognize hazardous work practices, to correct such practices, incident reporting/investigation requirements, and to reinforce the Flex-Erect safety program.

3. Incident Prevention.

Preventing incidents is the purpose of the Flex-Erect Safety Program. Preventing future workplace injuries in our company is the principle purpose of incident investigations. This document will provide a basis for studying and recording the reasons an incident occurred, identifying existing or potential job hazards (both safety and health), and determining the best course of action to take to reduce or eliminate these hazards.

3.1 Employee Responsibilities. Employees are expected to abide by all of the safety policies and procedures in the company safety program. They will be held responsible for their own safety and are expected to report unsafe conditions to their Supervisors immediately. If the

Supervisor is unavailable, they will report safety violations or concerns to the Safety Manager. Employees, if feasible, are expected to correct safety violations within their immediate area. They will ensure they report to work in a state of readiness, with the appropriate clothing, and with all issued personal protective equipment. Employees will only operate equipment on which they have been trained and authorized to use. They will report incidents, injuries, and near misses immediately to their Supervisor.

3.2 Supervisor Responsibilities. Company Supervisors are responsible for the daily enforcement of the policies and procedures in the Flex-Erect safety program. Supervisors will monitor the safety of employees on a daily basis and take the appropriate actions to correct any deviations or deficiencies relating to safety on the job. Supervisors will be attentive to employee safety concerns and report them to the Safety Manager. Supervisors will assist the Safety Manager in conducting incident investigations or conduct the investigation under his supervision. Supervisors will prepare a hazard report to document and report any hazards, which cannot be immediately eliminated.

4. Hazard Reporting.

The Flex-Erect Hazard Report will be used by all employees to report potential or known hazards. The following procedures apply:

4.1 Person reporting hazard:

- 4.1.1 Notify supervisor of the hazard immediately.
- 4.1.2 Prepare a hazard report.

4.2 Supervisor:

- 4.2.1 Notify all affected workers of hazard.
- 4.2.2 Notify client or controlling contractor of hazard, if applicable.
- 4.2.3 Ensure hazard is properly marked and controlled.
- 4.2.4 Add supplemental information to the hazard report, if applicable.
- 4.2.5 Forward report immediately to the Safety Manager.

5. Incident Investigation.

Incident investigation is primarily a fact-finding procedure; the facts revealed are used to prevent reoccurrences of similar incidents. The focus of incident investigation will be to prevent future incidents and injuries to increase the safety and health of all our employees. Each project management team will be equipped with a copy of these procedures, the incident investigation forms and a camera to assist in conducting an incident investigation.

5.1 Immediate concerns.

- 5.1.1 Ensure any injured person receives proper care.
- 5.1.2 Ensure co-workers and personnel working with similar equipment or in similar jobs are aware of the situation. This is to ensure that procedural problems or defects in certain models of equipment do not exist.
- 5.1.3 Start the investigation promptly.

5.1.4 Conduct an initial assessment to identify root cause and collect, secure and preserve evidence that will be used to support the incident investigation.

5.2 Reporting the Incident

5.2.1 Report the Incident to the Safety Department and Project Management Team immediately.

5.2.2 Report the Incident to the Client or Controlling Contractor, if applicable.

5.2.3 OSHA shall be notified within 8 Hours of a work related fatality.

OSHA shall be notified within 24 Hours of an inpatient hospitalization, amputation, or eye loss.

5.3 Incident investigation report. The Flex-Erect investigation report or similar form which details specific company requirements for investigation will be used to gather data to determine causes and corrective actions. As a minimum the form will contain the following areas of concern.

5.3.1 Incident investigation form data.

- Injured employee's name & contact number
- Date and time of injury
- Occupation or task being performed when injured
- Length of service
- Physician's and hospital name (if transported)
- Type of injury
- Resulting fatalities
- Description and analysis of incident
- Action taken to prevent recurrence and person
- Employee's statement
- Witnesses' Interview and statement
- Employer's Interview and statement
- Person completing form and date
- Person(s) reviewing form and date

5.4 Reviewers. All incident investigation reports will be reviewed by the Safety Manager and Project Manager involved to ensure pertinent information is transmitted to all concerned and that remedial action(s) are taken.

5.5 Incident investigation final report. The final report will be numbered in the upper right hand corner, Page of Pages. The report will include but is not limited to the following.

5.5.1 Investigation report form and pertinent data

5.5.2 Photographs/drawings/exhibits of scene

5.5.3 Narrative of incident

5.5.4 Contributing information

5.5.5 Findings and recommendations of review team

5.5.6 Action items and completion dates

5.5.7 Responsible persons

6. Sequence of Steps.

6.1 Once the injured employees have been treated and cared for, Supervisors must ensure that they, the Safety Manager, or other designated individual accompany the injured employee to the hospital or health care provider.

6.2 Supervisors will ensure that the area where the incident occurred is secured to avoid further injuries and allow opportunity for investigation.

6.3 Photographs of the site should be taken from different angles.

6.4 The employee involved in the incident and any witnesses in separate interviews will be asked to explain in their own words what happened. The witness statement will be read back to them and if accurate, they will sign it. It is important to document what the employee says and not influence them in any way.

6.5 The Incident Report form must be filled out completely. Ensure the directions for filling out the forms are followed. Statements shall also be completed using the witness statement form. Supervisors must submit completed forms to the Safety Manager for review.

6.6 Ensure that immediate hazards have been addressed and proceed with any follow-up actions identified in the Incident Report.

7. Incident Investigation Review

The safety department and the project management team will meet to discuss incident investigation. The goal of the meeting is to identify the root cause of the incident and to develop a safety measure to prevent reoccurrence. This will include, but is not limited to:

- Lessons Learned
- New Safety Procedure Development
- Personnel Safety Training
- Positive Reinforcement
- Personal Monitoring
- Disciplinary Action

8. Forms.

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Incident Investigation Report

Incident Investigation Summary

Contact your supervisor Immediately. Complete this form after a safety incident has occurred. Submit to the Safety Department or Human Resources upon completion.			
Client :		**Supervisor:**	
Location:		**Date of Report:**	
Name & Phone of the Person(s) Injured/ Involved (Also identify their employer)			
Name:	**Phone:**	**Company:**	
Work History:	**Date of Hire:**	**Trade Specific Experience:**	
Name:	**Phone:**	**Company:**	
Work History:	**Date of Hire:**	**Trade Specific Experience:**	
Date & Time of Incident (a.m. or p.m.)	**Date:**	**Time:**	
☐ **N/A**	**Type of Incident? (Check all that apply)**		
☐ **Near Miss**	☐ **Property Damage**	☐ **Vehicle Damage**	
☐ **Non Recordable**	☐ **Recordable**	☐ **Fatality**	**Provide Notes Below**
☐ **N/A**	**Severity of the Injury/ Incident (Check all that apply)**		
☐ **High- Life Threatening/ Property Loss**	☐ **Medium- Recordable Injury/ Property Damage**		
☐ **Low- 1st Aid Injury (Non-Recordable)/ Minor Damage**			
☐ **N/A**	**Part of the body injured (Check all that apply)**		
☐ **Head**	☐ **Back**	☐ **Left Arm**	☐ **Right Arm**	☐ **Left Hand**
☐ **Right Hand**	☐ **Left Wrist**	☐ **Right Wrist**	☐ **Left Leg**	☐ **Right Leg**
☐ **Left Ankle**	☐ **Right Ankle**	☐ **Left Foot**	☐ **Right Foot**	☐ **Other**	**Explain Below**
☐ **N/A**	**1st Aid/ Medical Treatment Received**	**Explain Below**	
Drug Screen Conducted?	☐ **Yes**	☐ **No**	☐ **N/A**	**Provide Notes Below**
Follow Up Required?	☐ **Yes**	☐ **No**	**Explain Below**
☐ **N/A**	**Controlling Contractor / Owner Name:**		
☐ **N/A**	**Location of the Incident (e.g. East Hallway, Second Floor, Northside Office, etc.)**		

☐ N/A	**Detailed Description of the Incident**

☐ N/A	**Description of the Root Cause**

☐ N/A	**Measures to Prevent Reoccurrence**

☐ N/A	**Witnesses**				
Name:		**Phone:**		**Company:**	
Name:		**Phone:**		**Company:**	
Name:		**Phone:**		**Company:**	

☐ N/A	**What Personal Protective Equipment was the injured/ involved personnel wearing?**			
☐ **Hardhat**	☐ **Safety Glasses**	☐ **Work Boots**	☐ **Work Gloves**	☐ **Safety Vest**
☐ **Other P.P.E.**	**Explain:**			

Pictured Recorded	☐ **Yes**	☐ **No**	☐ **N/A**	**Provide Picture Description Below.**

Additional Information

Signature of the individual completing this report:			
Contact	**Phone:**	**Email:**	

Personnel Statement Form

Statement Summary

Contact your supervisor Immediately. Complete this form after a safety incident has occurred. Submit to the Safety Department or Human Resources with the incident investigation report upon completion.			
Company:		**Supervisor:**	
Location:		**Date:**	
Relation to the Incident			
☐ **Witness**	☐ **Injured**	☐ **Involved**	☐ **Other:**
Name, Contact & Company Information			
Name:		**Phone:**	
Company:		**Title:**	
Controlling/ General Contractor			
Date of the Incident:		**Time of Incident:**	
Location of the Incident:			
Description of the Incident			
☐ **N/A**	**What PPE was the affected Employee Wearing?**		
☐ **N/A**	**Additional Information**		
Signature of the individual completing this form:			

FLEX-ERECT

SECTION 4

SUBJECT: General First Aid Treatment Safety Program

REGULATORY STANDARDS: 29 CFR 1926 Subpart C 1926.23, Subpart D 1926.50, 1910 Subpart K 1910.151 & 1910.1030 Bloodborne Pathogens

GENERAL: Flex-Erect attempts to ensure that jobs having a potential for employee injury within our facility(s) are evaluated and controlled. This Program is intended to address the requirement of having medical equipment on site and personnel trained in first aid. The goal is to treat minor wounds, stabilize the patient for transport to a medical facility, or to return the patient to work, and to do these in the safest, most efficient manner possible.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

Section	Contents of General First Aid Treatment Safety Program	Page
1	Written Program	2
2	Responsibilities and Authority	2
3	General Information	2
4	Policy and Procedures	2
5	First Aid Treatment	2
6	Definitions	5

GENERAL FIRST AID TREATMENT PROGRAM

1. Written Program.

The purpose of this policy and procedure is to provide all employees with the basic expectations of proper first aid treatment. This treatment should be done by any employee, should the occasion arise where the need may be necessary (Only in the event of an emergency). Trained first aid/medical responders shall be made available for consultation at all locations and identified as to their skills for such services to assist and take over in a crisis situation and treat simply medical care.

2. Responsibilities and Authority.

It is the responsibility of all employees to render some form of aid should a person require first aid treatment or medical treatment. This aid can be as simple as calling for help, to actually rendering treatment. This is considered an incidental part of the employees work.

All medically trained employees are expected to respond when the need arises.

3. General Information:

Proper first aid treatment will enable you to help someone in need, or to treat yourself more effectively until professional medical assistance is available. First aid, however, is not intended to take the place of medical attention or to eliminate the necessity of reporting injuries or illnesses, but to provide a general guideline that can be used immediately until professional medical assistance is available. Immediate treatment can mean the difference between a minor injury and a tragedy.

4. Policy and Procedure:

In the absence of medical assistance that is reasonably accessible in terms of time and distance to the worksite, a person who has a valid certificate in first aid shall be available to render first aid.

Our personnel shall obtain a valid certificate in first aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence?

First aid supplies shall be available easily accessible when required. The first aid kits shall consist of appropriate items determined to be adequate for the environment in which they will be used. The contents of first aid kits shall be periodically assessed to ensure the availability of adequate first aid supplies

5. First Aid Treatment:

Report all injuries and/or illnesses to the SHE Department as soon as possible. All reports must be in by the end of the working shift. Always survey the scene first, and use appropriate personal protective equipment where necessary. Always be aware of the potential for bloodborne pathogens to be present.

Chemical Splash

On The Body - acids, caustics, corrosive or toxic materials that come in contact with the body must be washed off immediately. Remove any contaminated clothing and wash the affected area with copious amounts of water for AT LEAST FIFTEEN MINUTES. Safety showers are located throughout the complex for this purpose.

In The Eyes - the necessity for immediate treatment of chemical splashes in the eyes cannot be overemphasized. The first few seconds are critical, especially where corrosive materials are concerned. Flush both eyes with large quantities of water for AT LEAST FIFTEEN MINUTES. Hold the eyelids open and roll the eyes to ensure the entire eye has been thoroughly flushed. NEVER try to neutralize an acid or caustic splash.

An individual who has received a chemical splash in the eyes may be temporarily blinded, in extreme pain, and hard to help. Do not hesitate to use enough force to provide the necessary help. Get professional medical help as quickly as possible.

Thermal Burns - in general, care for thermal burns are as follows:

For first-degree burns and second-degree burns with no open blisters, flush with lots of cool running water; apply moist dressing and bandage loosely.

For second-degree burns with open blisters and third-degree burns, apply dry dressing and bandage loosely. Do Not use water, as it increases the risk of shock. Seek medical attention immediately. Do Not use creams, ointments or salves unless prescribed by a doctor.

Wounds

Any break in the skin is a wound. It may be anything from a minor abrasion to a serious cut. Even the least serious of these, should have proper care as soon as possible.

Bleeding Wounds - such as cuts from broken glass, metal edges, etc., require treatment by a trained responder, but bleeding should be controlled on the spot. This can usually be done by holding a clean cloth over the wound (direct pressure) until clotting provides a natural barrier. For more serious bleeding wounds, get professional assistance as soon as possible and continue to maintain direct pressure on the wound until assistance arrives.

Puncture Wounds - bleed little, if at all, and there may be a temptation to ignore them. Because they do not bleed, they are more likely to become infected. Many cases of tetanus develop from puncture wounds which have been ignored or neglected. Be sure to get prompt medical attention for all puncture wounds.

Abrasions - abrasions should be cleaned with soap and water and covered with a sterile dressing to avoid infection.

Fractures

Any broken bone is a fracture - a leg, an arm and even a finger. Whenever a fracture of any bone larger than a finger is suspected, keep the victim lying down and as comfortable as possible until qualified medical help arrives. Moving a person without proper splinting is likely to cause additional damage, perhaps even permanent disability.

If it is absolutely necessary to move an injured person because of fire or other imminent hazard, pull him along the axis of the body, preferably by the feet.

Asphyxia, Suffocation, Respiratory Arrest

If breathing stops, life will be sustained for only a short period of time. However, many lives can be saved by some means of artificial respiration. If a person is not breathing, mouth-to-mouth resuscitation (rescue breathing) should be started immediately. Remove false teeth, chewing gum,

Asphyxia, Suffocation, Respiratory Arrest cont.

or any other material from the interior of the victim's mouth, tilt the head sharply and begin mouth-to-mouth resuscitation at once.

Electrical Shock

Most electrocution deaths are caused by 115-volt current. Electric current coursing through the body can stop a person's breathing and/or heart action. The victim may have fallen out of contact with the power source, in which case first aid can begin immediately. If not, the first step is to shut off the power or to pull the victim out of connect with the circuit, using some non-conductive implement such as a dry wooden pole, a rope or length of cloth.

If breathing has stopped, start rescue breathing immediately and send for medical help. Continue rescue breathing until the victim begins breathing on their own, or until instructed otherwise by medical personnel. If heart action has stopped, get medical help immediately. Electrical burns should be treated the same as thermal burns.

Shock

Shock in the medical sense of the word is a condition in which all the activities of the body are greatly depressed. It frequently occurs after any injury, either immediately or as a delayed reaction. Prevention and treatment are the same. Always assume that anyone who is seriously injured is in shock or will be shortly. The victim going into shock will usually turn pale from weak heart action, his breathing will be feeble and he may appear withdrawn, sleepy or even ignorant.

After a serious injury or when there are any symptoms of shock, keep the victim lying flat, with NO pillow or support under the victim's head. Wrap or cover him with blankets or any available garments to keep him warm until medical help arrives. If there are no fractures or serious injuries to the head or chest, raise his feet 8-12 inches to increase blood flow to the brain.

PROCEDURE FOR MEDICAL CARE FOR INJURED EMPLOYEES:

Critically Injured Employees

The injured employee should be taken to the nearest Emergency Room identified in the Pre-Job Safety Plan. In most cases an ambulance may need to be summoned. If the attending medic deems it necessary a request for Life Flight Service may be needed. Should this be the case the injured will be taken to an appropriate hospital that services life flight services.

All Other Cases

The employee will be transported to the nearest pre-designated medical facilities.

Guidelines for obtaining Medical Care

First Aid must be prompt and appropriate;

First Aid must be satisfactorily accomplished so that safe transportation of the patient may be made. A First Aid trained individual will accompany the injured to the Hospital/Industrial Clinic. It may be necessary, in many cases, to continue First Aid enroute. This will require the need of an ambulance.

A First Aid Trained individual in charge should designate a responsible and knowledgeable person remaining at the site/facility to:

Notify the Hospital Emergency Room or Industrial Clinic that an injured employee is enroute;

All Other Cases cont.

Give to a nurse or ER Technician details of the injury, type of injury, material involved and anticipated time of arrival of patient at Hospital/Clinic.;

Give patient's name, caller's name and telephone number in case ER personnel need to call back for information. The caller, or an informed substitute, should make himself available by phone where he has immediate access to Safety Data Sheets until he is aware that appropriate care is being given and that there is no longer any need for information about the accident or information from the Safety Data Sheet.

6. Definitions:

Bloodborne Pathogens - means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Cardiac Arrest - any number of conditions which result in the stoppage of all heart activity. This is considered a medical emergency.

E.R. - a common acronym for a hospital "Emergency Room."

First Aid - is any one-time treatment, and any follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care. Such one-time treatment, and follow-up visit for the purpose of observation, is considered first aid even though provided by a physician or registered professional personnel.

Illness (Occupational) - any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact.

Injury (Occupational) - any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from a single instantaneous exposure in the work environment.

Life Flight - A helicopter transport system, for medical cases only, offered by Hermann Hospital, downtown Houston.

Medical Treatment - injuries for which this type of treatment is provided or should be provided are almost always recordable:

1. Treatment of infection;
2. Application of antiseptics during second or subsequent visits;
3. Treatment of second or third degree burns;
4. Application of sutures, butterfly adhesives or steri-strips;
5. Removal of foreign bodies from wound;
6. Prescription medication (except as a single dose);
7. Hot or cold soaking therapy during second or subsequent visits;
8. Hot or cold compresses during second or subsequent visits;
9. Cutting away dead skin (necrotic debridement);
10. Heat therapy during second or subsequent visits;
11. Whirlpool bath therapy during second or subsequent visits;
12. Positive x-ray diagnosis;
13. Admission to a hospital for treatment.

SDS - An acronym for Safety Data Sheets

Recordable - Any occupational injuries or illnesses which result in:

1. Fatalities, regardless of the time between the injury and death, or the length of the illness; or
2. Lost workday cases other than fatalities, that result in lost workdays; or

3. Non-fatal cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment (other than first aid) or involve: loss of consciousness, or restriction of work, or motion. This category also includes any diagnosed occupational illnesses which are reported to the employer but are not classified as fatalities or lost workday cases.

Respiratory Arrest - Any number of conditions which result in the stoppage of any breathing activity. This is considered a sever medical emergency.

Trained Responder - A person who is certified and trained in standard first aid: Emergency Care Attendant, Emergency Medical Technician, or any advanced form of medical training that can respond to an emergency and render proper aid.

During the meeting the Safety Director or designee will determined if the individual can effectively (subjective) understand and communicate safety information as it is presented.

FLEX-ERECT

SECTION 5

SUBJECT: Bloodborne Pathogens Safety Program

REGULATORY STANDARDS: OSHA 29 CFR 1910.1030

GENERAL: Flex-Erect will ensure that the hazards associated with exposures to blood or other potentially infectious materials are evaluated and that information concerning their hazards is transmitted to all employees. This Program is intended to address the issues of evaluating these potential hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

Section	Contents of the Bloodborne Pathogens Safety Program	Page
1	Written Program	2
2	Training Requirements	2
3	Exposure Determination	3
4	Engineering and Work Practice Controls	3
5	Hand washing Facilities.	3
6	Universal Precautions	3
7	Personal Protective Equipment	4
8	Recordkeeping	5
9	Hepatitis B Vaccination Program	5
10	Post-Exposure Evaluation and Follow-Up	5
11	Labels and Signs	7
12	Definitions	7
13	Forms	9

BLOODBORNE PATHOGEN SAFETY PROGRAM

1. Written Program.

These guidelines provide safe practices to protect employees of FLEX-ERECT L.L.C. from the contraction of disease resulting from contacting blood or other potentially infectious materials (OPIM) during the course of work. FLEX-ERECT L.L.C. will review and evaluate this program periodically, and when changes occur to the regulations, when operational changes occur that require a revision of this document, or when there is an accident or near miss that relates to this area of safety. ENVIRONMENTAL SERVICES INC. personnel will have access to our exposure controls plans established for our specific work areas.

2. Training Requirements.

All employees of FLEX-ERECT L.L.C. designated as 1st Aid Responders or employees that may assist with minor 1st Aids will receive basic awareness training to ensure they can recognize the hazards of Bloodborne Pathogens. In addition, employees whose initial assignment to tasks where occupational exposure to bloodborne pathogens is likely to occur, must be trained at the time of initial assignment and every year thereafter.

2.1 Training will include:

- 2.1.1 The standard and its contents. FLEX-ERECT L.L.C. Bloodborne Pathogen Safety Program and methods for obtaining a copy.
- 2.1.2 The epidemiology and symptoms of Bloodborne diseases.
- 2.1.3 The modes of transmission of Bloodborne pathogens.
- 2.1.4 The recognition of tasks that may involve exposure.
- 2.1.5 The use and limitations of methods to reduce exposure, for example engineering controls, work practices and personal protective equipment (PPE).
- 2.1.6 The types, basis of selection, use, location, removal, handling, decontamination, and disposal of PPE.
- 2.1.7 The Hepatitis B vaccination, including efficacy, safety, method of administration, benefits, and that it will be offered free of charge.
- 2.1.8 What appropriate actions to take and persons to contact in an emergency involving blood or OPIM.
- 2.1.9 The procedure to follow if an exposure incident occurs, including the method of reporting and medical follow-up.
- 2.1.10 The evaluation and follow-up required after an employee exposure incident.
- 2.1.11 The signs, labels, and color-coding systems.

2.2 Additional training is provided to employees when there are any changes of tasks or procedures affecting the employees' occupational exposure.

3. Exposure Determination.

FLEX-ERECT L.L.C. Inc. has not determined any jobs, tasks, or employees with a high likelihood to have occupational exposure to blood or OPIM. This exposure determination is made without regard to the use of personal protective equipment (i.e., employees are considered to be exposed even if they wear personal protective equipment). In the event that employees are designated as having a high likelihood of occupational exposure to blood or OPIM the guidelines detailed in this program will be followed and the Safety Manager will ensure that all aspects of this program are enforced.

4. Engineering and Work Practice Controls.

Engineering and work practice controls will be used to eliminate or minimize exposure to employees at this company. Where occupational exposure remains after institution of these controls, employees are required to wear personal protective equipment. At this company the following engineering controls are used:

4.1 Placing sharp items (e.g., needles, broken glass, sharp debris, etc.) in puncture-resistant, leak proof, labeled containers.

4.2 Removing soiled, or contaminated PPE as soon as possible.

4.3 Cleaning and disinfecting all equipment and work surfaces potentially contaminated with blood or OPIM. **Note**: We use a solution of I/4 cup chlorine bleach per gallon of water.

4.4 Thorough hand washing with soap and water immediately after providing care or provision of antiseptic towelettes or hand cleanser where hand washing facilities are not available.

4.5 Prohibition of eating, drinking, smoking, applying cosmetics, handling contact lenses, and so on in work areas where exposure to infectious materials may occur.

5. Hand washing Facilities.

Hand washing facilities are available to employees who have exposure to blood or OPIM. Sinks for washing hands after occupational exposure are near locations where exposure to bloodbome pathogens could occur.

5.1 When circumstances require hand washing and facilities are not available, either an antiseptic cleanser and paper towels or antiseptic toilettes are provided. Employees must then wash their hands with soap and water as soon as possible.

5.2 Supervisors must make sure that employees wash their hands and any other contaminated skin after immediately removing personal protective gloves, or as soon as feasible with soap and water.

6. Universal Precautions.

The following symbol is the universal biohazard symbol. When this symbol is affixed to anything, it should be understood by all to take the appropriate precautions to prevent exposure to potential bloodborne pathogens when handling that object. It must be used on/in all areas where there may exist the potential for exposure.



We treat all human blood and body fluids as if they are known to be infectious for HBV, HIV and other bloodborne pathogens.

In circumstances where it is difficult or impossible to differentiate between body fluid types, we assume all body fluids to be potentially infectious.

The Exposure Control Officer is responsible for overseeing our Universal Precautions Program.

7. Personal Protective Equipment.

All PPE used at this facility is provided without cost to employees. PPE for employees designated as having a high likelihood of occupation exposure to blood or OPIM is chosen based on the anticipated exposure. The protective equipment is considered appropriate only if it does not permit blood or OPIM to pass through or reach the employees' clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time, which the protective equipment will be used.

7.1 Employees must remove all garments, which are penetrated by blood immediately or as soon as possible.

7.2 They must remove all PPE before leaving the work area. When PPE is removed, employees place it in a designated container for disposal, storage, washing, or decontamination.

7.3 Gloves. Employees must wear gloves when they anticipate hand contact with blood, OPIM, non-intact skin, and mucous membranes when handling or touching contaminated items or surfaces.

7.3.1 Disposable gloves used at this facility are not to be washed or decontaminated for re-use and are to be replaced as soon as practical when they become contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

7.3.2 Utility gloves may be decontaminated for re-use provided that the integrity of the glove is not compromised.

7.4 Other signs of deterioration or when their ability to function as a barrier is compromised.

7.5 Hypoallergenic gloves, glove liners, powerless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

7.6 Eye and Face Shields. Employees must wear masks in combination with eye protective devices, such as goggles or glasses with solid side shield, or chin length face shields, whenever splashes, splatter, or droplets of blood or OPIM may be generated and reasonably anticipated to contaminate eye, nose, or mouth.

8. Recordkeeping.

Training records shall be maintained for three years from the date of training. Medical records shall be maintained in accordance with OSHA Standard 29 CFR 1910.20. These records shall be kept confidential, and must be maintained for at least the duration of employment plus 30 years. The records shall include the following:

8.1 The name and social security number of the employee.

8.2 A copy of the employee's HBV vaccination status, including the dates of vaccination.

8.3 A copy of all results of examinations, medical testing, and follow-up procedures.

8.4 A copy of the information provided to the healthcare professional, including a description of the employee's duties as they relate to the exposure incident, and documentation of the routes of exposure and circumstances of the exposure.

8.5 Availability. All employee records shall be made available to the employee in accordance with 29 CFR 1910.20. All employee records shall be made available to the Assistant Secretary of Labor for the Occupational Safety and Health Administration and the Director of the National Institute for Occupational Safety and Health upon request.

9. Hepatitis B Vaccination Program.

FLEX-ERECT L.L.C. offers the Hepatitis B vaccine and vaccination series to all employees who have occupational exposure to Bloodborne pathogens, and post exposure follow-up to employees who have had an exposure incident.

9.1 Participation in a pre-screening program is not a prerequisite for receiving Hepatitis B vaccination. If the employee initially declines Hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the vaccination will be made available. All employees who decline the Hepatitis B vaccination offered must sign the OSHA-required waiver indicating their refusal.

9.2 If a routine booster dose of Hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster doses will be made available.

10. Post-Exposure Evaluation and Follow-Up.

All exposure incidents are reported, investigated, and documented. When the employee is exposed to blood or OPIM, the incident is reported to the Safety Manager. When an employee is exposed, he or she will receive a confidential medical evaluation and follow-up, including at least the following elements:

10.1.1 Documentation of the route of exposure, and the circumstances under which the exposure-occurred.

10.1.2 Identification and documentation of the source individual, unless it can be established that identification is infeasible or prohibited by state or local law.

10.1.3 The individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV or HIV, infectivity. If consent is not obtained, Management establishes that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, will be tested and the results documented.

10.1.4 When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

10.1.5 Results of the source individual's testing are made available to the exposed employee, and the employee is informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

10.2 Collection and testing of blood for HBV/HIV serological status will comply with the following:

10.2.1 The exposed employee's blood is collected as soon as possible and tested after consent is obtained.

10.2.2 The employee will be offered the option of having their blood collected for testing of the employee's HIV/HBV serological status. The blood sample will be preserved for up to 90 days to allow the employee to decide if the blood should be tested for HIV serological status.

10.3 All employees who incur an exposure incident will be offered post-exposure evaluation and follow-up according to the OSHA standard.

10.4 The healthcare professional responsible for the employees' Hepatitis b vaccination is provided with the following:

10.4.1 A copy of 29 CFR 1910.1030.

10.4.2 A written description of the exposed employee's duties as they relate to the exposure incident-

10.4.3 Written documentation of the route of exposure and circumstances under which exposure occurred.

10.4.4 Results of the source individual blood testing, if available.

10.4.5 All medical records relevant to the appropriate treatment of the employee including vaccination status.

10.5 FLEX-ERECT L.L.C. obtains and provides the employee with a copy of the evaluating healthcare professional’s written opinion within 15 days of the completion of the evaluation.

10.6 The healthcare professional's written opinion for HBV vaccination must be limited to whether HBV vaccination is indicated for an employee, and if the employee has received such vaccination.

10.7 The healthcare professional's written opinion for post-exposure follow-up is limited to the following information:

10.7.1 A statement that the employee has been informed of the results of the evaluation.

10.7.2 A statement that the employee has been told about any medical conditions resulting from exposure to blood or OPIM which require further evaluation or treatment.

- Note: All other findings or diagnosis shall remain confidential and will not be included in the written report**.**

11. Labels and Signs.

Biohazard labels are affixed to containers of regulated waste, refrigerators and freezers containing blood or OPIM, and other containers used to store, transport or ship blood or OPIM. The universal biohazard symbol is used. The label is fluorescent orange or orange-red. Red bags or containers may be substituted for labels. Blood products that have been released for transfusion or other clinical use are exempted from these labeling requirements.

12. Definitions.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.

Blood means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Engineering Controls means controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Handwashing Facilities means a facility providing an adequate supply of running potable water, soap, and single-use towels or air-drying machines.

Licensed Healthcare Professional is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV means hepatitis B virus.

HIV means human immunodeficiency virus.

Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials. *Sterilize* means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

13. Forms

#	Form Name	Page #
1	HEPATITIS B VACCINE DECLINATION FORM (MANDATORY)	10

HEPATITIS B VACCINE DECLINATION FORM (MANDATORY)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease.

If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

EMPLOYEE NAME (Please Print)

Last 4 Digits of SSN

Employee Signature | Date

Supervisor / Trainer Signature | Date

FLEX-ERECT

SECTION 6

SUBJECT: Stressful Environmental Conditions Safety Program

REGULATORY STANDARD: Occupational Safety and Health Act (OSHA) of 1970 General Duty Clause, Section 5(a)(1)

GENERAL This program is intended to provide employees with the information they need to assess, monitor, and make determinations about Environmental Conditions which could affect their safety and long-term health if not followed properly. Environmental Conditions can change rapidly – it is paramount that employees continually monitor the working conditions to prevent being caught off-guard.

RESPONSIBILITY: The Safety Manager is the program administrator, acting as the representative of the company owners, who have the ultimate responsibility for all facets of this program. The Safety Manager has full authority to make necessary decisions to ensure success of the program. Supervisors are required to be familiar with the contents of this program, and will ensure the program is followed by their subordinates on a daily basis. Supervisors will ensure that respirators are only used when approved by the Safety Manager and in accordance with this Program. Supervisors will also ensure that employees who desire to wear respirators on a voluntary basis are provided with the proper information in accordance with the guidelines of this program.

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STRESSFUL ENVIRONMENTAL CONDITIONS SAFETY PROGRAM

1. Written Program.

Heat is internally generated by the body's own functioning and increases as workload increases. Environmental heat can add to the body's burden of heat removal and includes air temperature, air velocity, humidity, and radiant heat. Working in a hot environment can pose special hazards to the health and safety of employees, including heat-related illness and fatigue. Heat increases the potential for accidents due to fogged glasses, sweat in the eyes, slippery hands, physical discomfort, irritability, reduced judgment, or slower physical and mental reaction times.

Although cold stress is generally less of a hazard in some States than heat stress, it has the potential to cause serious injury or even death. Cold stress can result in frozen skin, a lowering of the normal body temperature, or both. Cold and icy weather also increases the frequency of injuries from slips and falls.

The Occupational Safety and Health Administration (OSHA) does not have a specific rule for general exposures to heat stress, but enforces control of exposure to heat through the General Duty Clause of the Occupational Safety and Health Act of 1970. The General Duty Clause states that:

"Each employer shall furnish to each of his employee's employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

The OSHA Technical Manual, which serves as a guidance document for OSHA compliance officers, discusses evaluation and control of hot working environments through the Wet Bulb Globe Temperature (WBGT) Threshold Limit Value (TLV) as the primary index of heat stress and is the basis for heat stress controls. The WBGT is determined by a formula that integrates measurements of humidity, air movement, radiant temperature and air temperature. The recommended WBGTTLV correlates work load and recommended work/rest schedules to control exposure to employees from the heat. OSHA recognizes that adjustments for specific individuals or situations may be necessary (Appendix A contains heat stress calculations and tables).

2. Specific Responsibilities.

2.1 **Safety Manager.** The Safety Manager is responsible to ensure that the Flex-Erect Stressful Environmental Safety Program is specific and applicable to all job sites. In addition, the Safety Manger will change, amend, and update this program as necessary when.

2.2 **Supervisors.** Supervisors shall ensure that plenty of potable water is available to employees exposed to heat stress.

1. Ensuring that training has been provided and all employees know the location of the potable water.
2. Assessing the day-to-day heat or cold stresses on employees.
3. Identifying employees with potential exposure to heat or cold stress
4. Assessing work load and assigning work/rest schedules, if needed.
5. Report any heat/ cold related injuries/ illnesses to the safety manager.

2.3 **Employees.** Employees shall perform their work in a safe manner according to the training they receive.

1. Arrive on site hydrated and fit to work.
2. Know the location of the potable water.
3. Take routine rest breaks as needed.
4. Drink plenty of water throughout the work shift.
5. Report any heat/ cold related injuries/ illnesses to the supervisor.

3. Training Requirements.

3.1 **General.** Flex-Erect will provide training to its employees regarding heat/cold stress. The training will include:

1. Assessing and determining exposure risk to potentially harmful heat or cold stress.
2. Continually monitoring heat and cold stress environments.
3. Determining best practices to avoid heat and cold stress.
4. Using the contents of this policy to assist in determining the best practice to use
5. Report any heat/ cold related injuries/ illnesses to the supervisor.

3.2 **Retraining.** Post incident retraining will take place before an employee is released for regular work duties and or if any modifications to this policy have been made.

4. Understanding Risks, Recognizing & Treating Heat Related Disorders.

Four environmental factors affect the amount of stress a person faces in a hot environment - temperature, humidity, radiant heat (such as from the sun or a furnace) and air velocity.

The level of heat stress a person experiences is also related to personal characteristics such as age, weight, medical condition, and acclimatization to the heat.

Risk may increase if a person is:

- chronically ill
- over 40
- returning to work from vacation
- overweight or in poor physical condition
- on a severely restricted diet
- recovering from a recent illness, including a heat related illness
- dehydrated
- living in high temperatures at night (no recovery time)
- experiencing a fever

Other personal factors that increase a persons' risk of heat stress include:

- consumption of alcohol (within 24 hours)
- consumption of caffeinated and sugary drinks
- use of medications for:
- high blood pressure
- diuretics
- antidepressants

- tranquilizers
- antihistamines (allergy and cold medications)
- recent illnesses
- recent vaccinations
- skin trauma, including sunburn

In general, the body reacts to hot environments as follows. When the blood temperature rises above 98.6EF, blood flow to skin increases to transfer heat to outside air through convection, radiation, evaporation, and conduction; and sweating occurs so its evaporation will cool skin, but reaches maximum efficiency at 86EF. Sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids lost is adequately replaced.

If the body cannot dispose of excess heat, it will store it. When this happens, the body's core temperature begins to rise and the heart rate increases. Because so much blood goes to the external skin surface, less blood is supplied to the active muscles. Strength declines and the onset of fatigue comes quicker and results in reduced accuracy, comprehension, and retention. As the body continues to store heat, the individual begins to lose concentration and has difficulty focusing on a task, may become irritable and loses the desire to drink. The next stage is most often fainting and then possibly death if the person is not removed from the heat.

A. Heat Disorders

There are five major categories of heat related illness: heat stroke, heat exhaustion, heat cramps, heat syncope (fainting), and heat rash (prickly heat). After experiencing a heat-related illness, the victim will be more susceptible to heat stress than before being affected. The symptoms and treatment of each is discussed below.

1) **Heat Stroke**

Heat stroke is the most serious heat related illness. It is always life threatening because a person's temperature is so high it might cause brain damage or organ failure. It is caused by the failure of body's temperature regulating mechanisms and dehydration.

a) **Symptoms**

- hot, dry skin (may be mottled, red or bluish)
- core temperature over 105EF
- mental confusion, loss of consciousness
- convulsions or coma

b) **Treatment**

- Call for help immediately. Prompt first aid can prevent permanent injury to the brain and other vital organs.
- Remove the victim from heat and/or sun.
- Immediately cool victim with ice packs, cool water, cool compresses, (but never put ice directly on the skin).
- Do not give the victim anything to drink, especially not tea, coffee, or alcoholic beverages. Never give anything by mouth to someone who is unconscious.

2) **Heat Exhaustion**

Heat exhaustion is caused by the loss of body fluid and salt from sweating, decreased blood circulation to the brain and organs, or both. It is caused when a person does not take in enough water, salt, or both. It is less serious than heat stroke, but can become serious and lead to heat stroke if not treated.

a) **Symptoms**

- clammy, pale or flushed moist skin
- extreme fatigue, headache, nausea
- rapid pulse and low blood pressure
- oral temperature that is normal or slightly elevated

b) **Treatment**

Remove the victim to a cooler area and give them water as they desire (but never any liquids with caffeine or alcohol). “Sports” drinks may be consumed if desired, or slightly salted water (only if not on a restricted diet). “Slightly salted” means 1/4 teaspoon of salt per gallon of water.

- Have the victim rest with their feet slightly elevated
- Cool the body with ice packs or cool water if needed
- Call the appropriate emergency response number if the victim becomes unconscious
- Some cases of heat exhaustion may take several days or longer for full recovery and the person is at higher risk of heat stroke after experiencing heat exhaustion.

3) **Heat Cramps**

Heat cramps are painful spasms of the working muscles of workers who are drinking large quantities of water, but have some salt depletion. The cramps may occur during or after working hours and are usually relieved by drinking lightly salted water.

a) **Symptoms**

- painful spasms of muscles used during work (usually arms, legs, or abdomen)

b) **Treatment**

- Drink lightly salted water or “sports” drinks (unless on medical restriction)
- Use adequate salt amount during meals

4) **Fainting or Heat Syncope**

Syncope may occur in workers who are not acclimated and stand still in the heat. Blood normally circulated to the heart and brain is sent to the skin for cooling, and pools in the enlarged blood vessels in the skin and in the lower part of the body. It may be prevented by moving around, assuming no other complications occur.

a) **Symptoms**

- fainting or becoming dizzy while standing in the heat

b) **Treatment**

- Remove the victim to a cooler area and let them drink water
- Recovery should be prompt
- Consult a physician if the condition persists

5) **Heat Rash**

Heat rash can be avoided by resting in a cool place and allowing the skin to dry. Wearing layers of thin cotton clothing that do not tightly bind the skin especially near the waist or the arms will allow sweat to evaporate.

a) **Symptoms**

- "Prickly heat" or “miliaria” may occur in humid environments where sweat is not easily removed from the skin by evaporation. The sweat ducts become plugged, become inflamed, and a rash develops. Infection is a possibility. When extensive or complicated by infection, heat rash can be so uncomfortable that is impedes a person’s performance or even results in a total temporary disability.

b) **Treatment**

- Cool and dry the skin and avoid conditions that cause sweating. If infection develops, have it treated by a physician.

B. Preventing Heat Related Illnesses

1) **Acclimatization**

Acclimation is a process by which the physiological processes of a worker’s body adjusts to the environment over a period of time, usually 5 to 7 days according to OSHA. However, the process may take up to three weeks depending on the individual and his/her work environment. According to the American Industrial Hygiene Association, the process requires a consistent work level for at least two hours each day during the acclimation period in order for a worker to become acclimatized. Mere exposure to heat does not confer acclimatization, nor does acclimatization at one heat stress level confer resistance to heat stress at a higher temperature or more vigorous work load. The allowable WBGT-TLV exposure for un-acclimatized workers is several degrees lower than that of someone who is fully acclimatized. Because their exposure to heat and their workloads may be inconsistent, some personnel may not, by definition, be acclimated to the heat they encounter in their shops. People who are not sufficiently acclimatized to the heat may experience transient heat fatigue resulting in a decline in performance, coordination or alertness. They may also become irritable or depressed. This can be prevented through gradual adjustment to the hot environment. People in good physical condition tend to acclimatize better because their cardiovascular systems respond better.

Allow the body to adjust to the hot environment. Sweat will increase, but salt loss will decrease. On the first day in a hot environment, a person should perform about 50% of the normal workload. The workload in the hot environment should be increased by 10% each day on each succeeding day. Full acclimatization takes about two weeks. It is the supervisor’s responsibility to extend rest periods according to individual requirements and to allow a re-acclimatization period after an absence from work of a week or more or if the person is returning to work from an illness.

2) **Hydration**

Dehydration is a major factor in most heat disorders. The average body loses approximately 2½ quarts of sweat a day. When performing strenuous work, the body can lose up to 1½ quarts of sweat per hour. It is essential to drink more than is needed to satisfy thirst. It is necessary to drink 10-12 ounces of water every 20-30 minutes for heavy sweating.

3) **Salt Replacement**

Sweat not only contains water, but salt and other electrolytes. The body needs a certain amount of salt to function properly, but salt tablets are not recommended because of stomach irritation,

nausea, and vomiting. Employees should drink normal water throughout day, but may drink an electrolyte solution such as Gatorade after working in a hot environment, if desired. Individuals on a salt restricted diet or those persons being treated for high blood pressure or heart problems must NOT try to replace salt without the advice of their physician.

4) **Safe Work Practices**

- Watch out for the safety of coworkers
- Take scheduled breaks in cool areas
- Take water breaks as needed
- Drink plenty of cool water
- Report trouble to a supervisor
- Supervisors should consider scheduling the hottest work for the coolest part of day, assigning extra workers to high demand tasks, and using a wide variety of work-saving devices such as power tools, hoists, cranes, or other lifting aids to reduce the body's work load

5) **Recommended Protective Clothing**

Loose fitting clothes made of light cotton allow sweat to evaporate and transfer heat better than tight fitting synthetic fibers. Wear a hat to shade the head.

6) **Things to AVOID**

The following should be avoided while working in hot environments:

- all alcoholic beverages
- diuretics, or water pills
- hot, heavy meals
- sugary drinks
- a severely restricted diet

5. Understanding Risks, Recognizing & Treating Cold Related Disorders.

Cold injuries are classified as either localized (such as frostnip, frostbite), or generalized as in hypothermia (a lowering of the body's core temperature).

A. Cold Disorders

1) **Hypothermia**

Hypothermia occurs when the body cannot maintain a normal core temperature of 98.6EF to 99.6EF. Hypothermia can take a victim by surprise since it can occur above freezing.

Wind, physical exhaustion, and wet clothing all make a person more prone to hypothermia.

Air temperature alone is not enough to judge the cold hazard of an environment. Most cases of hypothermia develop in an air temperature of 36 to 50EF. However, wind chill is a significant factor: a 50EF day with a 20 mph wind feels like 0EF (see ACGIH Table 2 of Appendix B for wind chill factors).

a) **Symptoms**

- numbness, stiffness or pain (especially in the neck, arms, and legs)
- poor coordination, slurred speech and drowsiness
- slow, irregular breathing and heart beat/pulse
- puffiness in the face

- low blood pressure
- listlessness, confusion and disorientation, (it is not unusual to see someone who makes little or no effort to get out of the cold or to keep warm)
- collapse or exhaustion after rest
- severe shivering
- death is a possibility

NOTE: During exposure to cold, severe shivering develops when the body temperature has fallen to 95EF. This must be taken as sign of extreme danger to workers and exposure to cold should be immediately terminated for any workers when any severe shivering becomes evident. Useful physical or mental work is extremely limited when severe shivering occurs. The severe shaking of muscles is caused by bursts of energy from the body and changes in blood chemistry.

b) **Treatment**

Unconscious persons with severe hypothermia should be treated aggressively by experienced medical personnel and transported to a hospital. If no pulse is detected, CPR should be administered immediately until help arrives.

- Get the person out of frozen, wet or tight clothes
- Mild hypothermia in young and otherwise healthy persons can be treated by rewarming the person in a warm bed or bath with warm packs, warm dry clothes, or blankets
- Elderly or debilitated victims may be treated by using an electric blanket
- Have the victim drink something warm (if conscious), but do not give caffeine or alcohol. (NEVER give anything by mouth to someone who is unconscious.)

2) **Frostnip**

Frostnip occurs when the face or extremities are exposed to cold wind which caused the skin to turn white.

a) **Symptoms:**

- firm, cold, white areas on the face, ears, or extremities
- peeling or blistering that may appear similar to sunburn
- a mild hypersensitivity to cold persists

b) **Treatment:**

- The frost nipped area should be treated by rewarming the area with an unaffected hand or a warm object. Do not use hot water.

3) **Frostbite**

Frostbite occurs when there is freezing of the skin. It can occur without hypothermia when the extremities do not receive sufficient heat from central body stores because of inadequate clothing or circulation. The most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes. Damage from frostbite can be serious; scarring, tissue death, and amputation are all possible, as is permanent loss of movement in the affected parts.

Skin cannot freeze in an air temperature of 30EF or greater, but there is a danger of hypothermia. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly. If skin should come in contact with objects colder than freezing, frostbite may develop at the point of contact, even in a warm environment.

a) **Symptoms:**

- the area is cold, hard, white and anesthetic
- on warming, it becomes blotchy red, swollen and painful
- depending on the extent of the injury, the area may recover normally deteriorate to gangrene

b) **Treatment:**

- DO remove restrictive clothing or jewelry near the affected area or body part
- DO warm the frozen part and exercise it, but do not walk on frostbitten feet
- DO warm the frozen part quickly with sheets and blankets and warm water
- DO remove wet clothing from the affected area and gently dry the affected part
- DO place the affected part next to a warm part of the body if warm water is not available
- DO seek medical attention immediately
- DON'T rub the affected areas
- DON'T apply a heat lamp or very hot water bottle
- DON'T go near a hot stove
- DON'T break any blisters
- DON'T drink caffeine or alcohol to treat for hypothermia or frostbite
- DON'T rewarm the frozen tissue if tissue refreezing is a possibility
- DON'T use hot water (use warm water only)

4) **Chillblains**

Chillblains are caused by prolonged, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. When this affects the feet it is called "trench foot".

a) **Symptoms:**

- swelling, tingling, itching and severe pains
- Possibly blistering, tissue death and ulceration
- pale, clammy cold skin that is swollen and numb
- infection is likely
- sensitivity to temperature may persist for years

b) **Treatment**

- treatment for chillblains is the same as for frostbite

B. Preventing Cold Related Illnesses

1) **Acclimatization**

Workers exposed to the cold should be physically fit, without any circulatory, metabolic, or neurologic diseases that may place them at increased risk for hypothermia. A new employee should not be required to work in the cold full time during the first days of employment until they become

adjusted to the working conditions and required protective clothing. New workers should be introduced to the work schedule slowly and be trained accordingly.

2) **Hydration**

Working in the cold can cause a significant water loss through the skin and lungs as a result of the dryness of the air. Increased fluid intake is essential to prevent dehydration that can increase the risk of damage to the extremities since blood flow is decreased. Warm, sweet drinks (but not caffeinated) or soups should be consumed.

3) **Diet**

As with heat stress, consuming extra salt is not necessary. It is very important for persons who work in cold environments to eat a well-balanced diet. Workers should avoid smoking or drug or alcohol use since these can restrict circulation or cause heat loss.

4) **Safe Work Practices**

- Walk carefully on snowy and icy sidewalks
- If you shovel snow, be very careful to avoid overexertion. Keep relatively active, but not so active that you become damp with sweat
- Change out of wet clothing or socks as soon as possible
- Don't use unprotected metal chair seats or touch any cold objects with bare hands
- People who are taking certain medications, older, overweight, have allergies, smoke, or have poor circulation (diabetics, for example) are more prone to cold injuries and should take extra precautions
- DO NOT drink alcohol
- Avoid soaking of clothing or gloves with any liquids (especially gasoline, alcohol, or cleaning fluids) due to the added danger of evaporative cooling
- For work below -15EF, follow a work-rest schedule established by the EHSO (see ACGIH Table 3 of Appendix B for work/rest schedule for cold stress). Work/rest schedules take into account the expected wind velocity and air temperatures
- Always work under the buddy system if you must travel or work outdoors in dangerous conditions
- As much as possible, avoid using vibrating tools in very cold temperatures
- Wear UV protective eyewear if you must work outdoors in snow or ice-covered terrain
- If you have a pre-existing injury or if you are injured on the job during cold stress periods see your supervisor immediately. Injured tissues can be more susceptible to the cold.

5) Recommended Protective Clothing

- Below 40EF, wear adequate insulating, dry clothing to maintain body core temperatures above 98.6EF.
- Clothing should resist rain and wind but also allow water vapor generated by perspiration to escape.

- Do not wear constrictive garments. Instead, wear several layers of loose-fitting clothes that can be added or removed as needed to aid in evaporation of sweat.
- Suspenders may be used instead of belts which can constrict and reduce circulation.
- Thin cotton fabric is very good since it helps evaporate sweat. Wear cotton T-shirts and shorts under cotton or wool thermal underwear and wool or thermal trousers.
- Wear socks with high wool content and insulated boots. When two pairs of socks are worn, the inside pair should be smaller and made of cotton.
- Wear a hat. You lose up to 40 percent of your body heat through your head if it is not covered.
- Gloves should be worn below 40EF. Mittens should be used when the air temperature is 0EF or less.
- Wear a face mask and/or scarf if it is windy or extremely cold and cover your mouth to protect your lungs.

6. Ultraviolet Light Hazards

Sunlight, which contains ultraviolet radiation (UV), can be a hazard to eyes or skin. Unprotected employees working in sunlight risk exposure to UV radiation and skin cancer. The number of Melanoma skin cancer cases, which are the most serious type of skin cancer, is rapidly rising in the United States. Melanoma accounts for more than three-fourths of skin cancer-related deaths each year, though most skin cancers can be cured if detected early enough.

Risk factors for skin cancer include:

- work or spending extended time outdoors
- fair skin
- blonde, red, or light brown hair
- freckles or burn before tanning
- numerous, large, or irregular moles
- serious sunburns

In an effort to help the region's workers safeguard themselves against UV radiation the U.S. Labor Department's Occupational Safety and Health Administration suggests that workers take the following precautions when working outdoors:

A. Cover Up. Wear protective clothing that does not transmit visible light to protect as much of your skin as possible. To determine if a certain piece of clothing will protect you, place your hand between the fabric and a light source. If you can see your hand through the fabric, it offers little protection against sun exposure.

B. Frequently apply sunscreen. Use a sunscreen with a Sun Protection Factor (SPF) of 15 or higher. An SPF of 15 blocks out 93% of the burning UV rays; an SPF of 30 blocks out 97%. Products labeled “broad spectrum block both UVA and UVB radiation (both contribute to skin cancer risk). Apply sunscreen liberally at least 15 minutes before going outside. Reapply every 2 hours or more frequently if you sweat a lot or are swimming. Do not rely on sunscreen alone. Combine with other clothing and eye protection.

C. Wear a hat. Broad-brimmed hat is ideal because it protects the neck, ears, eyes, forehead, nose and scalp. A baseball cap does not protect the ears or neck where skin cancers frequently develop.

D. Wear sunglasses that block UV rays. UV-reflective sunglasses can help protect your eyes from sun damage. Ideal sunglasses do not have to be expensive to block 99 to 100 % of UVA and UVB radiation. Check the label to be sure they do. Darker glasses are not necessarily the best. UV protection comes from an invisible chemical applied to the lenses, not from the darkness or color of the lenses.

E. Limit sun exposure. UV is most intense when the sun is highest in the sky between 10 AM and 4 PM. If you are unsure about the sun's intensity, take this test: If your shadow is shorter than you, the sun's rays are the strongest. Seek shade whenever possible. Check the UV index in your area. The UV index is usually broadcast on TV or radio stations. The UV index rates the amount of UV radiation reaching the surface on a scale of 1 to 10+ and is forecast daily for 58 cities. The higher the number the greater the exposure to UV radiation. The Index helps to determine when to avoid sun and when to take extra protective measures.

F. Signs and Symptoms. Know the signs and symptoms of skin cancers and see a health-care clinician if an unusual skin change occurs. The most important warning sign for skin cancer is a spot that is changing in size, shape, or color over a period of 1 month to 1-2 years. The most common skin cancers –basal cell and squamous cell–often take the form of a pale, wax-like pearly nodule; a red scaly, sharply outlined patch; or a sore that does not heal. Melanoma often starts as a small mold-like growth.

FLEX-ERECT

SECTION 7

SUBJECT: Hearing Conservation Safety Program

REGULATORY STANDARD: OSHA - 29 CFR 1910 Subpart I & 1926 Subpart E

GENERAL: Flex-Erect attempts to ensure that employees of Flex-Erect have a work environment free from recognized noise hazards. Through the use of the Hearing Conservation program discussed below, employees of Flex-Erect will be provided with the opportunity to work at the company's jobsites and facilities without suffering from the adverse effects of noise exposure.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received training before assignment to work.

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HEARING CONSERVATION SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, or when operational changes occur that require a revision of this Hearing Conservation safety program.

2. Responsibility

Flex-Erect shall administer a continuing, effective hearing conservation program, as outlined in the policy/procedure below, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale slow response or, equivalently, a dose of fifty percent.

3. Hazard Assessment.

Job Hazard Assessment. Job hazard assessments will be performed by Supervisors at the beginning of new jobs. Supervisors will be trained to look for potential noise exposures.

4. Engineer Controls.

Flex-Erect understands that engineering solutions, where feasible, are the preferred method of control for noise hazards. This is accomplished whenever possible by redesigning the work station, work methods, or tool(s) to reduce the noise exposures of the job. The Safety Manager will, whenever possible, research into currently available controls and technology.

5. Administrative Controls.

Company administrative controls will be used to reduce the duration, frequency, and severity of exposures to noise hazards. An example of an administrative control is reducing the amount of noise exposure time per employee.

6. Training Requirements.

Flex-Erect will institute a hearing conservation and training program for all employees who are exposed to noise at or above 85 dB(A) TWA for 8 hours and shall ensure employee participation in such a program. The training program shall be repeated annually for each employee that will include a review of the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes. Flex-Erect will ensure that each employee is informed of the following: The effects of noise on hearing; the purpose of hearing protectors, and advantages, disadvantages, and attenuation of various types, and instruction on selection, fitting, use and care; and the purpose of audiometric testing with an explanation of the test procedures.

6.1 Refresher Training. Scheduled refresher training will be conducted periodically.

6.1.1 Retraining will be provided for all affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new noise hazard, or when their work takes them into other noise hazard areas.

6.1.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known noise hazards.

6.1.3 The retraining will reestablish employee proficiency and introduce new equipment, new lifting procedures or revised control methods and procedures, as necessary.

Flex-Erect will make available to affected employees or their representatives copies of the OSHA standard 1910.95 and will also post a copy in the workplace. Flex-Erect will provide to affected employees any informational materials pertaining to this standard that are supplied by OSHA. Flex-Erect will provide, upon request, all materials related to the employees' training and education program to OSHA.

7. Policy and Procedures.

Flex-Erect will administer a continuing, effective hearing conservation program, whenever employee noise exposures equal or exceed an 8-hour time weighted average sound level (TWA) of 85 decibels (DB).

Monitoring

All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels will be integrated into the noise measurements. Monitoring will be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that additional employees may be exposed at or above the action level; or the attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the OSHA requirements.

Employee Notification

Flex-Erect will notify each employee exposed at or above an 8-hour TWA of 85 dB(A) of the results of the monitoring. Employees will be given the opportunity to observe any noise measurements conducted.

Audiometric Testing Program

Flex-Erect will establish and maintain an audio metric testing program by making audio metric testing available to all employees whose exposures equal or exceed 8 hour TWA of 85 dB(A). Audio metric tests will be performed by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, (or equivalent) and responsible to a physician.

Baseline Audiogram

Within six months of an employee's first exposure at or above the action level, Flex-Erect will establish a valid baseline audiogram against which subsequent audiograms can be compared. Testing to establish a baseline audiogram shall be preceded by at least 14 hours with no exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise. Flex-Erect will be notified of the need to avoid high levels of non-occupational noise exposure during the 14 hour period immediately preceding the audio metric examination.

Annual Audiogram

At least annually, after obtaining the baseline audiogram, Flex-Erect will obtain a new audiogram for each employee exposed at or above an 8 hour TWA of 85 dB(A).

Evaluation Of Audiogram

Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. The technician may do this comparison. If the annual audiogram shows that an employee has suffered a standard threshold shift. Flex-Erect may obtain a retest within 30 days and consider the results of the retest as the annual audiogram. The physician will review problem audiograms and shall determine

whether there is a need for further evaluation. Flex-Erect will provide the physician performing this evaluation the following information:

1. A copy of the requirements for hearing conservation.
2. The baseline audiogram and most recent audiogram of the employee to be evaluated.
3. Measurements of background sound pressure levels in the audio metric test room.
4. The records of audiometer calibration.

Follow-Up Procedures

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift has occurred, the employee will be informed of this fact in writing within 21 days of the determination. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, Flex-Erect will ensure that the following steps are taken:

1. Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.
2. Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
3. The employee will be referred for a clinical audiological evaluation or an oticological examination, as appropriate, if additional testing is necessary or if the company suspects that a medical pathology of the ear is caused or aggravated by wearing of hearing protectors.
4. The employee is informed of the need for an oticological examination if a medical pathology of the ear is unrelated to the use of hearing protectors. If subsequent audiometric testing of an employee whose noise exposure is less than 8 hour TWA of 90 dB(A) indicates that a standard threshold shift is not persistent. ISK Biosciences will inform the employee of the new audiometric interpretation; and may discontinue the required use of hearing protectors for that employee.

Revised Baseline

An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the physician who is evaluating the audiogram, the standard threshold shift revealed by the audiogram is persistent, or the hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

Standard Threshold Shift

A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging to the change in hearing level by correcting the annual audiogram. When a standard threshold shift occurs, hearing protection shall be re-evaluated and/or refitted and if necessary a medical evaluation shall be conducted.

Audiometric Requirements

Audiometric tests shall be pure tone, air conduction and hearing threshold examination, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency will be taken separately for each ear. Audiometric tests shall be conducted with audiometers that meet the specification of and are maintained and used in accordance with the American National

Standard Specification of Audiometers. Pulse-ton and self-recording audiometers shall meet the same requirements.

Audiometer Calibration

The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 dB or greater require an acoustic calibration. Audiometer calibration will be checked acoustically at least annually. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.

Hearing Protectors

Flex-Erect shall make hearing protectors available to all employees exposed to an 8 hour TWA of 85 dB(A) or greater at no cost. Hearing protectors shall also be replaced as necessary at no cost to our employees. Flex-Erect shall ensure that hearing protectors will be worn by an employee who is exposed to an 8 hour TWA of 85 dB(A) or greater, and who has not yet had a baseline audiogram established. Employees will be given the opportunity to select their hearing protectors provided by Flex-Erect. Flex-Erect will provide training in the used care of all hearing protectors provided to employees. Flex-Erect shall ensure proper initial fitting and supervise the correct uses of all hearing protectors.

Hearing Protector Attenuation

Flex-Erect will evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. Hearing protectors must attenuate employee exposure at least to an 8 hour TWA of 90 dB(A).

For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8 hour TWA of 85 dB(A) or below. The adequacy of hearing protector attenuation shall be reevaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employee shall be provided more effective hearing protection, if necessary.

Record Keeping

Exposure measurements will be maintained for all employees. All employee audiometric test records obtained will also be retained. These will include name and job classification of the employee; date of the audiogram; the examiner's name; date of the last acoustic or exhaustive calibration of the audiometer, and employee's most recent noise exposure assessment. Also, accurate records of the measurements of the background sound pressure levels in audiometric test rooms will be maintained.

Engineering Controls

In areas where noise is found to be above 90 dB(A) engineering will study the problem. If it is possible and feasible to reduce the noise level through engineering controls this will be done. If it is not feasible then this will be documented and shown to OSHA upon request.

Noise Exposure Computation

For an 8 hour workshift with the noise level constant over the entire shift, the TWA is equal to the measured sound level.

PERMISSIBLE NOISE EXPOSURE

Duration per day, hours	Sound level (dBA)
8	90
6	92
4	95
3	97
2	100
11/2	102
1	105
1/2	110
1/4	115

Noise levels are determined using a Type 2 sound level meter measuring on the A-scale at slow response. Maximum level 140 dB import noise.

Following is a Decibel Chart which will give a better description of the source which can cause each decibel level and the damage level.

8. Hearing Protection Devices.

Earplug Protectors- These hearing protection devices are normally referred to as inserts or earplugs. These types of earplugs are made of rubber, plastic, acoustical fibers, foam, and wax impregnated cotton.

- Molded Inserts. They usually have an NRR within the range of 25-26 dB and are made of soft silicone, rubber, and plastic. Advantages: Generally inexpensive, able to wash and reuse, and there is little danger of inserting the plug too far into the ear canal. Disadvantages: Often hard to get a snug fit because of ear canal sizes, eventually the molded insert hardens and shrinks, must maintain a variety of sizes, and possible allergic reaction due to earplug material.
- Form-able Inserts. Due to the design of form-able inserts, they have an NRR that ranges from 27-33 dB. The materials used are often fine glass fiber, expandable plastic, foam, and wax impregnated cotton. Advantages: Can fit all ears, mold to the ear canal, and available with a cord. Disadvantages: Possible to push plug too far into the ear canal, usually good for one time use, becomes dirty easily, and more prone to cause ear infections.

Canal Cap Protectors- This type of protection is made to rest against the outer edge of the ear canal. They are made of a soft rubber and are held in place with a headband. The NRR on this type of protector ranges from 17-25 dB.

- Advantages: Reusable and one size fit all with an adjustable headband.
- Disadvantages: Does not provide a high NRR, and requires regular cleaning.

Earmuff Protectors- Earmuffs are designed to fit over the entire ear and ear lobe and seals against the side of the head with suitable cushion or padding. They generally have an NRR that ranges from 22-29 dB when used properly.

- Advantages: A good alternative to those who are allergic to inserts, easy to replace the protective seal, and many can be adjusted easily to fit an individual's head.

- Disadvantage: Perspiration eventually stiffens the plastic seal, not practical for confined space work, electricians need to wear non-conductive earmuffs, and
- Efficiency of the muff type protector is reduced when worn over the frames of eye protection.

FIT & CARE FOR HEARING PROTECTION

Earplugs

- Proper Fit. Wash your hands. Slowly roll and compress foam plugs into a very thin cylinder. Reach around the head and pull the ear outward and upward during insertion. While compressed - insert plug well into the ear canal, and hold in place for a moment until it begins to expand.
- Proper Care. Keep plugs as clean as possible. Inspect before reinsertion and if damaged or dirty - dispose of immediately and replace. Periodically check to be sure the fit is still snug, and do not share ear plugs with others.

Earmuffs

- Proper Fit. Earmuffs must fully enclose the ears to seal against the head. Adjust the headbands so cushion exerts even pressure, and keep hair from underneath the cushion.
- Proper Care. Clean with warm water and mild soap; do not use alcohols or solvents to clean cushions. Replace the cushion if stiff, worn, cut, or torn, and check the headband for deterioration.

9. Definitions.

Action Level - an eight (8) hour time-weighted average of 85 decibels measured on the A-Scale, slow response.

Audiogram - a chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Audiologist - a professional, specializing in the study and rehabilitation o hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

Baseline - the audiogram against which future audiograms are compared.

Decibel (dB) - unit of measurement of sound level.

Hertz (Hz) - unit of measurement of frequency, numerically equal to cycles per second.

Medical Pathology - a disorder or disease. For purposes of this policy, a condition or disease affecting the ear, which should be treated by a physician specialist.

Noise dose - the ratio, expressed as a percentage, of (1) the time integral, over a stated time or event, of the 0.6 power of the measured slow exponential time-averaged, squared A weighted sound pressure and (2) the product of the criterion duration (8 hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90dB).

Noise dosimeter - an instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

Otolaryngologist - a physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Representative exposure - measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employers deem to be representative of the exposures of other employees in the workplace.

Sound level - ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit decibels (dB).

Sound level meter - an instrument for the measurement of sound level.

FLEX-ERECT

SECTION 8

SUBJECT: Workplace Back Safety Program.

REGULATORY STANDARD: OSHA - 29 CFR 1926.20 - .21

GENERAL: Flex-Erect will ensure that potential back injury risk factors at our jobsites are evaluated and controlled. This program is intended to address the issues of evaluating and identifying back injury hazards, evaluating engineering controls, work practices, administrative controls, and establishing appropriate procedures.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received training before assignment to work.

Section	Contents Workplace Back Safety Program	Page
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2	Training Requirements	2
3	Hazard Prevention and Control	3
4	Administrative Controls	3
5	Safe Lifting Techniques	3

WORKPLACE BACK SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, or when operational changes occur that require a revision of this workplace back safety program.

2. Training Requirements.

2.1 Types of training. Supervisors will determine whether training required for specific jobs will be conducted in a classroom or on-the-job. The degree of training provided will be determined by the complexity of the job and the associated hazards.

2.1.1 Initial Training. All employees will receive awareness training that will describe the basic hazards of lifting and common lifting techniques. Prior to job assignment, Flex-Erect will provide training to ensure that the hazards associated with predetermined job responsibilities are understood by employees and that the knowledge and skills required for the safe application and usage of work place procedures and equipment, are acquired by employees. The training will include the following:

2.1.2 Each affected employee will receive training in the recognition of back injury hazards involved with a particular job, and the methods and means necessary for safe work.

2.1.3 Training course content. All new and current workers, who work in areas where there is reasonable likelihood of back injury, will be kept informed through continuing education programs. Initial and refresher training will, as a minimum, cover the following:

2.1.3.1 Back hazards associated with the job.

2.1.3.2 Lifting techniques.

2.1.3.3 Potential health effects of back injury.

2.1.3.4 Back injury precautions.

2.1.3.5 Proper use of protective clothing and equipment.

2.1.3.6 Use of engineering controls.

2.2 Responsibility. Employees are responsible for following proper work practices and control procedures to help protect their health and provide for the safety of themselves and fellow employees, including instructions to immediately report to the Supervisor any significant back injury.

2.3 Refresher Training. Scheduled refresher training will be conducted periodically.

2.3.1 Retraining will be provided for all affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when their work takes them into other hazard areas.

2.3.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of equipment or procedures.

2.3.3 The retraining will reestablish employee proficiency and introduce new equipment, new lifting procedures or revised control methods and procedures, as necessary.

3. Hazard Prevention and Control.

3.1 Job Hazard Assessment. A job hazard assessment will be performed by Supervisors at the beginning of new jobs. Supervisors will be trained to look for potential back injury risks. This analysis will help to verify risk factors and to determine if risk factors for a work position have been reduced or eliminated to the extent feasible.

3.2 Flex-Erect understands that engineering solutions, where feasible, are the preferred method of control for lifting hazards. The focus of this program is to make the job fit the person, not to make the person fit the job. This is accomplished whenever possible by redesigning the work station, work methods, or tool(s) to reduce the demands of the job, including high force, repetitive motion, and awkward postures. The Safety Manager will, whenever possible, research into currently available controls and technology.

4. Administrative Controls.

Company administrative controls will be used to reduce the duration, frequency, and severity of exposures to lifting hazards, which can cause back injury. Examples of administrative controls include the following:

4.1 Reducing the amount of exposure per employee by such means as decreasing production demand and limiting overtime work.

4.2 Providing rest pauses to relieve fatigued muscles. The length of time needed depends on the task.

4.3 Increasing the number of employees assigned to a task to alleviate severe conditions, especially in lifting heavy objects.

4.4 Using job rotation with caution and as a preventive measure. The principle of job rotation is to alleviate physical fatigue and stress of a particular set of muscles rotating employees among other jobs that use different muscles. Providing sufficient numbers of standby/relief personnel to compensate for foreseeable upset conditions on the line (e.g., loss of workers).

4.5 Job enlargement. Having employees perform broader functions which reduce the stress on specific muscle groups while performing individual tasks.

5. Safe Lifting Techniques.

First, use a pushcart or other material-handling device if available. Ask a co-worker for help if no device is available. If you must lift alone here are some tips. Before starting to lift or carry anything, check your entire walkway to make sure your footing will be solid. Your shoes should give you good balance, support and traction. Keep loads as close to your body as possible. The following situations show basic lifting techniques to avoid injury:

5.1 Lifting or lowering from a high place

5.1.1 Stand on a platform instead of a ladder

- 5.1.2 Lift the load in smaller pieces, if possible
- 5.1.3 Slide the load as close to yourself as possible before lifting
- 5.1.4 Grip firmly and slide it down
- 5.1.5 Get help when you need it to avoid injury

5.2 Lifting from hard-to-get-at places

- 5.2.1 Get as close to the load as possible
- 5.2.2 Keep back straight, stomach muscles tight
- 5.2.3 Push buttocks out behind you
- 5.2.4 Bend your knees
- 5.2.5 Use leg, stomach, and buttock muscles to lift -- not your back

5.3 Lifting drums, barrels, and cylinders

- 5.3.1 Use mechanical equipment
- 5.3.2 Be aware that loads can shift
- 5.3.3 Get help if load is too heavy

5.4 Awkward objects

- 5.4.1 Bend your knees with feet spread
- 5.4.2 Grip the top outside and bottom inside corners
- 5.4.3 Use your legs to lift, keeping back straight

5.5 Shoveling

- 5.5.1 Make sure your grip and balance are solid
- 5.5.2 Tighten your abdomen as you lift
- 5.5.3 Keep the shovel close to your body
- 5.5.4 Use the strength of your thigh muscles to bring you to an upright position
- 5.5.5 Increase your leverage by keeping your bottom hand low and toward the blade

5.6 General safety tips

- 5.6.1 Don’t lift objects over your head
- 5.6.2 Don’t twist your body when lifting or setting an object down
- 5.6.3 Don’t reach over an obstacle to lift a load
- 5.6.4 Pace yourself to avoid fatigue

FLEX-ERECT

SECTION 9

SUBJECT: Personal Protective Equipment Safety Program

REGULATORY STANDARD: 29 CFR 1910 Subpart I and 1926 Subpart E

GENERAL: Flex-Erect attempts to ensure that jobs having a potential for employee injury within our facility(s) are evaluated and controlled. This Program is intended to address the issues of evaluating and identifying potential job hazards and identifying the personal protective equipment (PPE) necessary to eliminate or minimize the risk to the employee.

RESPONSIBILITY: Effective implementation of this program requires support from all levels of management within this company. The Safety Manager is the program coordinator, acting as the representative of the company owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of the company where there is danger of serious personal injury. Supervisors are responsible to ensure that all employees are issued the necessary PPE to perform daily tasks and that PPE is worn properly.

Section	Contents of the PPE Safety Program	Page
1	Written Program	2
2	Specific Responsibilities	2
3	Training and Education	2
4	Jobsite/Work Area Evaluation	3
5	Hazard Prevention and Control	3
6	Protective Clothing and Personal Protective Equipment (PPE)	3
7	Employee Owned PPE	4
8	Inspection, Maintenance and Storage	4
9	Forms	5

PPE PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this Program periodically or when prompted by changes to the applicable regulations. This written program will be communicated to all personnel.

2. Specific Responsibilities.

Supervisors are responsible for identifying the type of PPE required for their subordinates and that their employees are properly trained in its use, care, and maintenance. In addition, Supervisors will ensure that respirators are only used when approved by the Safety Manager and in accordance with the Flex-Erect Respiratory Protection Program.

3. Training and Education.

Supervisors will conduct training for each employee based on the results of a task specific hazard analysis that requires the use of PPE. The purpose of training and education is to ensure that the employees are sufficiently informed about the job hazards to which they may be exposed and thus are able to participate actively in their own protection.

3.1 General Training. Employees will be adequately trained about the Company's personal protective equipment program. Proper training will allow managers, supervisors, and workers to better understand the hazards associated with a job, task, or process. The training shall be documented and maintained within the employees personnel training files.

3.2 Training Content. New employees and reassigned workers will receive an initial orientation and hands-on training prior to being placed in a job. The initial training program will include the following:

3.2.1 Company specific PPE requirements.

3.2.2 A description and identification of the hazards associated with particular jobs/tasks/machines/workstations.

3.2.3 Specific safeguards, how they provide protection, and the hazards for which they are intended.

3.2.4 Proper use, care, and maintenance of the necessary PPE. How to use the equipment; how to properly don and doff, wear and make adjustments including the proper fitting of each affected employee.

3.2.5 Length of useful life/ limitations of the equipment and the correct way to dispose of broken or damaged PPE.

3.3 Certification. Supervisors will certify that employee training has been accomplished. The Safety Manager will ensure that the training is being kept up to date. The certification shall contain each employee's name, supervisor or instructor's name, and dates of training.

3.4 Training for Supervisors. Supervisors will receive training in the necessary PPE required.

3.5 Refresher training. Refresher training will be conducted periodically.

3.6 Retraining shall be provided for all employees whenever there is a process that present a new hazard or the workplace has changed.

3.7 Additional retraining shall be conducted whenever a periodic inspection reveals, or whenever Flex-Erect. has reason to believe, that there are deviations from or inadequacies in the employees' knowledge or use of PPE.

3.8 Certification. Flex-Erect shall certify that employee re-training has been accomplished and is being kept up to date. The certification shall contain each employee's name, supervisor or instructors name and dates of training.

4. Jobsite/Work Area Evaluation.

All jobsites or work areas will be assessed by the Supervisor prior to starting each assigned job for potential hazards that may require PPE. PPE will be used for jobs when elimination of the hazard(s) is not possible. A certified written hazard assessment will be completed reviewed and signed by the supervisor.

4.1 When evaluating the hazards of jobsites or work areas Supervisors must consider the following:

4.1.1 Can the hazard be removed or eliminated?

4.1.2 Can an engineer/administrative control be implemented to eliminate the hazard?

4.1.3 Can a work procedure be implemented to remove or eliminated the hazard?

5. Hazard Prevention and Control.

Flex-Erect understands that engineering solutions, where feasible, are the preferred method of control for workplace hazards. The focus of the Company's PPE Program is to eliminate hazards from the workplace. This is accomplished whenever possible by redesigning the workstation, work methods, or tool(s) to reduce the hazards associated with the demands of the job. This program will, whenever possible, research into currently available controls and technology. PPE will be a last choice.

6. Protective Clothing and Personal Protective Equipment (PPE).

Where engineering controls and job safety analyses do not eliminate all job hazards, employees will (where appropriate) wear personal protective equipment (PPE). At a minimum, the following guidelines will be followed:

6.1 General.

6.2 Loose clothing must not be worn near moving machinery.

6.3 Neckties must be securely clipped to the shirt.

6.4 Employees working in areas where chemicals, solvents, or other irritants, or caustic acids are used will be supplied with face shields, chemical resistant boots, aprons, chemically protective gloves, etc.

6.5 Rings and jewelry must not be worn when working on machinery.

6.6 Safety Glasses. Flex-Erect will make available safety glasses that meet American National Standards Institute requirements for Occupational and Educational Eye and Face Protection, Z87.1-1989, to all employees whose duties have the potential for exposing their eyes to injury from flying objects or electrical flash.

An employee who performs a significant number of duties outdoors that require safety glasses may request one pair of clear glasses and one pair of tinted glasses.

6.7 Where employees use respirators special glasses designed to be worn in conjunction with the respirator will be provided. Photo gray lenses are not approved for wear during operations requiring safety glasses because they do not provide adequate protection in accordance with Company standards.

6.8 Prescription Safety Glasses. Employees that require the use of prescription glasses must wear

OSHA standard Z87.1 glass and side-shields. If the employee's prescription glasses do not meet OSHA standards, the employee must wear safety glasses or goggles over their prescription glasses. Employees are responsible for maintaining a reserve pair of prescription glasses for use when prescription safety glasses are damaged or lost. Safety glasses are mandatory 100% of the time when on company time.

6.9 Ear Protection. Employees working in areas where the noise level is 80 decibels or higher may obtain ear protection through their supervisor or from the Safety Director. Flex-Erect provides a variety of types of hearing protection from which the employee may choose the most effective and best fitting. Further information can be found in the Flex-Erect. Hearing Conservation Program.

6.10 Foot Protection. All employees will wear substantial work boots with fully enclosed coverings to protect their feet and toes. For those employees who work in areas where safety shoes are recommended, the employee will be responsible for purchasing the work boots at his/her own cost. The safety shoes must meet federal standards and can be purchased through several local suppliers.

6.11 Hair/Head Protection. Employees must wear must wear OSHA standard Z89.1 protective helmets at all time. The hardhats will be supplied by the company.

6.12 Operators of forklifts will wear a hard hat when operating the vehicle.

6.13 Employees with long hair (down to the shoulders) should tie their hair back or wear hair nets or caps when working on drill presses, vertical milling machines, or equipment with rotating spindles or other moving machinery.

6.14 Hand Protection. The supervisor must ensure that the hazards to employees hands are evaluated and, if risks exist, provide appropriate hand protection suitable for the needs of the job. Hazards may include those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical or thermal burns, and harmful temperature extremes. Performance characteristics of the hand protection should be evaluated relative to the tasks to be performed, the conditions present, duration of the use, and the hazards or potential hazards identified.

6.15 Supervisors are responsible to assure that employees wear the designated hand protection (gloves) on the job.

6.16 Work gloves (leather-palmed) must be worn by anyone handling raw materials other than chemicals.

6.17 Respiratory Protection. Supervisors are responsible to ensure that Respirators, to include a dust mask (filtering face-piece) are only used when approved by the Safety Manager and in accordance with the Flex-Erect Respiratory Protection Program.

7. Employee Owned Equipment

Employee owned PPE is not permitted. All PPE shall be provided by the company.

8. Inspection, Maintenance and Storage

8.1 Employees are required to inspect all PPE prior to use. Equipment, which is defective or damaged, shall not be used, and immediately replaced.

8.2 Personal Protective Equipment shall be stored in a manner that will not adversely affect its integrity. PPE must be stored in a location that is free of harmful agents, such as chemicals, particulate, sunlight, temperature extremes, excessive moisture or physical agents, such as

sharp objects. All PPE provided shall be used and maintained in a sanitary and reliable condition.

9. Forms

#	Form Name	Page #
1	**Acceptance of Personal Protective Equipment Form**	6

Acceptance of Personal Protective Equipment Form

This form indicates the acceptance of the Personal Protective Equipment (P.P.E.) issued to me by Flex-Erect. This form also verifies that I understand Flex-Erect's minimum PPE requirements which include a Hardhat, Safety Glasses, Sleeved Shirt, Long Pants, and hard soled construction work boots. I will wear the minimum PPE at all time when on a company project or performing company related work.

I also understand it is my responsibility to

- Wear the P.P.E. in the proper manner as it is meant to by the Manufacture's recommendation and by company policy.
- That I am responsible for maintaining it in a proper manner as not to damage, or jeopardize the integrity of the equipment.
- I understand that the basic P.P.E. (hardhat, safety glasses, gloves, etc.) are provided to me free of charge. As such it is my responsibility to ensure the equipment is worn properly and never altered or improvised in any manner.
- That if the equipment becomes damaged in the line of my job or through normal use I will provide the damaged P.P.E. to my supervisor immediate.
- That if I lose any item, forget to bring any item to work or damage it through misuse I will be financial responsible for any replacements as needed.
- Replacements will be payroll deducted from my paycheck accordingly.

I also understand that any Personal Protective Equipment issued to me is owned by Flex-Erect and that it is my responsibility to return all personal protective equipment if I am terminated or quit. I am to return the company's personal protective equipment before I can receive my last paycheck.

By application of my signature below I acknowledge my understanding of the requirements for Personal Protective Equipment and the expectation of my responsibility for its care, use and maintenance. I also understand and agree to my financial obligation as stated above and authorize Flex-Erect to make the appropriate deductions for replacement of any of the items listed above as needed.

_____	_____	_____
Employee Print	Signature	Date

_____	_____
Supervisors Signature	Date

FLEX-ERECT

SECTION 10

SUBJECT: Housekeeping Safety Program

REGULATORY STANDARD: OSHA 29 CFR 1926.25
OSHA 29 CFR 1926.151

GENERAL: This plan is intended to address the issue of providing for maintaining an orderly, clean, and safe work environment at all times in all areas. Good housekeeping is a necessary requirement for maintaining safety at job sites. It is proven that clean and tidy work sites hold fewer hazards for all employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect's where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and maintain their work areas in an orderly fashion throughout the day.

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1	Written Program	2
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3	Housekeeping	2
4	Hazard Assessment.	2
5	Housekeeping Procedures	2

HOUSEKEEPING PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, when operational changes occur that require a revision of this document, or when there is an accident or near miss that relates to this area of safety. This document serves as the written procedures for general housekeeping at Flex-Erect. These guidelines provide housekeeping standards in this facility to help ensure a safe work environment at all times in all areas.

2. Training Requirements.

2.1 All of our employees, including contractor employees, need to understand the safety and health hazards of poor housekeeping and improper chemical storage to protect themselves, their fellow employees, and the citizens of nearby communities. While training in Hazard Communication will help employees to be more knowledgeable about the chemicals they work with as well as familiarize them with reading and understanding SDSs, we will also train them in our our Housekeeping Program, covering housekeeping procedures, safe work practices, hazard reporting, and other areas pertinent to housekeeping.

3. Housekeeping.

Good housekeeping is a necessary requirement for maintaining safety at construction sites, clean and tidy work sites hold fewer hazards for all employees, Accidents and injuries are avoided and productivity improved where good housekeeping is a daily occurrence,

3.1 Good housekeeping is possibly the most visible evidence of management and employee concern for safety and health that a company displays on a day-to-day basis, Orderliness in our workplace contributes to a safe working environment by minimizing obstacles and potential safety and health threats such as spills, trip hazards, etc. In fact, we have nine good reasons for housekeeping:

- 3.1.1 Prevents accidents
- 3.1.2 Prevents fire
- 3.1.3 Saves time
- 3.1.4 Gives control to our workers and the freedom to move
- 3.1.5 Gives our workers pride
- 3.1.6 Protects our products and equipment
- 3.1.7 Reduces our waste

4. Hazard Assessment.

Supervisors are responsible for identifying main housekeeping issues. Supervisors will look for a lack of order, unremoved spills or obstructions, or other hazards due to poor organization or poor housekeeping.

5. Housekeeping Procedures

It is the intent of this company to standardize housekeeping measures, meet OSHA requirements, and encourage safety. The procedures listed below cover many of the common jobsites we will have.

5.1 All tools and equipment must be kept in good working condition. Hand tools, portable electric tools, extention cords and similar equipment should be kept in tool boxes or other designated locations when not in use.

5.2 Aisles, Walkways, and Floors must be kept clear to allow for easy access to fire extinguishers, electrical disconnects, safety showers, and other emergency aids.

5.3 Electrical panels must be kept clear for an area of 36 inches in front.

5.4 Walkways not for pedestrian traffic must be clearly marked.

5.5 Keep aisles and walkways free of physical obstructions that would prevent access, including path-blocking objects, liquid or solid spills, and other obstructions.

5.6 Keep stairs clean, dry, and free of waste, well-lit, and provided with adequate hand rails and treads that are in good condition.

5.7 Keep floors clean; dry (dry as possible); slip-resistant; and free of waste, unnecessary material, oil and grease, protruding nails, splinters, holes, or loose boards.

5.8 An adequate number of waste receptacles at accessible locations throughout all work areas must be provided.

5.9 All areas must be cleaned of scrap and tools before leaving for breaks, lunches, or to go home at the end of the day.

5.10 Office Areas, reception areas, meeting rooms, and/or personal office spaces as part of our office space must be clean throughout the workday

5.11 Keep doors and windows properly maintained in good working order. Repair any damage to doors and windows at regular intervals.

FLEX-ERECT

SECTION 11

SUBJECT: Fire Protection Safety Program

REGULATORY STANDARDS: OSHA 29 CFR 1910.155
OSHA 29 CFR 1926 Subpart F

GENERAL: Flex-Erect will apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. This section provides guidelines for the protection of personnel from fires and the prevention of fires. This procedure applies to all company divisions, on-site construction and maintenance projects.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of a potential fire. Supervisors are required to ensure their employees are aware of the contents of this program and have received fire prevention & protection safety training. Subcontractors are required to follow the fire prevention & protection guidelines.

Section	Contents of the Fire Protection Safety Program	Page
1	Written Program	2
2	Training Requirements	2
3	General Guidelines	2
4	Storage of Flammable & Combustible Liquids	3
5	Storage of Compressed Gas Cylinders	4
6	Maintenance & Inspection	5
7	Recharging	5
8	Substitution	5
9	Signs and Labels	6
10	Definitions	6

Fire Protection Safety Program

1. Written Program.

The Fire Protection Procedures will apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. The Fire Protection Procedures establish guidelines to follow when employees of Flex-Erect perform any hot work. Flex-Erect will review and evaluate this program periodically, when changes occur to the regulations, when operational changes occur that require a revision of this document, when there is an accident or near miss that relates to this area of safety, or any time these procedures fail.

2. Training.

It is the policy of Flex-Erect to train personnel in the fire protection procedures, general principles of fire extinguisher use and the hazards involved in incipient stage firefighting. Subcontractors will be responsible for training their employees.

2.1 Initial Training. Fire protection training will be included as a component of employee safety training. This training may include fire behavior, the classes and types of fire, and the safe use of fire extinguishers. The training content will be identical to initial training. Refresher training will be conducted on an annual basis. Retraining will occur when the following conditions are met, whichever event occurs sooner.

2.1.1 Retraining will be provided for all employees whenever a known hazard is added to the work environment which affects the fire protection program.

2.1.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of the fire prevention & protection procedures.

3. General Guidelines.

- Good housekeeping and fire prevention go hand-in-hand for obvious reasons, not only on your job site but in the office, as well. Fires can start anywhere at any time and this is why it is important to know how to use a fire extinguisher and which fire extinguisher to use on different types of fire.

- The fact that fire extinguishers are our first line of defense in the event of a fire should warrant a periodic and complete inspection. Fire extinguishers must be kept clean to attract attention, they must be conspicuously located and kept accessible to eliminate lost time when needed, and the rubber hose, horn or other dispensing component must be checked to assure against blockage. Also know where and how to activate the fire alarm and sprinkling systems.

- An alarm system will be established for notification of all employees at the site of an emergency. The alarm system should include lights, horns, sirens, or other appropriate devices to ensure that every employee is aware of shop/project emergencies.

- To prevent ignition hazards, electrical wiring and equipment will be installed in accordance with the National Electrical Code and National Fire Protection Association (NFPA) Code 70. Smoking will be prohibited in areas where fire hazards may exist.

- **General Industry**- A portable fire extinguisher shall be provided for a **Class A** hazard so that the travel distance for employees to any extinguisher is 75 ft. or less. A portable fire extinguisher shall be provided for a **Class B** hazard so that the travel distance for employees to any extinguisher is 50 ft. or less. A portable fire extinguisher shall be provided for a **Class C** hazard on the basis of the appropriate pattern for the existing **Class A** or **Class B** hazards. A portable fire extinguisher shall be provided for a **Class D** hazard so that the travel distance from the combustible metal working area to any fire extinguishing agent for employees to any extinguisher is 75 ft. or less.

- **Construction**- A portable fire extinguisher rated not less than 2A will be provided for each 3,000 square feet of building area and in each yard storage area. Travel distance to any fire extinguisher will not exceed 100 feet from any protected area.

- One or more extinguishers rated not less than 2A will be located on each Flex-Erect occupied floor of a multi-storied building. At least one 2A-rated extinguisher will be located adjacent to a stairway in a multi-storied building. Extinguishers rated not less than 10B will be provided between 25 feet and 75 feet of any area in which more than 5 gallons of flammable liquids or 5 pounds of flammable gas are being used or stored. Note: This does not apply to fuel tanks of motor vehicles.

- Extinguishers will be conspicuously located where they will be readily accessible and immediately available in case of a fire, and their locations will be conspicuously marked. Extinguishers will be installed on hangers or in the brackets provided. Those extinguishers are not more then 5 feet from the floor. Those extinguishers weighing more than 40 pounds will be installed so the top is not more than 3 feet from the floor.

- In the case of an emergency follow the emergency action plan and evacuate the building if necessary.

4. Storage of Flammable Liquids

- Above ground storage tanks shall have spill containment capable of controlling 110% of capacity of tanks.

- All liquids should be considered as flammable unless the label clearly indicates that no such exposure exists.

- Conditions on construction sites change so rapidly that extreme care is necessary whenever flammable liquids are being used. Flammable liquids can be ignited by open flames, sparks, or excessive heat, so it is necessary that each of these factors be considered when setting up safe storage facilities for these items.

- No other equipment or materials should be contained in the area where flammable liquids are stored.

- All areas that are to be used for the storage of flammable liquids should be conspicuously designated as such, and No Smoking signs posted.

- The “No Smoking” must be vigorously enforced. These areas shall always be located so that local fire protection will always have access to the material.

- Only approved containers can be used for the storage of flammable liquids, and each container must have an emergency-venting device.

- All containers, from which flammable liquids are to be dispensed, shall be grounded, and when transferring flammable liquids, the dispensing container shall be bonded to the receiving container.

- Fire protection should be available no closer than 25 feet but no further than 75 feet of the flammable liquid storage area.

5. Storage of Compressed Gas Cylinders

- Cylinders shall be kept away from radiators and other forms of heat (protected from solar).

- Inside buildings, cylinders shall be stored in a dry, well-ventilated and protected area. Cylinders shall not be stored in unventilated enclosures such as lockers and cupboards.

- Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or be subject to tampering by unauthorized persons.

- Empty cylinders shall have the valves closed. Storage of cylinders shall be separated and identified with content and condition (full or empty).

- When cylinders are not in use the caps shall be in place and the cylinders shall be secured (chained) in an upright position at all times, including when being hoisted or transported.

- Small, hand held compressed gas cylinders used for propane torches, gas detector test cylinders, etc. should be stored in the upright position.

- A 20-pound ABC rated fire extinguisher (minimum) shall be placed no closer than 25 feet, but not further than 75 to a compressed gas storage areas.

- Warning signs shall be conspicuously placed and shall read “Danger-No Smoking" or other equivalent wording in a compressed gas storage area.

- Inside buildings, cylinders (except those in actual use or attached for use) shall be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of liquefied petroleum gas.

- Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum of 20 feet, or by a noncombustible barrier at least five feet high having a fire-resistant rating of at least one-half (1/2) hour.

- LPG gas cannot be stored inside buildings. LPG gas must be stored in a tamper resistant structure with ventilation and have no open flame or smoking signs posted.

- Storage area shall be at least 25 feet from buildings.

6. Maintenance & Inspections

- The Safety Manager, Supervisor, or designated employee will develop a maintenance program which will include periodic inspections of the fire protection equipment.

- Extinguishers will be inspected monthly or more often when circumstances warrant, to ensure that they have not been actuated or tampered with, and to detect any damage. Inspection tags will be placed, and the date of inspection will be indicated after each inspection. Hydro-testing or weighing in accordance with NFPA requirements should be completed.

- Each portable fire extinguisher will be inspected annually by a qualified person that is licensed through the state and will be equipped with a current annual inspection tag. Portable fire extinguishers that are not equipped with a current annual inspection tag shall be removed from service and re-inspected.

7. Recharging

A plan will be established for the prompt recharging and testing of fire extinguishers in accordance with NFPA standards.

8. Substitutions

In areas where 2A extinguishers are required, the following may be substituted for each extinguisher:

- One 55-gallon barrel of water with three pails.

- A water hose of not less than ½ inch diameter, of not more than 100 feet in length, and with a discharge capacity of 5 gallons per minute; or

- One fire hose of not less than 1 ½ inch diameter, of not more than 100 feet in length, and with a discharge capacity of 25 gallons per minute.

Note: The hose referred to above must be of sufficient length and have a stream range so as to reach all points in the protected area. These substitutions will not apply in circumstances where the possibility of freezing exists.

9. Signs and Labels.

Fire extinguisher stations shall be conspicuously marked with approved signs and labels. The sign and labels must be posted in plain view at the fire extinguisher station.

10. Definitions.

"Approved", for the purpose of this subpart, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc., or Federal agencies such as Bureau of Mines, or U.S. Coast Guard, which issue approvals for such equipment.

"Closed container" means a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

"Combustion" means any chemical process that involves oxidation sufficient to produce light or heat.

"Flammable" means capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

Flammable liquid means any liquid having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100 ºF (37.8 ºC) and having a flashpoint at or below 199.4 ºF (93 ºC). Flammable liquids are divided into four categories as follows:

- Category 1 shall include liquids having flashpoints below 73.4 ºF (23 ºC) and having a boiling point at or below 95 ºF (35 ºC).
- Category 2 shall include liquids having flashpoints below 73.4 ºF (23 ºC) and having a boiling point above 95 ºF (35 ºC).
- Category 3 shall include liquids having flashpoints at or above 73.4 ºF (23 ºC) and at or below 140 ºF (60 ºC).
- Category 4 shall include liquids having flashpoints above 140 ºF (60 ºC) and at or below 199.4 ºF (93 ºC).

Flash point of the liquid means the temperature at which it gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used as determined by appropriate test procedure and apparatus as specified below.

The flashpoint of liquids having a viscosity less than 45 Saybolt Universal Second(s) at 100 ºF (37.8 ºC) and a flashpoint below 175 ºF (79.4 ºC) shall be determined in accordance with the Standard

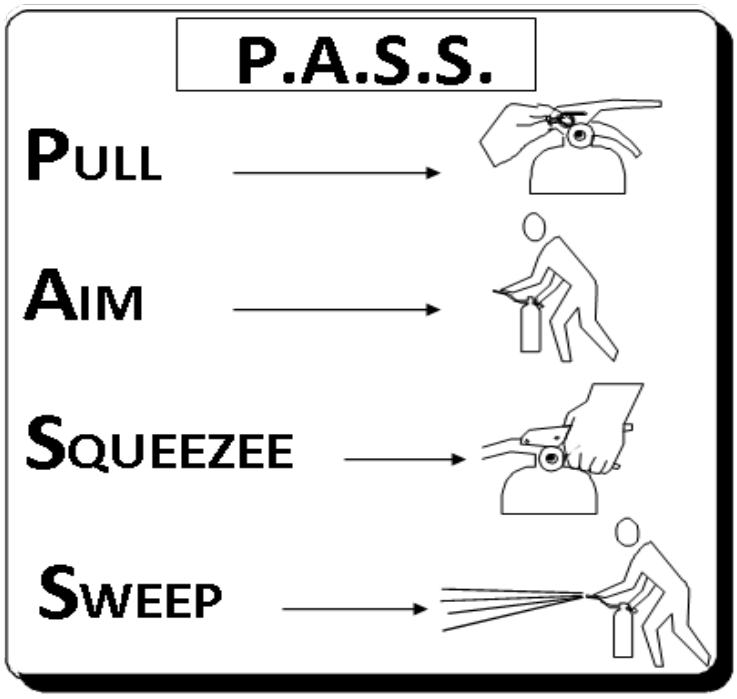
Method of Test for Flash Point by the Tag Closed Tester, ASTM D-56-69 (incorporated by reference; See § 1926.6), or an equivalent method as defined by § 1910.1200 appendix B.

The flashpoints of liquids having a viscosity of 45 Saybolt Universal Second(s) or more at 175 ºF (79.4 ºC) or higher shall be determined in accordance with the Standard Method of Test for Flash Point by the Pensky Martens Closed Tester, ASTM D-93-69 (incorporated by reference; See § 1926.6), or an equivalent method as defined by § 1910.1200 appendix B.

Liquefied petroleum gases, LPG and LP Gas mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them, such as propane, propylene, butane (normal butane or iso-butane), and butylenes.

Portable tank means a closed container having a liquid capacity more than 60 U.S. gallons, and not intended for fixed installation. "Vapor pressure" means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)." (ASTM D-323-58).

Remember the PASS word:



COMMON FIRE CLASSIFICATIONS



"Ordinary" combustibles
Paper, wood, rubber, plastics and textiles.



"Flammable liquids"
Oil, gasoline, solvents



"Energized circuits"
Electrical equipment and computers

FLEX-ERECT

SECTION 12

SUBJECT: Equipment, Tools, and Ground Fault Safety Program

REGULATORY STANDARD: OSHA 29 CFR 1926 Subpart I, 1926.404 and
OSHA 29 CFR 1910 Subparts O and P

GENERAL: Flex-Erect attempts to ensure that hazards associated with tools and other cord and plug operated electrical equipment are evaluated. This program is intended to address the issues of evaluating and identifying tool selection and use deficiencies, evaluating the associated potential hazards, communicating information concerning these hazards, minimizing the possibility of injury or harm, and establishing appropriate procedures and protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of the company owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of the company where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the proper training for the specific equipment and tools necessary for each job assignment.

Section	Contents of the Assured Equipment Grounding Program	Page
1	Written Program	2
2	Training Requirements	2
3	General Requirements	3
4	Ground Fault Protection	3
5	Equipment/Tool Selection	4
6	Equipment/Tool Precautions	4
7	Inspections and Recordkeeping	5
8	Forms	5

EQUIPMENT, TOOLS, AND GROUND FAULT SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations or when operational changes occur that require a revision of this document.

2. Training Requirements.

Training will be conducted prior to job assignment. Flex-Erect will provide training to ensure that the grounding requirements, purpose, function, and proper use of equipment and tools to be used in the normal function of their jobs is understood by employees. This program will be provided to, and read by all employees receiving training.

2.1 General. Under no circumstances will an employee operate a piece of machinery or equipment until they have successfully completed training. This includes all new operators or users of machinery and equipment, regardless of claimed previous experience.

2.2 Training Content.

- 2.2.1 Grounding requirements for tools and associated site electrical equipment.
- 2.2.2 Types of equipment and tools appropriate for use.
- 2.2.3 Recognition of applicable electrical hazards associated with work to be completed.
- 2.2.4 Procedures for removal of equipment and/or tools from service.
- 2.2.5 Basic maintenance for equipment and tools.

2.3 Supervisors. Supervisors will identify all new employees in the employee orientation program and make arrangements with department management to schedule the classroom instruction for those employees identified as needing training. Supervisors will be trained by the Safety Manager to ensure they are capable of communicating the necessary safety information to employees.

2.4 Certification. Flex-Erect will verify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training.

2.5 Refresher Training. Refresher training will be conducted on as required basis or when the following conditions are met.

- 2.5.1 Retraining will be provided for all authorized and affected employees whenever a known hazard is added to the work environment.

- 2.5.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of tools.

- 2.5.3 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

3. General Requirements.

Flex-Erect is responsible for the safe condition of tools and equipment used by its employees. Tools and equipment that may be furnished by employees must be approved for use by Supervisors and will be included under this program. Supervisors will ensure that equipment utilized at each job site is maintained in a safe condition.

3.1 Employees will not remove guards, ground pins, or other safety devices from equipment, tools or machinery.

3.2 Defective tools or equipment must be reported and/or turned into the Supervisor.

3.3 All tools and equipment will be operated in accordance with the specific safety rules and manufacturer's specifications.

3.4 Compliance with the guidelines of this program is mandatory and failure to comply with them will result in disciplinary action, up to and including discharge.

4. Ground Fault Protection.

The following precautions will be taken by employees of this company to prevent injuries resulting from electrical equipment or tools.

4.1 Each supervisor will use **ground fault circuit interrupters (GFCI)** as the primary means of protection for employees from electrical (ground fault) hazards.

4.1.1 GFCI's. GFCI's will be used on all extension cords and portable tools. GFCI's will be installed at the outlet before inserting the tool or extension cord. All employees using GFCI's must test them prior to use.

4.1.2 Faulty GFCI's must be turned into the Supervisor or Safety Manager for replacement.

4.2 The Safety Manger will be responsible to ensure that supervisors are informed if the use of assured *equipment grounding conductor program* in addition to GFCI's will be required on any project. In the event that an assured equipment grounding program is necessary the following guidelines will be followed:

4.2.1 Tests to perform.

4.2.1.1 Tested for continuity and shall be electrically continuous.

4.2.1.2 Each receptacle and attachment cap or plug tested for correct attachment of the grounding conductor.

4.2.1.3 Intervals. All required tests should be performed at a minimum of every 3 months.

4.2.1.4 Color Coding. A system of color-coding will be used on all equipment tested to ensure tests have been performed. The color coding will be as follows:

Month Tested	Tape Color
January	White
April	Green
July	Red
October	Orange
Repairs	Brown

5. Equipment/Tool Selection.

Supervisors will consider the following when selecting tools for use by employees:

5.1 Is the tool correct for the type work to be performed?

5.2 Is the grounding terminal present on the plug or is the tool double insulated?

5.3 Are grounding terminals or grounding-type devices plugs defeated in any way?

5.4 Are conductors used as a grounded conductor identifiable and distinguishable from all other conductors?

5.5 Is each extension cord set and equipment connected by cord and plug visually inspected daily before use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage?

5.6 Is equipment found damaged or defective removed from service until repaired or replaced?

5.7 Are guards installed properly and in good condition?

6. Equipment/Tool Precautions.

The following precautions will be taken by employees of this company to prevent injury:

6.1 Power tools will always be operated within their design limitations.

6.2 Proper PPE must be worn (safety glasses, gloves, etc.) when in operation.

6.3 Tools will be stored in an appropriate dry location when not in use.

6.4 Tool work will only be conducted in well-illuminated locations.

6.5 Tools will not be carried by the cord or hose.

6.6 Cords or hoses will not be yanked to disconnect it from the receptacle.

6.7 Cords and hoses will be kept away from heat, oils, and sharp edges or any other source that could result in damage.

6.8 Tools will be disconnected when not in use, before servicing, and when changing accessories such as blades, bits and cutters.

6.9 Observers will be kept at a safe distance at all times from the work area.

6.10 Work will be secured with clamps or a vice where possible to free both hands to operate tools.

6.11 To prevent accidental starting, employees should be continually aware not to hold the start button while carrying a plugged-in tool.

6.12 Tools will be maintained in a clean manner, and properly maintained in accordance with the manufacturer guidelines.

6.13 Ensure that proper shoes are worn and that the work area is kept clean to maintain proper footing and good balance.

6.14 Ensure that proper apparel is worn. Loose clothing, ties, or jewelry can become caught in moving parts.

6.15 Tools that are damaged will be removed from service immediately and tagged "Do Not Use". They will be reported and turned over to the Supervisor or Safety Manager for repair or replacement.

6.16 All cracked saws will be removed from service.

7. Inspections and Recordkeeping.

7.1 Machinery, tools, and equipment will be inspected regularly to insure safety and serviceability. Supervisors inspect all machinery, equipment, cords, and accessories before every use.

7.2 Supervisors will also maintain records of inspections of machinery, tools, and equipment. Records will be kept in the management office. The Safety Manager will maintain records in employee safety files of individuals trained and certified for equipment and tools.

8. Forms

#	Form Name	Page #
1	**Power Tool & Extension Cord Inspection Form**	**6**

ELECTRICAL- Power Tool & Extension Cord Inspection
MONTH _____ COLOR _____

ID#	Type	Size	Is cord free of damages?	Is ground prong intact?	Are all prongs intact?	Is body of tool damaged?	Are all guards in place?	Does tool appear safe?	Was a continuity test conducted?	Comments
Remarks:										
Signature of Inspector:										

FLEX-ERECT

SECTION 13

SUBJECT: Hand & Power Tool Safety Program

REGULATORY STANDARDS: 29 CFR, 1926.301 - Hand Tools & 29 CFR, 1926.302 - Power Operated Hand Tools

GENERAL: The hazards associated with the use of hand tools often requires special safety considerations, hand tools can cause serious accidents when defective, used incorrectly or used for a different job than designed. It is not possible to detail all the risks; however, it is possible to foresee many hazards by carefully planning each job to promote the safe use of hand & power tools, and other devices.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who has the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the required safety training before working in any areas where hazards exist.

Section	Contents of the Hand & Power Tool Safety Program	Page
1	Written Program	2
2	General Safety Rules	2
3	Guards	3
4	Powered Abrasive Wheel Tools	3
5	Grinding Wheels	4
6	Pneumatic Tools	4
7	Hand & Power Tools	5
8	Compressed Air	5

Hand & Power Tool Safety Program

1. Written Program

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations or when operational changes occur that require a revision of this document.

2. General Safety Rules

- Follow all manufacture instructions regarding the safe storage, operation, and maintenance of hand and power tools.
- Always use appropriate safety equipment and proper personal protective equipment.
- All hand and power tools shall be maintained in a safe condition
- Store tools that are not in use. Proper storage includes toolboxes, tool racks, and cabinets.
- Do not leave tools on overhead work areas where they may fall and strike someone below.
- Do not carry a sharp or pointed tool in pockets or belts unless the point or edge is protected with a cover.
- Do not use a power tool unless you have been trained on how to use it properly and safely.
- All guards must be in place before operating a power tool.
- Appropriate eye protection must be worn.
- Do not wear loose fitting clothing or jewelry when using power tools.
- Disconnect the tool before changing blades, bits, etc. Remove chuck keys, etc. before using a power tool.
- Never carry a power tool by the cord or hose and never yank the cord or hose to disconnect the tool from any power source. This can damage the cord and malfunctions.
- Make sure that tools are either double insulated, or have three prong plugs with grounded extension cords and receptacles.
- Keep your finger off the trigger and make sure the switch is “off” before plugging in a tool.

- Do not use electric tools that have worn or damaged plugs or cords.

- Secure work with clamps or a vise to keep your hands free. If the material being worked on breaks loose, it could cause a serious injury to the operator.

- When using power tools, keep the work area free of any trip hazards, or slippery conditions.

- Never use compressed air to blow off yourself, equipment, or clothing; use a brush.

- Use manufacturer-recommended protective equipment (goggles, safety glasses, or hard hats) when using the tool.

- When a tool is damaged, malfunctioning, or is not in compliance with any applicable requirement of this program, the tool must be remove from service and not returned to service until it has been repaired.

3. Guards

- All moving parts of power tools need to be safeguarded. Moving parts are, but not limited to, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment. These types of parts must be guarded if exposed or contact is a possibility.

- Guards should be provided to protect the operator and others from the point of operation, nip points, rotating parts and flying chips.

- Safety guards must never be removed when a tool is being used. For example, portable circular saws and grinders must be equipped with guards. An upper guard must cover the entire blade. A retractable lower guard must cover the cutting edge, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

- Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground. The third prong should never be removed from the plug.

4. Powered Abrasive Wheel Tools

- Abrasive grinding, cutting, polishing, and wire buffing wheels present special safety problems because they may throw fragments.

- Before an abrasive wheel is mounted it should be inspected and sound or ring tested to be sure that it is free of cracks or defects. Tap the wheel with a non-metallic instrument. If it sounds cracked or dead, it could fly apart. A good wheel will give a clear metallic tone or ring.

- Be sure the wheel fits freely on the spindle. The spindle nut should be tight but, the flanges should not be distorted.

- Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee should never stand directly in front of the wheel as it accelerates to full operating speed.

- Portable grinding tools need to be equipped with safety guards to protect employees not only from the moving wheel surface, but also from flying fragments in case of breakage. In addition, when using a powered grinder always use eye protection, turn off the power when not in use, and never clamp a hand-held grinder in a vise.

5. Grinding Wheels

- Work rests must be no more than 1/8 inch from the wheel to prevent fingers from contacting or being pinched by the wheel.

- Appropriate eye protection must be worn when operating a grinding wheel. A transparent eye shield shall be permanently mounted to the machine.

- The "tongue guard" must be no more than 1/4 inch from the wheel to prevent flying pieces of the wheel from striking the operator if it shatters.

- Bench and pedestal grinders must be securely mounted.

- Side guards must cover the spindle, nut flange and 75% of the wheel diameter.

- A "ring" test shall be conducted on new or reinstalled grinding wheels.

- Wheels with a dull sound shall not be used, and shall be treated like a defective tool.

6. Pneumatic Tools

- Pneumatic tools are powered by compressed air. Examples are, but not limited to, chippers, drills, hammers, and sanders.

- Getting hit by one of the tools attachments or by a fastener is one of the main hazards.

- Eye and face protection is required for employees working with pneumatic tools.

- Proper hearing protection is required when using pneumatic tools.

- Pneumatic power tools must be securely attached to the compressed air hose.

- Do not make adjustments to pneumatic tools until you are sure that no air pressure is being supplied to the hose or tool.

- Do not hoist, lower, or carry a tool by the hose.

- Follow the manufacturer's guidelines for safe operating procedures.

- Locate all air hoses so they do not present a tripping hazard.

7. Hand & Power Tools

- Use hand and power tools only for the purpose for which they were designed.

- Use hand and power tools that are in good condition. Worn or broken tools must be repaired or replaced.

- Hand and power tools shall be used in compliance with manufacturer specifications and guidelines.

- Tools shall be visually inspected daily to ensure they work properly. Damaged or defective tools shall be repaired and/or removed from service and tagged or placed in a controlled area for future service.

- Do not remove or modify tool guards or protective devices.

- Disconnect power tools from the power source by pulling out the plug--do not pull on the power cord.

- Power tools shall not be hoisted or lowered by its power cord.

- Employees using hand and power tools must wear the appropriate personal protective equipment.

- Damaged or defective tools or power cords shall be tagged or isolated so they may not be used inadvertently.

- Powder actuated tools shall be used only by Authorized Personnel.

- Powder actuated tools shall be given the same respect given to firearms; they are extremely dangerous if used improperly.

8. Compressed Air

- Never use compressed air for personal cleaning of any type.

- Never discharge compressed air at another person.

- Only approved safety nozzles shall be used on air hoses, OSHA standards limit air output to 30 psi for cleaning purposes. When cleaning holes, floors, etc., employees are required to wear full eye protection that shall include goggles or face shields.

- Air lines shall be inspected daily for damage or excessive wear.
- Air lines shall not be exposed to excessive pedestrians and protected from vehicular traffic.
- Connection devices shall be pinned to prevent accidental disconnection.

FLEX-ERECT

SECTION 14

SUBJECT: Fall Protection Safety Program

REGULATORY STANDARDS: OSHA - 29 CFR 1910.66
29 CFR 1926.104
29 CFR 1926.500

GENERAL: Flex-Erect attempts to ensure that the hazards of all elevated falls over 6 feet in length in Construction and 4 ft. in length in General Industry, within our work areas are evaluated, and that information concerning their hazards is transmitted to all employees. This Program is intended to address the issues of evaluating potential fall hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees. It must be understood that Flex-Erect has a 100% tie-off at any height above 6'-0".

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the fall protection training before working in any areas where fall hazards exist.

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FALL PROTECTION PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the applicable regulations, when operational changes occur that require a revision of this document, when there is an accident or near miss that relates to this area of safety, or any time fall protection procedures fail.

2. Training Requirements.

Under no circumstances shall employees work in areas where they might be exposed to fall hazards greater than 6 ft. in a construction workplace, fall hazards greater than 4 ft. in a general industry workplace, do work requiring fall protection devices, or install and use fall protection devices until they have completed fall protection training. Flex-Erect will arrange for training to ensure that the purpose, function, and proper use of fall protection are understood by employees and that the knowledge and skills required for the safe application and usage is acquired by employees.

2.1 Training will be arranged by the Safety Manager and be conducted by competent personnel. The training will include but will not be limited to:

- 2.1.1 A description of fall hazards in the work area.
- 2.1.2 Types of fall protection systems appropriate for use such as guardrails, warning lines, and fall arrest systems.
- 2.1.3 Selection and use of personal fall arrest systems, including application limits, proper anchoring and tie-off techniques, estimation of free fall distance, methods of use, and inspection and storage procedures.
- 2.1.4 Recognition of the hazards of falling from elevations and to avoid falls from grade level to lower levels through holes or openings in walking/working surfaces.
- 2.1.5 OSHA Fall Protection Regulations
- 2.1.6 Procedures for removal of protection devices from service for repair or replacement.
- 2.1.7 Procedures for Prompt Rescue.
- 2.1.8 Procedures for Investigating Fall related accidents or near misses.

2.2 Certification. Flex-Erect will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Documentation of training records shall be maintained within the employee training files.

2.3 Retraining. This Program will be provided to, and read by all employees receiving refresher training. Refresher training will be conducted periodically and when the following conditions are met.

- 2.3.1 Retraining will be provided for all authorized and affected employees whenever (and prior to) there is a change in the type of fall protection equipment used, or when a known hazard is added to the work environment which affects the fall protection program.
- 2.3.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of fall protection

equipment or procedures.

2.3.3 Whenever a fall protection procedure fails.

2.3.4 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

2.4 Certification. Flex-Erect will verify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. The training will be documented and maintained in our personnel's safety files.

3. Jobsite/Workarea Evaluation.

All jobsites or work areas will be assessed by the Supervisor and employees before each assigned job for potential fall hazards. A proper fall protection system will be used for jobs requiring fall protection when elimination of the hazard(s) is not possible.

3.1 When evaluating the fall hazards of jobsites or work areas Supervisors must consider the following:

3.1.1 Must the work be performed at an elevation?

3.1.2 Are there any floor holes or openings greater than 2 inches in diameter?

3.1.3 Can a standard guardrail system be installed?

3.1.4 Can a barricade system be implemented?

3.1.5 Will warning line systems be sufficient protection?

3.1.6 Can Aerial Lifts or Platforms be used to increase worker safety?

3.1.7 Will the use of a fall arrest system be required?

3.1.8 Will a detailed, job-specific, fall protection plan be required?

4. Fall Protection Systems.

When fall hazards cannot be eliminated through any other means, fall arrest systems will be used to control falls. The fall arrest systems will meet the requirements of applicable ANSI, ASTM, or OSHA requirements. Proper training on the use of fall arrest equipment is essential and will be provided prior to use. Supervisors will identify what types of fall protection systems can be used when conducting the job safety analysis for the jobsite. Supervisors must consult with the Safety Manager prior to implementation of any fall protection system. The following systems have been identified by Flex-Erect as generally accepted for work conducted at our job sites.

4.1 Floor Holes. Employees must be protected from falling through or into floor holes at or above 2 inches in diameter as follows:

4.1.1 All covers shall be color-coded or marked with the word "HOLE" or "COVER" to provide warning of the hazard.

4.1.2 Covered with material of sufficient strength capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

4.1.3 All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

4.2 Falling Object Protection. Employees must be protected from falling objects when overhead/

elevated work is in progress. All personnel working in these areas shall wear a hard hat at all time. Measures that may be used to protect personnel from falling objects are as follows:

4.2.1 Toe boards when used, shall be erected along the edge of the elevated working floors, platforms, scaffolding and equipment to prevent tools and materials from falling to the lower levels and to protect the employees working below. Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.

4.2.2 Canopies, when used as falling object protection, shall be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

4.2.3 Controlled Access Zones when used shall be used to control access to areas where leading edge, overhead work and other operations are taking place. The controlled access zone shall be defined by a control line or by any other means that restricts access.

4.2.4 Safety Nets when used shall be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.

4.3 Impalement Hazards. Vertical & Horizontal impalement hazards shall be identified and covered/ protected prior to allowing personnel to work in an area. Measures that may be used to protect personnel from impalement hazards are as follows:

4.3.1 Remove the impalement hazard(s) if possible

4.3.2 Cover the impalement hazard(s) with an approved cap or method designed for impalement protection.

4.3.3 Install a barricade to prevent personnel from entering the areas where the impalement hazard(s) exists.

4.4 Guard Rail Systems. Guard rail systems must meet these minimum requirements:

4.4.1 Have a top rail height of 42” (plus or minus 3”) for Construction and 42” for General Industry

4.4.2 Have a proper midrail 21” or at the midpoint of the toprail.

4.4.3 Have a top rail able to withstand 200 lbs downward/outward force

4.4.4 Have a midrail able to withstand 150 lbs downward/outward force

4.4.5 Have a toe board minimum of 3 1/2 inches in vertical height from the top edge to the level of the walking surface for Construction and a toe board minimum of 4 inches in a vertical height from the top edge to the level of the walking surface in General Industry.

4.4.6 Toe boards must not have more than 1/4 inch clearance above the walking surface.

4.4.7 Toe boards must be solid or have openings not over 1 inch in greatest dimension.

4.4.8 If the top rail is made of wire rope it must be flagged every 6 feet

4.4.9 All rails must be a minimum of 1/4” diameter or greater

4.5 Warning Line Systems. Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

4.5.1 Flagged at not more than 6-foot (1.8 meters) intervals with high-visibility material.

4.5.2 Lowest point including sag is no less than 34 inches (0.9 meters) from the surface and highest point is no more than 39 inches (1 meter) from the surface.

4.5.3 Stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches (0.8 meters) above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge.

4.6 Fall Arrest System. A Personal Fall Arrest System [PFAS] consists of a full-body harness, lanyard, energy shock absorber, and self-locking snap hook. Before using a PFAS, the supervisor and/or the user must address such issues as:

4.6.1 Has the user been trained to recognize fall hazards and to use fall arrest systems properly?

4.6.2 Are all components of the system compatible according to the manufacturer's instructions?

4.6.3 Have appropriate anchorage points and attachment techniques been reviewed?

4.6.4 Has free fall distance been considered so that a worker will not strike a lower surface or object before the fall is arrested?

4.6.5 Have swing fall hazards been eliminated?

4.6.6 Have safe methods to retrieve fallen workers been planned?

4.6.7 Has the full-body harness and all of its components been inspected both before each use and on a regular semi-annual basis?

4.6.8 Is any of the equipment, including lanyards, connectors, and lifelines, subject to such problems as welding damage, chemical corrosion, or sandblasting operations?

4.6.9 Will it meet these minimum requirements:

4.6.9.1 Limit maximum arresting force on an employee to 1,800 pounds

4.6.9.2 Be rigged so that an employee can neither free fall more than 6 feet (1.8 meters) nor contact any lower level;

4.6.9.3 Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters); and

4.6.9.4 Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 meters) or the free fall distance permitted by the system, whichever is less.

4.6.9.5 Have proper anchorage points used for attachment of personal fall arrest equipment capable of supporting at least 5,000 pounds per employee attached.

5. Site Specific Fall Protection Plan

Where it is not feasible to use conventional fall protection equipment, a site specific fall protection plan will be developed by a qualified person that addresses the fall hazards of the specific site and work areas.

6. Inspection and Maintenance.

To ensure that fall protection systems are ready and able to perform their required tasks, inspections and maintenance will be conducted. The following as a minimum, will comprise the basic requirements of the inspection and maintenance program:

6.1 Floor hole covers, guardrails, and warning lines will be inspected periodically throughout the day to ensure they have not been defected, broken, moved, or knocked over. Any problems found with them should be reported immediately to the Supervisor and must be remedied as soon as possible after discovery. Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.

6.2 Fall arrest systems must be inspected by the user before, after every use, and according to manufacturer's specifications.

6.3 Any fall protection equipment subjected to a fall or impact load will be removed from service immediately and turned into the Supervisor and/or Safety Manager.

6.4 The user will inspect anchors and mountings before each use for signs of damage.

7. Rescue

Pre-planning shall be conducted to identify resources for prompt rescue of employees in the event of a fall and if an employee cannot perform a self-rescue. This should be outlined in the Pre-Job Fall Protection Site Safety Plan. The rescue plan shall be established by the project management team and safety department which will include the designated personnel assigned to assist, contact name & numbers and the safest method to conduct a prompt rescue.

8. Accident Investigation

A complete accident investigation shall be performed by the project management team and or safety department in the event of a fall, near miss or other serious event to identify the root cause and establish controls to prevent a reoccurrence.

9. Definitions.

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Body belt means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent person means a person who is capable of identifying hazardous or dangerous conditions in any personal fall arrest system or any component thereof, as well as in their application and use with related equipment.

Connector means a device, which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system.

Deceleration device means any mechanism with a maximum length of 3.5 feet, such as a rope grab, rip stitch lanyard, tearing or deforming lanyards, self-retracting lifelines, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Energy shock absorber means a device that limits shock-load forces on the body.

***Failure* means** load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall arrest system means a system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
Free fall distance means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

***Lanyard* means** a flexible line of rope, wire rope, or strap, which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Snaphook means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types:

1. The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
2. The non-locking type with a self-closing keeper, which remains closed until, pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking

snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Toeboard means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Walking/Working surface means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Work area means that portion of a walking/working surface where job duties are being performed.

FLEX-ERECT

SECTION 15

SUBJECT: Stairway & Ladder Safety Program.

REGULATORY STANDARDS: OSHA 29 CFR 1910.24 -.27
OSHA 29 CFR 1926 Subpart X

GENERAL: Flex-Erect attempts to ensure that all potential hazards regarding Stairways and Ladders used within our facility(s) and work sites are evaluated. This program is intended to address the issues of evaluating and identifying potential deficiencies, evaluating the associated potential hazards, communicating information concerning these hazards, and establishing appropriate procedures, and protective measures for employees using ladders.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received training before assignment to work.

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STAIRWAY AND LADDER SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, or operational changes occur that require a revision of this document.

2. Training Requirements.

Flex-Erect will provide training to ensure our employees know the purpose, function, and proper use of ladders & stairs and that they have the knowledge and skills required for the safe application, and usage of ladders.

2.1 Training will be arranged by the Safety Manager or other designated competent personnel. The program will include but will not be limited to:

- 2.1.1 OSHA Safety Regulations
- 2.1.2 Recognition and description of ladder/stairway hazards in the work area.
- 2.1.3 Types of ladders & appropriate use as required by the manufacturer.
- 2.1.4 Ladder inspection & maintenance requirements.

2.2 Certification. Flex-Erect will verify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training.

2.3 Retraining. Refresher training will be conducted periodically and when the following conditions are met.

- 2.3.1 Retraining will be provided for all affected employees whenever a known hazard is added to the work environment.
- 2.3.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of ladders or stairways.
- 2.3.3 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

3. Stairway Safety.

3.1 All stairways shall be kept clean, orderly, and free of known hazards.

3.2 Cleaning requirements. To facilitate cleaning, all stairways shall be kept free from protruding nails, splinters, holes, or loose boards or other hindrances that would prevent efficient maintenance.

3.3 Stairways leading to work stations shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places will be provided where practicable.

3.4 Stairways leading to emergency exit doors will be kept free of obstructions at all times. Any employee finding an emergency route blocked should immediately report the condition to

the Supervisor for correction. Exit lights and signs will also be maintained in proper condition at all times and immediately reported if deficient.

3.5 Illumination. Sufficient illumination will be provided in all areas at all times especially where stairways and ladders are in use.

3.6 Stair treads. All treads shall be reasonably slip-resistant and the nosing shall be of nonslip finish. Welded bar grating treads without nosing are acceptable providing the leading edge can be readily identified by personnel descending the stairway and provided the tread is serrated or is of definite nonslip design. Rise height and tread width shall be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

4. Ladder Safety.

To ensure safety and serviceability the following precautions concerning the care and use of ladders will be observed:

4.1 Care. The following safety precautions shall be observed in connection with the care of ladders:

4.1.1 Ladders shall have the safety capacity placards legible and intact. The ladder shall have the correct load capacity for the task.

4.1.2 Ladders shall be maintained in good condition at all times, the joint between the steps and side rails shall be tight, all hardware and fittings securely attached, and the movable parts shall operate freely without binding or undue play.

4.1.3 Metal bearings of locks, wheels, pulleys, etc., shall be frequently lubricated.

4.1.4 Frayed or badly worn rope shall be replaced.

4.1.5 Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.

4.1.6 Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use."

4.1.7 Rungs should be kept free of grease and oil. Ladder rungs must be uniformly spaced or meet OSHA/ANSI & the Manufacturer specifications.

4.2 Use. The following safety precautions shall be observed in connection with the use of ladders:

4.2.1 The ladder shall be used for its intended purpose and designed as required by the manufacturer.

4.2.2 Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held in position.

4.2.3 Ladders shall not be used in a horizontal position as platforms, runways, or

scaffolds.

4.2.4 Ladders for which dimensions are specified should not be used by more than one man at a time or with ladder jacks and scaffold planks.

4.2.5 Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load.

4.2.6 Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked upon, locked, or guarded.

4.2.7 Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.

4.2.8 Ladders will not be used on top of scaffolds.

4.2.9 Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made.

4.2.10 Short ladders shall not be spliced together to provide long sections.

4.2.11 Ladders made by fastening cleats across a single rail shall not be used.

4.2.12 Ladders shall not be used as guys, braces, or skids, or for other than their intended purposes.

4.2.13 Tops of the ordinary types of stepladders shall not be used as steps.

4.2.14 Portable rung ladders with reinforced rails shall only be used with the metal reinforcement on the under side.

4.2.15 No ladder should be used to gain access to a roof or another level unless the top of the ladder shall extend at least 3 feet above the point of support, at eaves, gutter, or roofline.

4.2.16 Middle and top sections of sectional or window cleaner's ladders should not be used for bottom section unless they are equipped with safety shoes.

4.2.17 All portable rung ladders will be equipped with nonslip bases when there is a hazard of slipping. Nonslip bases are not intended as a substitute for care in safely placing, lashing, or holding a ladder that is being used upon oily, metal, concrete, or slippery surfaces.

4.2.18 The bracing on the back legs of stepladders is designed solely for increasing stability and not for climbing.

5. Inspections

The employee using the ladder shall conduct a visual inspection to ensure safety and serviceability before every use. Ladders will be maintained in a good usable condition at all times. Defective ladders are to be removed from and tagged out of service immediately.

6. Definitions

Cleat means a ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.

Double-cleat ladder means a ladder similar in construction to a single-cleat ladder, but with a

center rail to allow simultaneous two-way traffic for employees ascending or descending.

Equivalent means alternative designs, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees than the methodoritem specified in the standard.

Extension trestle ladder means a self-supporting portable ladder, adjustable in length consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.

Failure means load refusal, breakage or separation of component parts. Load refusal is the point where the structural members lose their ability to carry the loads.

Fixed-ladder means a ladder that cannot be readily moved or carried because it is an integral part of a building or structure. A side-step fixed ladder is a fixed ladder that requires a person getting off at the top to step to the side of the ladder side rails to reach the landing. A *through fixed ladder* is a fixed ladder that requires a person getting off at the top to step between the side rails of the ladder to reach the landing.

Handrail means a rail used to provide employees with a handhold for support.

Job-made ladder means a ladder that is fabricated by employees, typically at the construction site, and is not commercially manufactured. This definition does not apply to any individual-rung/step ladders.

Lower levels means those areas to which an employee can fall from a stairway or ladder. Such areas include ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, material, water, equipment, and similar surfaces. It does not include the surface from which the employee falls.

Maximum intended load means the total load of all employees, equipment, tools, materials, transmitted loads, and other loads anticipated to be applied to a ladder component at any one time.

Point of access means all areas used by employees for work related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls, and various other permanent or temporary openings used for such travel.

Portable ladder means a ladder that can be readily moved or carried.

Riser height means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

Single-cleat ladder means a ladder consisting of a pair of side rails, connected together by cleats, rungs, or steps.

Stair rail system means a vertical barrier erected along the unprotected sides and edges of a

stairway to prevent employees from falling to lower levels. The top surface of a stair rail system may also be a "handrail."

Tread depth means the horizontal distance from front to back of a tread (excluding nosing, if any).

Unprotected sides and edges means any side or edge (except at entrances to points of access) of a stairway where there is no stair rail system or wall 36 inches (.9 m) or more in height, and any side or edge (except at entrances to points of access) of a stairway landing, or ladder platform where there is no wall or guardrail system 39 inches (1 m) or more in height.

FLEX-ERECT

SECTION 16

SUBJECT: Scaffold Safety Program

REGULATORY STANDARDS: OSHA - 29 CFR 1926 Subpart L

GENERAL: Flex-Erect attempts to ensure that the hazards associated with scaffold use are evaluated and that information concerning their hazards is transmitted to all employees. This Program is intended to address the issues of evaluating these potential hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received proper scaffold training before working from scaffolds.

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SCAFFOLD SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, when operational changes occur that require a revision of this document, or when there is an accident or near miss that relates to this area of safety.

2. Scaffold Safety Training Requirements.

Our employees who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. Supervisors will ensure that all employees have been trained prior to working from the scaffolds.

2.1 Scaffold Use. The training will include the following areas as applicable:

- 2.1.1 The nature of and the correct procedures for dealing with electrical hazards.
- 2.1.2 The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
- 2.1.3 The proper use of the scaffold and the proper handling of materials on the scaffold.
- 2.1.4 The maximum intended load and the load-carrying capacities of the scaffolds used.
- 2.1.5 Any other pertinent requirements of the OSHA rules description of fall hazards in the work area or job site.
- 2.1.6 Procedures for using fall prevention and protection systems including falling objects.
- 2.1.7 Scaffolding access and egress procedures.
- 2.1.8 Scaffolding equipment limitations and specifications per the manufacturer.
- 2.1.9 Inspection procedures for the equipment.

2.2 Scaffold Erection/ Dismantling. Our employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolding shall be trained by a competent or qualified person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

- 2.2.1 The nature of the scaffold hazards.
- 2.2.2 The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
- 2.2.3 Any other pertinent requirements.

2.3 Certification. Flex-Erect will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be conducted by the Safety Manager or other designated competent person.

2.4 Refresher Training. Refresher training will be conducted on an as needed basis or whenever there is a change in the type of scaffolding equipment used, or when a known hazard is added to the work environment which affects this program.

2.5 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of scaffolding equipment or procedures.

3. Competent and Qualified Persons.

When working with scaffolds in this company there are some tasks that must be done by a competent person or a qualified person. By definition they are:

3.1 Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3.2 Qualified Person: One who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work being performed or the project.

3.3 Competent Person Requirements.

3.3.1 Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.

3.3.2 The Competent Person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence, which could affect a scaffold's structural integrity. Damaged scaffold components shall be removed from service immediately and a “Do Not Use” Tag shall be placed on them.

3.3.3 We will not intermix scaffold components manufactured by different manufacturers unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components manufactured by different manufacturers will not be modified in order to intermix them unless our competent person determines the resulting scaffold is structurally sound.

3.3.4 Before a suspension scaffold is used, direct connections must be evaluated by a competent person who will confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed.

3.3.5 Prior to each work shift and after every occurrence, which could affect a rope's integrity, suspension scaffolds will be inspected by a competent person. Ropes will be replaced if any of the visible damage/ conditions exist.

3.3.6 Scaffolds will be erected, moved, dismantled, or altered only under the supervision and direction of a competent person.

3.4 Qualified Person:

3.4.1 Scaffolds must be designed by a qualified person and shall be constructed and loaded in accordance with that design.

3.4.2 We will have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.

4. Falling Object Protection.

All employees must wear hardhats when working on, assembling, or dismantling scaffolds. This is our primary protection from falling objects. Additionally, Supervisors will ensure:

4.1 All guardrail systems are installed with openings small enough to prevent passage of potential falling objects.

4.2 Tools, materials, or equipment are prevented from inadvertently falling from scaffolds.

5. Fall Protection.

Our fall protection plan follows OSHA requirements, which depend on the type of scaffold that is used. Unless otherwise specified by the Safety Manager or manufacturer, fall protection will be used by any employee on a scaffold more than 10 feet above a lower level.

5.1 Guardrails must be used with self-contained adjustable scaffolds supported by the frame structure. The guardrail system must meet the minimum requirements as identified in the Flex-Erect's Fall Protection Program.

6. General Scaffold Safety Guidelines.

The following general safety procedures apply to all scaffold operations for Flex-Erect.

6.1 Taking into account the OSHA rules we must apply and the engineering/manufacturing requirements of our scaffolds, the following rules apply.

6.1.1 Each scaffold and scaffold component we use will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.

6.1.2 When we use non-adjustable suspension scaffolds, each suspension rope, including connecting hardware, will support, without failure, at least six times the maximum intended load applied or transmitted to that rope.

6.2 Gaining Access to Scaffolds. Supervisors will ensure that all employees are provided with safe access to working platforms.

6.2.1.1 Scaffold platforms more than 2 feet (0.6 m) above or below a point of access shall be equipped with a portable ladder, hook-on ladder, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface shall be used.

Cross braces shall not be used as a means of access.

6.2.1.2 Portable, hook-on and attachable ladders will be used and positioned so as not to tip the scaffold.

6.2.1.3 When hook-on and attachable ladders are used on a supported scaffold more than 35 feet (10.7 m) high, they shall have rest platforms at 35-foot (10.7 m) maximum vertical intervals.

6.2.1.4 All stair rail system with will be installed according to manufacturer specifications and will be surfaced to prevent injury to our employees from punctures or lacerations, and to prevent snagging of their clothes.

6.3 Platforms. The following safety rules apply for scaffold platforms:

6.3.1 Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports.

6.3.2 Each scaffold plank will be installed so that the space between adjacent planks and the space between the platform and uprights is no more than one inch wide.

6.3.3 Scaffold platforms and scaffold components will never be loaded in excess of their maximum intended loads or rated capacities.

6.3.4 Unstable objects shall not be used as working platforms.

6.3.5 All platforms, other than those on outrigger scaffolds or where lathing operations are performed, will be constructed with no more than 14 inches from the face of the work. The only other excerption is when a proper guardrail or personal fall arrest system is used in accordance with the Flex-Erect's Fall Protection Program. Outrigger scaffolds will have a maximum of 3 inches and plastering and lathing operations will use a maximum of 18 inches from the front edge of work.

6.3.6 Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches (15 cm). Each end of a platform 10 feet or less in length shall not extend over its support more than 12 inches (30 cm) unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end. Each platform greater than 10 feet in length shall not extend over its support more than 18 inches (46 cm), unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end.

6.3.7 On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. This provision does not preclude the use of common support members, such as "T" sections, to support abutting planks, or hook on platforms designed to rest on common supports.

6.3.8 On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.

6.3.9 At all points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.

6.3.10 Debris must not be allowed to accumulate on platforms.

6.4 Guying & Tying Scaffolding. The following safety rules apply:

6.4.1 Supported Scaffolding

6.4.1.1 Supported scaffolds with a height base width ratio of more than four to one (4:1) must be restrained from tipping by guying, tying, bracing, or equivalent means.

6.4.1.2 Guys, ties, and braces shall be installed at locations where horizontal members support both inner and outer legs.

6.4.1.3 Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1 m) or less thereafter for scaffolds 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less thereafter for scaffolds greater than 3 feet (0.91 m) wide. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) (measured from one end [not both] towards the other).

6.4.1.4 Supported scaffold poles, legs, posts, frames, and uprights will always bare on base plates and mudsills or other adequate firm foundations.

6.4.1.5 Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.

6.4.1.6 Unstable objects shall not be used to support scaffolds or platform units.

6.4.1.7 Supported scaffold poles, legs, posts, frames, and uprights shall be plumb and braced to prevent swaying and displacement.

6.4.2 Suspension Scaffolds.

6.4.2.1 Before a suspension scaffold is used, all direct connections will be evaluated by the Supervisor or other designated competent person. The competent person will confirm based on the evaluation, which of the supporting surfaces, are capable of supporting the loads that will be imposed.

6.4.2.2 All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).

6.4.2.3 Suspension scaffold outrigger beams, when used, shall be made of structural metal or equivalent strength material, and shall be restrained to prevent movement.

6.4.2.4 The inboard ends of suspension scaffold outrigger beams shall be stabilized by bolts or other direct connections to the floor or roof deck, or they shall have their inboard ends stabilized by counterweights, except masons' multi-point adjustable suspension scaffold outrigger beams shall not be stabilized by counterweight

6.4.2.5 Before the scaffold is used, direct connections shall be evaluated by a competent person who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multi-point adjustable suspension scaffold connections shall be designed by an engineer experienced in such scaffold design.

6.4.2.6 Counterweights shall be made of non-flowable material. Sand, gravel and similar materials that can be easily dislocated shall not be used as counterweights.

6.4.2.7 Only those items specifically designed as counterweights shall be used to counterweight scaffold systems. Construction materials such as, but not limited to, masonry units and rolls of roofing felt, shall not be used as counterweights.

6.4.2.8 Counterweights shall be secured by mechanical means to the outrigger beams to prevent accidental displacement.

6.4.2.9 Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.

6.4.2.10 Outrigger beams which are not stabilized by bolts or other direct connections to the floor or roof deck shall be secured by tiebacks.

6.4.2.11 Tiebacks shall be equivalent in strength to the suspension ropes.

6.4.2.12 Outrigger beams shall be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the employer can demonstrate that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be

placed at some other angle, provided opposing angle tiebacks are used.

6.4.2.13 Tiebacks shall be secured to a structurally sound anchorage on the building or structure. Sound anchorages include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.

6.4.2.14 Tiebacks shall be installed perpendicular to the face of the building or structure, or opposing angle tiebacks shall be installed. Single tiebacks installed at an angle are prohibited.

7. Specific Procedures.

In addition to the general procedures in this written safety plan, there are procedures that apply to specific types of scaffolds.

7.1 Perry/ Baker Scaffolds may be used by Flex-Erect employees. The following minimum guidelines provided by the manufacturer will be followed:

7.1.1 Perry/ Baker scaffolds will not be constructed higher than 18 feet high.

7.1.2 The scaffold will not be moved while personnel are on the scaffold.

7.1.3 Perry scaffolds must be used indoors and on level surfaces. They may be used on limited basis outdoors if the floor surface is flat/level and solid such as concrete pad.

7.1.4 Employees are prohibited from placing a ladder on top of the Perry scaffold.

7.2 Stilts may be used by Flex-Erect employees. The following minimum guidelines will be followed:

7.2.1 Stilts shall be properly maintained. Alterations of the original equipment are prohibited.

7.2.2 Work Area Inspection. Surfaces on which stilts are used shall be flat and free of pits, holes and obstructions, such as debris, as well as other tripping and falling hazards. A work areas inspection shall be conducted prior to using stilts.

7.2.3 When an employee is using stilts on a large area scaffold (Dance Floor) or near a leading edge where a guardrail system is used to provide fall protection, the guardrail system shall be increased in height by an amount equal to the height of the stilts being used by the employee.

8. Inspections.

Site preparation, scaffold erection, fall protection, and gaining access to the working platform are only part of the requirements for scaffold work. The designated Competent Person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence, which could affect a scaffold's structural integrity. Damaged scaffold components shall be removed from service immediately and a “Do Not Use” Tag shall be placed on them.

9. Prohibited Practices The following practices are prohibited:

9.1 Scaffold components manufactured by different manufacturers will never be intermixed

unless the components fit together without force and the scaffold's structural integrity is maintained.

9.2 Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.

9.3 Cross-braces will never be used as a means of access.

9.4 The use of shore or lean-to scaffolds is prohibited.

10. Definitions.

Body belt (safety belt) means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means a design of straps which may be secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system. *Brace* means a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Deceleration device means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline lanyard, which dissipates a substantial amount of energy during a fall arrest or limits the energy imposed on an employee during fall arrest.

Equivalent means alternative designs, materials or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Exposed power lines means electrical power lines which are accessible to employees and which are not shielded from contact. Such lines do not include extension cords or power tool cords.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Guardrail system means a vertical barrier, consisting of, but not limited to, toprails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway to lower levels.

Hoist means a manual or power-operated mechanical device to raise or lower a suspended scaffold.

Large area scaffold means a pole scaffold, tube and coupler scaffold, systems scaffold, or fabricated frame scaffold erected over substantially the entire work area. For example: a scaffold erected over the entire floor area of a room.

Lifeline means a component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Lower levels means areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

Maximum intended load means the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

Mobile scaffold means a powered or unpowered, portable, caster or wheel-mounted supported scaffold.

Open sides and ends means the edges of a platform that are more than 14 inches (36 cm) away horizontally from a sturdy, continuous, vertical surface (such as a building wall) or a sturdy, continuous horizontal surface (such as a floor), or a point of access. Exception: For plastering and lathing operations the horizontal threshold distance is 18 inches (46 cm).

Outrigger means the structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for and increased stability of the scaffold.

Outrigger scaffold means a supported scaffold consisting of a platform resting on outrigger beams (thrustouts) projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside the building or structure.

Personal fall arrest system means a system used to arrest an employee's fall. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or combinations of these.

Platform means a work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Power operated hoist means a hoist which is powered by other than human energy.

Qualified means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Rated load means the manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

Scaffold means any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees or materials or both.

Stair tower *(Scaffold stairway/tower)* means a tower comprised of scaffold components and which contains internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as floors and roofs.

Stilts means a pair of poles or similar supports with raised footrests, used to permit walking above the ground or working surface.

Supported scaffold means one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Tubular welded frame scaffold (see "Fabricated frame scaffold").

Unstable objects means items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects do not constitute a safe base support for scaffolds, platforms, or employees. Examples include, but are not limited to, barrels, boxes, loose brick, and concrete blocks.

Walkway means a portion of a scaffold platform used only for access and not as a work level.

11. Forms.

#	Form Name	Page #
1	**Competent Person Authorization**	**12**
2	**Scaffold Inspection Form**	**14**

Designated Competent Person Acknowledgement Form

OSHA'S Definition of a Competent Person
One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Requirement
The Flex-Erect's designated competent person shall be onsite with Flex-Erect personnel at all time when scaffolding is being erected / dismantled and or in use. If the competent person is required to leave the site, the company shall designate a secondary competent person to remain on site with the crew or the work shall be stopped until the competent person returns. This form shall be completed by an officer of our company.

Responsibility
The designated competent person is responsible for recognizing and correcting safety hazards associated with scaffold used on our jobsite. The designated competent person shall also inspect the scaffold systems daily prior to allowing Flex-Erect personnel to occupy them.

Our designated competent person shall also be responsible for the following:

- Only allowing Flex-Erect personnel to use the scaffold system.
- Not allow other contractor personnel to use the scaffold system unless prior approval is provided by the Flex-Erect project management team.
- Require the use of personal fall protection equipment in areas on the scaffold where fall protection is required due to temporary platform/ scaffold component removal.
- Verify all site personnel working on the scaffold system have scaffold user safety training.
- Verify all site personnel working on the scaffold system are equipped and use the required personal protective equipment.
- Verify all equipment & tools that will be used by our personnel on scaffolding system are inspected prior to use and maintained in good condition.
- Verify that falling object protection is installed to protect ground personnel walking/working in close proximity to the scaffold.
- Report near miss, property damage and personnel incidents that might occur to the site project management team immediately.

Acknowledgment – Company Officer

I, _____ Officer of the Company (Print Name) representing, Flex-Erect has designated the personnel listed below as our competent person for this project. I acknowledge that this individual meets OSHA's Competent Person requirements. I also acknowledge that this individual has the authority to stop work and correct hazards associated with our scope of work.

Acknowledgment – Designated Competent Person

I acknowledge that I understand my responsibility as the designated competent person for this site. I also understand that I have the authority to stop work and correct safety hazards associated with our scope of work.

I hereby accept the responsibility and duties for the position of competent person, and agree to conduct these functions to the best of my ability, taking in to consideration the safety of the employees under my direct supervision and myself.

_____ _____

Competent Person (Print Name) Competent Person (Signature)

_____ _____

Contact Phone Number Date

Authorization- Company Officer

I hereby attest that the information contained in this form is true, complete and correct to the best of my knowledge and authorize_____ (Print Competent Person's Name) to represent our company as the designated competent person for this work site.

_____ _____

Company Officer (Print Name) Company Officer (Signature)

_____ _____

Contact Phone Number Date

Scaffold Inspection Form

Site Supervisor: _____ Date: _____

Scaffold Location: _____

Answer each question with either a “y-yes” or “n-no”, if there are any “no” answers, scaffold must be unoccupied and removed from service. Explain any “no” answers on the back. **Note**: If you have more than one scaffold set-up, EACH set-up requires an inspection report.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Date of Inspection:						
Safety Training Requirements						
1. Are all personnel building the scaffold “Builder” trained?						
2. Are all personnel working on the scaffold “User” Trained?						
Prior to Erecting the Scaffolding						
1. Is the competent person present?						
2. Are the scaffold components in good condition?						
3. Scaffolds equipped with adequate footing (screw legs/base plates)?						
4. Does the ground appear to be stable?						
5. Are the scaffold components compatible?						
6. Are there any overhead power line near the work area?						
7. Do you have adequate ladder(s) for egress?						
8. Are environmental conditions a factor? (i.e. wind, rain, lighting, etc.)						
Inspection Prior to Use of the Scaffolding						
1. Are scaffolds plumb, level and braced to prevent swaying?						
2. Are all X-Braces secured by a locking mechanism on each end?						
3. Are all vertical ties secure and in proper placement (4 x the width)?						
4. Are the working level platforms completely decked out?						
5. Scaffold platforms fully planked with less than 1" spacing?						
6. Are all platforms at least 18" wide?						
7. Do all scaffold boards extend a minimum of 6” past the frames?						
8. Where planks overlapped, are they lapped over scaffold supports						
9. Are planks overlapped at least 12" and secure?						
10. Are proper ladders used for type of scaffold used?						
11. Are rest platforms provided every 35' of height?						
12. Are open sides of scaffold less than 14" from face of work?						
13. Are toe boards at least 3 1/2" in height and in place?						
14. Are co-workers on ground protected from falling objects?						
15. Are guardrails installed at 38" to 45" in height?						
16. Are mid rails installed at midway from boards to top rail?						
17. Does entire guardrail system meet strength requirements?						
18. Are excess materials such as trash and debris moved daily?						

19. When the guardrail is removed, is a safety harness used?						
20. Are all scaffolds tagged properly?						
22.**Competent Person Name**: Initials						

#	Scaffold Safety Deficiencies Observed
#	**Corrective Measures**

FLEX-ERECT

SECTION 17

SUBJECT: Aerial Work Platform Safety Program

REGULATORY STANDARDS: OSHA - 29 CFR 1926 Subpart L- Aerial Work Platforms Manufacturer Requirements

GENERAL: Flex-Erect attempts to ensure that the hazards with all elevated work platform operations are evaluated, and that information concerning their hazards is transmitted to all employees. This Program is intended to address the issues of evaluating the operation of aerial work platforms including scissor lifts and aerial boom lifts, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors will ensure their employees are aware of the contents of this program and have received proper aerial lift training before operating the equipment.

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6	Aerial Work Platform Fall Protection Requirements	4
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AERIAL WORK PLATFORM SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations, when operational changes occur that require a revision of this document, or when there is an accident or near miss that relates to this area of safety.

2. Aerial Work Platform Operator Safety Training Requirements.

Flex-Erect authorized employees whom perform work on aerial work platforms will be trained by a qualified person to recognize the hazards associated with the type of equipment being used and to understand the procedures to control or minimize those hazards. Supervisors will ensure that all employees have been trained prior to operating aerial work platforms.

2.1 The training will include the following areas as applicable:

- 2.1.1 Manufacturer Guidelines & Recommendations which include maintenance requirements.
- 2.1.2 The nature of and the correct procedures for inspecting the aerial work platforms prior to use.
- 2.1.3 The nature of and the correct procedures for inspecting the work area prior to operation.
- 2.1.4 The nature of and the correct procedures for conducting function testing of the equipment prior to operation.
- 2.1.5 The proper use of the aerial work platforms and the proper operation of the specific equipment.
- 2.1.6 Any other pertinent requirements of the OSHA/ Manufacturer guidelines.
- 2.1.7 Manufacturer / OSHA Fall Protection Requirements. Procedures for using fall restraint and protection systems.
- 2.1.8 Aerial Work Platform Shutdown procedures.
- 2.1.9 Emergency Response Procedures

2.2 Aerial Work Platform Use. The training will also include the following areas as applicable.

- 2.2.1 Work Area assessment which will include the nature of and the correct procedures for dealing with electrical hazards, and environmental conditions
- 2.2.2 The nature of and the correct procedures for inspecting, and maintaining the aerial lifts used.
- 2.2.3 The proper use and operation of the aerial lifts.
- 2.2.4 The maximum intended load and the load-carrying capacities of the aerial lifts used.
- 2.2.5 Any other pertinent requirements of the OSHA rules description of fall hazards in the work area or job site.
- 2.2.6 Procedures for using fall prevention and protection systems.
- 2.2.7 Aerial lift access and egress procedures.

2.2.8 Aerial lift equipment limitations and specifications per the manufacturer.

2.2.9 Pre- operation inspection and storage procedures for the equipment.

2.3 Certification. Flex-Erect will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be conducted by the Safety Coordinator or designated qualified person.

2.4 Refresher Training. Refresher training will be conducted on an as needed basis or whenever there is a change in the type of equipment used, or when a known hazard is added to the work environment which affects this program.

2.5 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the equipment or procedures.

3. General Aerial Work Platform Safety Procedures

The following general procedures apply to all aerial work platform operations for Flex-Erect.

3.1 Taking into account the OSHA rules we must apply and the engineering/ manufacturing requirements of aerial work platforms the following rules apply:

3.1.1 Flex-Erect operators shall ensure that the aerial work platforms meet the manufacturer and OSHA safety requirements prior to operating the equipment at the work site by conducting a pre-operation inspection.

3.2 Platforms. The following safety rules apply for aerial work platforms:

3.2.1 The operator shall be familiar with the aerial work platforms weight capacity and personnel limits.

4. Specific Aerial Work Platform Safety Procedures

Anytime aerial lifts, including extensible boom platforms, aerial ladders, articulating boom platforms, or vertical towers are used to elevate employees to jobsites above ground, the following safety rules will apply:

4.1 No employee shall operate any type of lift unless properly trained in the operation and inspection before operation of Aerial Lifts, and the employee must carry proof of training on him at all times while operation of the lift takes place.

4.2 All lifts shall be inspected by our operator before each shift to determine that such lift is in safe working condition. Check lift controls for proper functioning, tire pressure (if the lift has inflated tires), make sure the lift has no leaks of any fluids, and make sure the operators manual is on the lift at all times during operation.

4.3 All employees shall stand firmly on the floor of the basket or platform, and shall not sit or climb on the edge of the basket or use planks, ladders or other devices for a work position.

4.4 No aerial lift provided shall be "field modified" for uses other than those intended by the manufacturer.

4.5 Aerial work platforms shall not be operated near energized power lines. The maximum approach distance to a power line of 50 kilovolts or less is 10 ft. If the operator does not know the voltage, the maximum approach distance is 20 ft.

4.6 Aerial lift trucks shall not be moved when the boom is elevated in a working position with the workers in the basket, except for equipment that is specifically designed for this type of operation.

4.7 All lifts must be equipped with functional motion alarm audible above the surrounding noise level to warn personnel working in the immediate work area when the equipment is in motion. A ground spotter shall be designated for tight quartered/ high traffic work areas as required.

4.8 Ladder Trucks and Tower Trucks. Aerial ladders must be secured in the lower traveling position by the locking device on top of the truck cab, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

5. Protection from Falling Objects.

All employees must wear hardhats when working in the field. This is our primary protection from falling objects. Additionally Supervisors will ensure:

5.1 Employees working under or in close proximity (7m/21 feet) from aerial work platforms will only do so when the aerial work platform is NOT in use.

5.2 Tools, materials, or equipment are secured to prevent from inadvertently falling from the aerial work platforms.

5.3 The aerial work platform personnel baskets shall also be equipped with a toe board as part of the manufactured guardrail system.

5.4 The work areas will be barricaded to keep non-essential workers and contractors out of the work areas as needed.

5.5 Ground monitors will be designated in high traffic or high hazard areas. The ground monitor will use the ground controls on the lift if the personnel in the basket become unable to for any reason. The monitor has to maintain line of sight and be capable of promptly getting to controls in case of an emergency situation

6. Aerial Work Platform Fall Protection Requirements.

The personnel basket manufactured guardrail system is the primary means of fall protection for the operator.

6.1 The guard rail system shall not be modified or removed at anytime when in use.

6.2 The guard rail (toe board, mid rail or top rail) system shall not be used to access additional working heights. The operators shall keep their feet planted on the work platform at all time.

6.3 **Aerial Boom Lift Fall Protection Requirements:** A full body harness shall be worn and attached to the basket when working from an aerial boom lift. Body belts are prohibited. The aerial boom lift will be equipped with a designated anchor point (check the operator's manual for location of this anchorage point). Do not tie-off to an adjacent pole, structure, or equipment while working from an aerial boom lift. The operator shall be protected from falling to the lower level and also from being ejected from the basket. Proper Fall Protection would be a restraint system or retractable lanyard.

6.4 **Scissor Lift Fall Protection Requirements:** A fall restraint shall be worn and attached to the basket when working from a scissor lift. Body belts are prohibited. The scissor lift will be equipped with a designated anchor point (check the operator's manual for location of this anchorage point). Do not tie-off to an adjacent pole, structure, or equipment while working on a scissor lift. The platform guardrail system is the primary means of fall protection.

7. Aerial Work Platform Pre-Operation Inspection.

The aerial work platform operator shall conduct an inspection of the work area and equipment prior to operation daily. The operator shall also conduct a function test of the equipment prior to operation. Work area hazards and/ or visual defects of the equipment shall be reported to Flex-Erect's site supervisor immediately. The pre-operation inspection shall be documented on projects that require documented inspections. The inspection shall be documented using our aerial work platform inspection form. The pre-operation inspection shall include but not limited to:

Pre-Operation Inspection- Work Area:

- Ground Conditions
- Environmental Conditions (i.e. wind, rain, lighting, etc.)
- Overhead Power lines
- Contractors working in close proximity or in the same work area
- Working in close proximity to equipment, storage tanks, etc.

Pre- Operation Inspection- Aerial Work Platform:

- Manufacturer Operator & Safety Manuals
- Tires
- Hydraulic- Fluids & Lines
- Lights
- Braking System
- Structural Components
- Engine Compartment/ Components
- Electrical Wiring
- Work Platform Guardrail System. Tie Off Points
- Work Platform Access

- Manufacturer Safety Placards

Pre- Operation Inspection- Aerial Work Platform Function Test:

- Operational Controls- **Base & Work Platform**
- Hydraulic Controls
- Emergency Stop
- Motion Alarm
- Lights

8. Emergency Response Procedures

If an emergency or incident occurs while the aerial work platform is in operation, Flex-Erect employees shall:

1. Stop all operations in the immediate work area and secure the scene. Only approach involved/ injured personnel if it is safe to do so;
2. Provide 1st Aid and notify your supervisor immediately;
3. Contact emergency services if the injured requires medical attention;
4. Once steps 1-3 are complete, Flex-Erect personnel will immediately call and notify the Flex-Erect safety director or project manager who will initiate further reporting requirements and investigation procedures.

Note: If the aerial work platform is in contact with an overhead electrical power line, assume the lift is energized and do not touch it.

If the aerial work platform is elevated and the operator is unconscious/ non-responsive, conduct an area assessment and if it is safe do so, bring the platform down using the base controls or the manual hydraulic pressure release located at the base of the aerial work platform. Refer to the manufacturer's operator's manual. Ground personnel shall be trained in the use of the auxiliary controls and manual descent functions of the aerial work platforms.

9. Prohibited Practices.

The following practices are prohibited:

9.1 **Modifications**. No aerial lift this company uses will be "field modified" for uses other than those intended by the manufacturer unless: (1) the manufacturer certifies the modification in writing, or (2) any other equivalent entity, such as a nationally recognized testing lab, certifies the aerial lift modification conforms to all applicable provisions of ANSI A92.2-1969, and OSHA rules at 1926.453 The lift must be at least as safe as the equipment was before modification.

9.2 **Equipment Use & Capacity.** The aerial work platforms shall not be used for work outside of

its design and the rated load capacity shall not be exceeded at any time.

9.3 **Unauthorized Use.** Personnel that has not been trained and authorized by the company shall not operate aerial work platforms at any time. Contractor and Subcontractor personnel shall not operate Flex-Erect aerial work platforms unless written approval has been granted by the project management team and or safety department.

10. Definitions.

Body belt (safety belt) means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means a design of straps which may be secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system. *Brace* means a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Deceleration device means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline lanyard, which dissipates a substantial amount of energy during a fall arrest or limits the energy imposed on an employee during fall arrest.

Equivalent means alternative designs, materials or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Power Lines means electrical power lines which are accessible to employees and which are not shielded from contact. Such lines do not include extension cords or power tool cords.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Guardrail system means a vertical barrier, consisting of, but not limited to, toprails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway to lower levels.

Lower levels means areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

Maximum intended load means the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

Personal fall arrest system means a system used to arrest an employee's fall. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device,

lifeline, or combinations of these.

Prohibited means to forbid an action, activity, etc. by authority or by law.

Qualified means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Rated load means the manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

11. Forms.

#	Form Name	Page #
1	**Pre-Use Inspection for All Terrain Forklift Form**	**9**
2	**Pre-Use Inspection for Aerial Boom Lift Form**	**10**
3	**Pre-Use Inspection for Aerial Scissor Lift Form**	**11**

FLEX-ERECT

SECTION 18

SUBJECT: Powered Industrial Truck Safety Program.

REGULATORY STANDARD: OSHA - 29 CFR 1910.178
OSHA - 29 CFR 1926

GENERAL: Flex-Erect attempts to ensure that the requirements of the OSHA Standard for powered industrial trucks, specifically All Terrain Forklifts, will be adhered to by its employees. This program is intended to address the issues of employee training, authorization, safety requirements, fire protection, maintenance, and general operation of fork trucks, platform lift trucks, and other specialized industrial trucks used within our jobsites.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received training before assignment to work.

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8	Modifications/Labels	7
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Powered Industrial Truck Safety Program

1. Written Program.

Flex-Erect will review and evaluate this program periodically, and when changes occur to the regulations, or when operational changes occur that requires a revision of this document.

2. Training Program.

2.1 Operator training. Only trained and authorized operators will be permitted to operate a powered industrial truck. The training will include formal instruction lecture, discussion, videos, and written materials. The practical training will involve instructor demonstrations and trainee exercises. All operator training and evaluations will be conducted by a designated/ qualified person who has the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence. Employees will be trained in accordance with the following guidelines.

2.1.1 The company Safety Administrator, individual supervisor, or select trainers, (once trained) will have the authority to provide training on the operation of powered industrial trucks.

2.1.2 Employees of Flex-Erect will not operate a powered industrial truck (PIT) unless they have received training in accordance with this program and 29 CFR 1910.178.

2.1.3 Personnel rotated within the company will have their training verified prior to being allowed to operate a PIT.

2.1.4 Employee personnel records will be annotated with the date, title, and specifics of said training.

2.1.5 The training shall include operating instructions, controls, capacity/stability, refueling, load stability, etc.

2.1.6 Any employee who refuses such training will not be permitted to operate a PIT.

2.2 Trainees may operate a powered industrial truck only:

2.2.1 Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

2.2.2 Where such operation does not endanger the trainee or other employees.

2.3 Retraining will be provided for all operators:

2.3.1 Refresher training in relevant topics will be provided to the operator when:

2.3.2 The operator has been observed to operate the vehicle in an unsafe manner;

2.3.3 The operator has been involved in an accident or near-miss incident;

2.3.4 The operator has received an evaluation that reveals that the operator is not operating the truck safely;

2.3.5 The operator is assigned to drive a different type of truck; or

2.3.6 A condition in the workplace changes in a manner that could affect safe operation of the truck.

2.3.7 Every three years.

2.4 Avoidance of duplicative training. If an operator has previously received training in a topic specified in paragraph 29 CFR 1910.178, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

2.5 Retraining will reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

2.6 Certification. This employer will verify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training and any other information as required.

3. General Requirements.

3.1 Trucks will not be driven up to anyone standing in front of a fixed object.

3.2 No person will be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

3.3 Unauthorized personnel will not be permitted to ride on powered industrial trucks. A safe place to ride will be provided where riding of trucks is authorized.

3.4 Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the truck.

3.5 When a powered industrial truck is left unattended, load-engaging means will be fully lowered, controls will be neutralized, power shut off, and brakes set. Wheels will be blocked if the truck is parked on an incline.

3.5.1 A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle, which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

3.5.2 When the operator is dismounted and within 25 ft. of the truck still in his view, the load engaging means will be fully lowered, controls neutralized, and the brakes set to prevent movement.

3.6 A safe distance will be maintained from the edge of ramps or platforms while on any elevated dock, platform, or freight car. Trucks will not be used for opening or closing freight doors.

3.7 Brakes will be set and wheel blocks in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars will be checked for breaks and weakness before they are driven onto.

3.8 The operator will ensure sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc. before operating the vehicle in these areas.

3.9 An overhead guard will be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small objects representative of the job application, but not to withstand the impact of a falling capacity load.

3.10 Whenever a truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the following additional precautions will be taken for the protection of personnel being elevated.

- 3.10.1 Use of a safety platform firmly secured to the lifting carriage and/or forks.
- 3.10.2 Means will be provided whereby personnel on the platform can shut off power to the truck.
- 3.10.3 Such protection from falling objects, as indicated necessary by the operating conditions would be provided.

3.11 Fire aisles, access to stairways, and fire equipment will be not be obstructed at any time.

3.12 Operators:

- 3.12.1 Will obey Plant/Site speeds and other traffic regulations at all times.
- 3.12.2 Will operate loaded trucks with forks no more than 6-8 inches above the ground, with the load carried low and tilted back.
- 3.12.3 Will not raise or lower loads while moving.
- 3.12.4 Will not carry anything on the overhead guard.
- 3.12.5 Will use all plant/Site observation mirrors
- 3.12.6 Will ensure vehicle sound/illuminated warning devices are operational.
- 3.12.7 Will yield right of way to pedestrians, emergency vehicles, and avoid pedestrian lanes.
- 3.12.8 Will drive cautiously on uneven or slippery surfaces.
- 3.12.9 Will ensure the load is pointed uphill where the gradient is greater than 10 percent.
- 3.12.10 Will ensure fire protection equipment is carried with the vehicle and is in proper working order.

4. Pre-Start Requirements.

Powered Industrial Truck operator will follow these minimum guidelines.

Operators:

4.1 Will verify that all brakes, controls, gauges, lights, seat belts, and routine operational features are in proper working order. They will be examined before and after each shift. Defects when found will be immediately reported and corrected.

4.2 Will remove the truck from service any time it is found to be in need of repair, defective, or in any way unsafe, the truck will be taken out of service until it has been restored to safe operating condition.

4.3 Will check for leaks and perform necessary operator maintenance before starting vehicle.

4.4 Will report deficiencies to their Supervisor or Safety Manager.

4.5 Will ensure they know the load capacity and stay within it.

4.6 Will be cognizant of the planned route and aware of areas with inadequate headroom, lighting, obstructions, and floor surface problems.

4.7 Will wear the same level of personal protective equipment as the personnel they are directly working with.

4.8 Will not engage in stunt driving or horseplay.

4.9 Will slow down for wet and slippery floors.

4.10 Will properly secure dockboard or bridgeplates before they are driven over. Dockboard or bridgeplates will be driven over carefully and slowly and their rated capacity never exceeded.

4.11 Will approach any elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, the controls will be neutralized, power shut off, and the brakes set until the desired level is reached.

4.12 Motorized hand trucks must enter elevators or other confined areas with load end forward.

4.13 Running over loose objects on the roadway surface will be avoided.

4.14 While negotiating turns, speed will be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel will be turned at a moderate, even rate.

4.15 Will use extreme care tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated will be prohibited except to pick up a load. An elevated load will not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load will be used.

5. Loading/Unloading Requirements.

Operators must follow these minimum requirements, they:

5.1 Will ensure load is within the trucks rated capacity.

5.2 Will place load squarely on forks until load touches carriage.

5.3 Will ensure load is stable and centered on forks, and stack or tie loose or uneven loads (or ensure proper personnel accomplish this prior to loading).

5.4 Will secure the vehicle when not in use to prevent unauthorized personnel from operating the vehicle.

5.5 Will tilt the mast back to lift load.

5.6 Will proceed straight into trailers or railcars to load/unload.

5.7 Will ensure if loading/unloading onto trucks or trailers that the wheels are chocked, brakes are engaged, and loading platform is positioned properly.

5.8 Will ensure if loading/unloading onto or from racks the proper safe weight or height-to-load ratio is maintained.

5.9 Will ensure if loading/unloading onto or from stacked materials the proper safe weight or height-to-load ratio is maintained.

6. Parking Requirements.

When parking, operators:

6.1 Must select flat parking surfaces, away from traffic where the vehicle does not block doors, pedestrian routes, aisles, exits, etc.

6.2 Must not leave a truck unattended or be more than 25 feet from the vehicle without:

6.3 Fully lowering load-engaging means, neutralizing controls, shutting off power, setting the brakes, and removing the keys.

6.3.1 Blocking the wheels if parked on an incline.

7. Refueling Requirements.

7.1 Refuel only in assigned, ventilated areas containing no ignition sources.

7.2 Turn off engine.

7.3 Have fire suppression and cleanup equipment available.

7.4 Extinguish smoking materials.

7.5 Use acid-resistant material-handling equipment and wear corrosion-resistant PPE during battery charging/changing.

7.5.1 Remove battery cap slowly and leave open.

7.5.2 Pour acid into water, not water into acid.

7.5.3 Follow the vehicle manufacturer's instructions for gas or propane fueling.

7.5.4 Never use open flame to check fuel level.

7.5.5 Try to prevent spills, clean any spills promptly, replace fuel cap before starting or moving vehicle.

7.5.6 Store empty propane tanks in the designated container disposal/storage area located at the jobsite or main office.

7.6 Spilled electrolyte. Facilities will be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

7.7 Battery maintenance requirements. Reinstalled batteries will be properly positioned and secured in the truck. A carboy tilter or siphon will be provided for handling electrolyte. When charging batteries, acid will be poured into water; water will not be poured into acid. Trucks will be properly positioned and brake applied before attempting to change or charge batteries. Care will be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) will be open to dissipate heat. Smoking will be prohibited in the charging area. Precautions will be taken to prevent open flames, sparks, or electric arcs in battery charging areas. Tools and other metallic objects will be kept away from the top of uncovered batteries.

8. Modifications/Labels.

8.1 No modifications or additions, that affect capacity and safe operation, will be performed without the manufacturers prior written approval. Capacity, operation, maintenance instruction plates, tags, or decals will be changed accordingly.

8.2 If the truck is equipped with front-end attachments other than factory-installed attachments, the truck will be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

8.3 All nameplates and markings will be verified as being in place and maintained in a legible condition.

9. Forms

#	Form Name	Page #
1	**Pre-Use Inspection All Terrain Forklift**	**8**

FLEX-ERECT

SECTION 19

SUBJECT: Welding & Cutting Safety Program

REGULATORY STANDARDS: OSHA 29 CFR 1910.251 – 252
OSHA 29 CFR 1926 Subpart J

GENERAL: Flex-Erect attempts to ensure that the hazards associated with welding and cutting operations at our jobsites are evaluated, and that information concerning these hazards is transmitted to all employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the training before being allowed to perform welding or cutting operations. Subcontractors are required to provide written documentation of welding and cutting operations that meet or exceed these requirements.

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WELDING AND CUTTING SAFETY PROGRAM

1. Written Program.

These written Welding & Cutting Procedures establish guidelines to be followed whenever employees of Flex-Erect perform any welding or cutting operations. Subcontractors performing welding and cutting operations must have written documentation that meets or exceeds these requirements. Flex-Erect will review and evaluate this program periodically, and when changes occur to the regulations, when operational changes occur that require a revision of this document, when there is an accident or near miss that relates to this area of safety, or any time these procedures fail.

2. Training.

It is the policy of Flex-Erect permit only trained and authorized personnel to operate welding and cutting equipment. Subcontractors will be responsible for training their employees.

2.1 Instructors will have the necessary knowledge, training, and experience to train new welding and cutting equipment operators.

2.2 Initial Training. All welders and cutters must be trained and tested on the equipment they will be operating before they begin their job. Training must cover the operational hazards of welding and cutting operations, including:

- 2.2.1 Hazards associated with the particular make and model of the welding and cutting equipment;
- 2.2.2 Hazards of the workplace; and
- 2.2.3 General hazards that apply to the operation of all or most welding and cutting equipment.

2.3 Each potential welder or cutter who has received training in any of the elements for the types of equipment which that employee will be authorized to operate need not be retrained in those elements before initial assignment in our workplace. The Safety Manager of Flex-Erect will obtain has written documentation of the training and Supervisors will ensure that the employee is evaluated to be competent.

2.4 After an employee has completed the training program, the instructor will determine whether the potential welder or cutter can safely perform the job. At that point, the trainee will take a performance test or practical exercise through which the instructor(s) will decide if the training has been adequate. All welding and cutting trainees will be tested on the equipment they will be operating.

2.5 Certification. Flex-Erect will verify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training.

2.6 Retraining. Refresher training will be conducted periodically. Retraining will also occur when the following conditions are met.

- 2.6.1 Retraining will be provided for all authorized and affected employees whenever a known hazard is added to the work environment.
- 2.6.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever Flex-Erect has reason to believe, that there are deviations

from or inadequacies in the employee's knowledge.

3. Fire prevention and protection.

Fire and explosion pose a serious risk to our employees during welding, cutting, and brazing operations. Sparks can travel as much as 35 feet, and spatter can bounce on the floor or fall through openings creating hazards in other work areas of our facility.

3.1 Basic safety precautions. Cutting or welding will be permitted only in areas that are or have been made fire safe. When work cannot be moved practically, as in most construction work, the area will be made safe by removing combustibles or protecting combustibles from ignition sources. The below listed basic safety precautions will be followed by company employee's performing welding, cutting, and brazing operations. The basic precautions for fire prevention in welding or cutting work are:

3.1.1 Fire hazards. If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity will be taken to a safe place.

3.1.2 Guards. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards will be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

3.1.3 Fire extinguishers. Suitable fire extinguishing equipment will be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

3.1.4 Combustible material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions will be taken so that no readily combustible materials on the floor below will be exposed to sparks that might drop through the floor. The same precautions will be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

3.1.5 Fire watch. Firewatchers will be required as indicated by the Safety Manager. Firewatchers will have fire-extinguishing equipment readily available and be trained in its use. They will be familiar with facilities for sounding an alarm in the event of a fire. They will watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch will be maintained for at least a half-hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

3.1.6 Authorization. Employees performing welding and cutting operations must obtain authorization from their Supervisor. Where required, employees will fill out a Hot Work permit as required.

3.1.7 Prohibited areas. Cutting or welding will not be permitted in the following situations:

3.1.7.1 In areas not authorized by management.

3.1.7.2 In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that

may develop in areas with an accumulation of combustible dusts.

3.1.7.3 In areas near the storage of large quantities of exposed, readily ignitable materials such as flammable liquids, baled paper, or cotton.

3.1.8 Relocation of combustibles. Where practicable, all combustibles will be relocated at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles will be protected with flameproofed covers or otherwise shielded with guards or curtains.

3.1.9 Combustible walls. Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards will be provided to prevent ignition.

4. Operating Procedures.

All employees have a general obligation to work safely with and around welding and cutting operations. Welding and cutting can create certain hazards that only safe work practices can prevent. Subcontractors must supply Flex-Erect with their operating procedures before work begins.

4.1 Ventilation and/or Respiratory Requirements: In the event that any welding, cutting, and/or burning of lead based metals, zinc cadmium, mercury, beryllium or exotic metals or paints not listed here shall have proper ventilation, respiratory protection, or utilization of fume extractor equipment.

5. Handling Cylinders.

The following minimum requirements must be followed when handling cylinders:

5.1 Valve protection caps will be in place and secured.

5.2 When cylinders are hoisted, they will be secured on a cradle, slingboard, or pallet. They will not be hoisted or transported by means of magnets or choker slings.

5.3 Cylinders will be moved by tilting and rolling them on their bottom edges. They will not be intentionally dropped, struck, or permitted to strike each other violently.

5.4 When cylinders are transported by powered vehicles, they will be secured in a vertical position.

5.5 Valve protection caps will not be used for lifting cylinders from one vertical position to another.

5.6 Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators will be removed and valve protection caps put in place before cylinders are moved.

5.7 A suitable cylinder truck, chain, or other steadying device will be used to keep cylinders from being knocked over while in use.

5.8 When work is finished, when cylinders are empty, or when cylinders are moved at any time, the cylinder valve will be closed.

5.9 Compressed gas cylinders will be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

5.10 Oxygen cylinders in storage will be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet (6.1 m) or by a noncombustible barrier at least 5 feet (1.5 m) high having a fire-resistance rating of at least one-half hour.

5.11 Inside of buildings, cylinders will be stored in a well-protected, well-ventilated, dry location, at least 20 feet (6.1 m) from highly combustible materials such as oil or excelsior. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage places will be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders will not be kept in unventilated enclosures such as lockers and cupboards.

6. Inspections.

The Safety Manager, Supervisor, or designated employee will conduct an inspection of all equipment and the area. Inspections will be documented on the Hot Work (Welding and Cutting) Safety form

7. Maintenance.

Any deficiencies found in welding and cutting equipment must be repaired, or defective parts replaced, before continued use. However, modifications or additions that affect the capacity or safe operation of the equipment may not be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly. In no case may the original safety factor of the equipment be reduced.

8. Signs and Labels.

Signs and labels must be posted in plain view when welding or cutting operations are being performed.

9. Forms.

#	Form Name	Page #
1	**Hot Work Permit**	**6**

HOT-WORK PERMIT

NOTE: Hot-Work will be performed only after a careful and complete review of all safety precautions and site preparation actions have proven it safe to begin work.

Hot Work Location**:** _____

Date: Start Time:

Person Conducting the Hot Work: Contact:

Describe Hot Work to be Conducted**:**_____

_____

_____

What is the primary ignition source? _____

Explain the measure implemented to control the heat source. _____

_____

Name of Fire Watch:_____ Contact Number:_____

Hot Work Safety Requirements

IF EMERGENCY OCCURS CALL:	
CONTACT NUMBER:	

HOT WORK SAFETY CHECKLIST

WORK CANNOT BEGIN UNTIL THE FOLLOWING SAFETY PRECAUTIONS HAVE BEEN COMPLETED

Safety Requirements	Completed	
1. **The location of the work to be done will be examined.**		
Are Sprinklers operational and will remain operable until the work is completed?	☐ Yes	☐
Have all flammable dusts, lint, vapors or liquids been cleared from the hot work area?	☐ Yes	☐
Have all un-purged tanks or equipment previously containing flammable material been	☐ Yes	☐
Will the work be confined to the area specified in this permit?	☐ Yes	☐
2. **The following safeguards will be provided.**		
Have all floors and surroundings been swept clean and wet down?	☐ Yes	☐
Has ample portable fire extinguishing equipment been provided and strategically located?	☐ Yes	☐
3. **If the work involves spark producing equipment the following will been done.**		
Have all combustibles been located 30 to 40 feet from the operation?	☐ Yes	☐
Have all non-moveable combustibles been protected with fireproof curtains, flameproof	☐ Yes	☐
4. **Has flame- or spark-producing equipment been inspected & in good repair?**	☐ Yes	☐
5. **Have arrangements been made for area patrol, including above and below floors, during rest periods and for at least one half hour after work completion?**	☐ Yes	☐ No
6. **Were there any "no" answers in questions 1-5?**	☐ Yes	☐

* IF YES--REPORT TO YOUR SUPERVISOR - DO NOT PERFORM HOT-WORK!

FLEX-ERECT

SECTION 20

SUBJECT: Steel Erection Safety Program.

REGULATORY STANDARD: OSHA - 29 CFR

GENERAL: Flex-Erect attempts to ensure that the requirements of the OSHA Standard for Steel Erection will be adhered to by its employees. This program is intended to address the issues of employee training, authorization, safety requirements, fire protection, maintenance, and the general steel erection sequence within our jobsites.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as a representative of Flex-Erect, who has the ultimate responsibility of all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the required safety training before working in any areas where hazards exist.

Section	Contents of the Confined Space Entry Program	Page
1	Written Program	2
2	Specific Responsibilities	2
3	Training Requirements	2
4	Controlling Contractor Responsibilities	3
5	Fall Protection	3
6	Steel Erection	5
7	Definitions	7

NOTE: Steel erection activities include hoisting, laying out, placing, connecting, welding, sealing, caulking, burning, guying, bracing, bolting, plumbing, and rigging structural steel, steel joists and metal buildings; installing metal decking, curtain walls, window walls, siding systems, lift slab/tilt-up structures, miscellaneous metals, ornamental iron and similar materials; and moving point-to-point while performing these activities.

STEEL ERECTION PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to 29 CFR 1926, that prompt revision of this document, or when operational changes occur that require a revision of this document.

2. Specific Responsibilities:

2.1 Safety Manager. The company's Safety Manager will be responsible to ensure that all subcontractors performing steel erection submit a copy of their written steel erection safety program and if requested, copies of documentation of training prior to beginning work.

2.2 Supervisors. Company Supervisors are responsible for developing a site steel erection plan prior to commencing work. Supervisors will notify the Safety Manager immediately if there is any doubt as to the designation of a work area where steel erection work will take place.

2.2.1 Training Verification: The site supervisor will verify that each person participating in the steel erection has documentation of training prior to commencing work.

3. Training Requirements:

3.1 Training personnel. Training required by this section shall be provided by a qualified person(s).

3.2 Fall hazard training. The employer shall provide a training program for all employees exposed to fall hazards. The program shall include training and instruction in the following areas:

3.3 The recognition and identification of fall hazards in the work area;

3.4 The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other protection to be used;

3.5 The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;

3.6 The procedures to be followed to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls; and

3.7 The fall protection requirements of this Safety Program

3.8 Special training programs. In addition to the training required, Flex-Erect will provide special training to employees engaged in the following activities.

(1) Multiple lift rigging procedure. The employer shall ensure that each employee who performs multiple lift rigging has been provided training in the following areas:

(i) The nature of the hazards associated with multiple lifts; and

(ii) The proper procedures and equipment to perform multiple lifts required by §1926.753(e).

(2) Connector procedures. The employer shall ensure that each connector has been provided training in the following areas:

(i) The nature of the hazards associated with connecting; and

(ii) The establishment, access, proper connecting techniques and work practices required by §1926.756(c) and § (b).

(3) Controlled Decking Zone Procedures. Where CDZs are being used, the employer shall assure that each employee has been provided training in the following areas:

(i) The nature of the hazards associated with work within a controlled decking zone; and

(ii) The establishment, access, proper installation techniques and work practices required by § (c) and §1926.754(e)

4. Controlling Contractor Responsibilities

4.1 Site layout, site-specific erection plan, and construction sequence

(i) Approval to begin steel erection. Before authorizing the commencement of steel erection, the controlling contractor shall ensure that the steel erector is provided with the following written notifications:

(ii) The concrete in the footings, piers and walls and the mortar in the masonry piers and walls shall attain, on the basis of an appropriate ASTM standard test method of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

(iii) Any repairs, replacements and modifications to the anchor bolts shall be conducted in accordance with §1926.755(b).

(iv) Site layout. The controlling contractor shall ensure that the following is provided and maintained:

(v) Adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control. Exception: this requirement does not apply to roads outside of the construction site.

(vi) A firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment.

5. Fall Protection

(1) Each employee engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet (4.6 m) above a lower level shall be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

(2) Perimeter safety cables. On multi-story structures, perimeter safety cables shall be installed at the final interior and exterior perimeters of the floors as soon as the metal decking has been installed on the top and midrail.

(3) Connectors and employees working in controlled decking zones shall be protected from fall hazards.

Connectors. Each connector shall:

(1) Be protected from fall hazards of more than two stories or 30 feet (9.1 m) above a lower level, whichever is less;

(2) Have completed connector training in accordance with §1926.761; and

(3) Be provided, at heights over 15 and up to 30 feet above a lower level, with a personal fall arrest system, positioning device system or fall restraint system and wear the equipment necessary to be able to be tied off; or be provided with other means of protection from fall hazards

Controlled Decking Zone (CDZ). A controlled decking zone may be established in that area of the structure over 15 and up to 30 feet above a lower level where metal decking is initially being installed and forms the leading edge of a work area. In each CDZ, the following shall apply:

(1) Each employee working at the leading edge in a CDZ shall be protected from fall hazards of more than two stories or 30 feet (9.1 m), whichever is less.

(2) Access to a CDZ shall be limited to only those employees engaged in leading edge work.

(3) The boundaries of a CDZ shall be designated and clearly marked. The CDZ shall not be more than 90 feet (27.4 m) wide and 90 (27.4 m) feet deep from any leading edge. The CDZ shall be marked by the use of control lines or the equivalent.

(4) Each employee working in a CDZ shall have completed CDZ training in accordance with §1926.761.

(5) Unsecured decking in a CDZ shall not exceed 3,000 square feet (914.4 m2).

(6) Safety deck attachments shall be performed in the CDZ from the leading edge back to the control line and shall have at least two attachments for each metal decking panel.

(7) Final deck attachments and installation of shear connectors shall not be performed in the CDZ.

Criteria for Fall Protection Equipment.

(1) Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems and their components shall conform to the criteria in §1926.502.

(2) Fall arrest system components shall be used in fall restraint systems and shall conform to the criteria in §1926.502. Either body belts or body harnesses shall be used in fall restraint systems.

(3) Perimeter safety cables shall meet the criteria for guardrail systems in §1926.502.

Custody of fall protection. Fall protection provided by the steel erector shall remain in the area where steel erection activity has been completed, to be used by other trades, only if the controlling contractor or its authorized representative

(1) Has directed the steel erector to leave the fall protection in place; and

(2) Has inspected and accepted control and responsibility of the fall protection prior to authorizing persons other than steel erectors to work in the area.

Falling Object Protection

(a) Securing loose items aloft. All materials, equipment, and tools, which are not in use while aloft, shall be secured against accidental displacement.

(b) Protection from falling objects other than materials being hoisted. The controlling contractor shall bar other construction processes below steel erection unless overhead protection for the employees below is provided.

6. Steel Erection

6.1 Hoisting and Rigging

Working under loads

A. Routes for suspended loads shall be pre-planned to ensure that no employee is required to work directly below a suspended load except for:

(i) Employees engaged in the initial connection of the steel; or

(ii) Employees necessary for the hooking or unhooking of the load.

B. When working under suspended loads, the following criteria shall be met:

(i) Materials being hoisted shall be rigged to prevent unintentional displacement;

(ii) Hooks with self-closing safety latches or their equivalent shall be used to prevent components from slipping out of the hook; and

(iii) All loads shall be rigged by a qualified rigger.

6.2 Structural Steel Assembly

A. Structural stability shall be maintained at all times during the erection process.

B. The following additional requirements shall apply for multi-story structures:

(1) The permanent floors shall be installed as the erection of structural members progresses, and there shall be not more than eight stories between the erection floor and the upper-most permanent floor, except where the structural integrity is maintained as a result of the design.

(2) At no time shall there be more than four floors or 48 feet (14.6 m), whichever is less, of unfinished bolting or welding above the foundation or uppermost permanently secured floor, except where the structural integrity is maintained as a result of the design.

(3) A fully planked or decked floor or nets shall be maintained within two stories or 30 feet (9.1 m), whichever is less, directly under any erection work being performed.

(4) Roof and floor holes and openings. Metal decking at roof and floor holes and openings shall be installed as follows:

(i) Framed metal deck openings shall have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructability.

(ii) Roof and floor holes and openings shall be decked over. Where large size, configuration or other structural design does not allow openings to be decked

over (such as elevator shafts, stair wells, etc.) employees shall be protected with guardrails.

(iii) Metal decking holes and openings shall not be cut until immediately prior to being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements or shall be immediately covered.

(5) Covering roof and floor openings.

(i) Covers for roof and floor openings shall be capable of supporting, without failure, twice the weight of the employees, equipment and materials that may be imposed on the cover at any one time.

(ii) All covers shall be secured when installed to prevent accidental displacement by the wind, equipment or employees.

(iii) All covers shall be painted with high-visibility paint or shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

(iv) Smoke dome or skylight fixtures that have been installed, are not considered covers for the purpose of this section unless they meet the strength requirements.

(6) Decking gaps around columns. Wire mesh, exterior plywood, or equivalent, shall be installed around columns where planks or metal decking do not fit tightly. The materials used must be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

(7) Installation of metal decking.

(i) Except as provided in §1926.760(c), metal decking shall be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

(ii) During initial placement, metal decking panels shall be placed to ensure full support by structural members.

6.3 Column Anchorage

A. General requirements for erection stability.

(1) All columns shall be anchored by a minimum of 4 anchor rods (anchor bolts).

6.4 Beams and Columns

A. A competent person shall determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they shall be installed.

B. Column splices. Each column splice shall be designed to resist a minimum eccentric gravity load of 300 pounds (136.2 kg) located 18 inches (.46 m) from the extreme outer face of the column in each direction at the top of the column shaft.

6.5 Open Web Steel Joists

(3) Hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted, and each end of the bottom chord is restrained by the column stabilizer plate.

(i) Each end of "K" series steel joists shall be attached to the support structure with a minimum of two -inch (3 mm) fillet welds 1 inch (25 mm) long or with two ½-inch (13 mm) bolts, or the equivalent.

(iv) Panels that have been pre-assembled from steel joists with bridging shall be attached to the structure at each corner before the hoisting cables are released.

6.6 Landing and Placing Loads.

(1) During the construction period, the employer placing a load on steel joists shall ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.

(2) Except for paragraph (e)(4) of this section, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

7. Definitions.

Competent Person means one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measure to eliminate them.

Connector means an employee who, working with hoisting equipment, is placing and connecting structural members and/or components.

Controlled Decking Zone (CDZ) means an area in which certain work (for example, initial installation and placement of metal decking) may take place without the use of guardrail systems, personal fall arrest systems, fall restraint systems, or safety net systems and where access to the zone is controlled.

Controlling Contractor means a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project – its planning, quality and completion

Double Connection means an attachment method where the connection point is intended for two pieces of steel which share common bolts on either side of a central piece

Fall Restraint System means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.

Leading Edge means the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as deck) which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed.

Metal Decking means a commercially manufactured, structural grade, cold rolled metal panel formed into a series of parallel ribs; this includes metal floor and roof decks, standing seam metal roofs, other metal roof systems and other products such as bar gratings, checker plate, expanded metal panels, and similar products. After installation and proper fastening, these decking materials serve a combination of functions including, but not limited to: a structural element designed in combination with the structure to resist, distribute and transfer loads, stiffen the structure and provide a diaphragm action; a walking/working surface; a form for concentrate slabs; a support for roofing systems; and a finished floor or roof.

Multiple Lift Rigging means a rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to five independent loads to the hoist rigging of a crane.

Project Structural Engineer of Record means the registered, licensed professional responsible for the design of structural steel framing and whose seal appears on the structural contract documents.

Qualified person means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.
Steel Erection means the construction, alteration or repair of steel buildings, bridges and other structures, including the installation of metal decking and all planking used during the process of erection.

Unprotected sides and edges means any side or edge (except at entrances to points of access) of a walking/working surface, for example a, floor, roof, ramp or runway, where there is no wall or guardrail system at least 39 inches (1.0 m) high.

FLEX-ERECT

SECTION 21

SUBJECT: Rigging &Signal Communication Safety Program.

REGULATORY STANDARD: OSHA - 29 CFR 1910.180
OSHA - 29 CFR 1926. 251

GENERAL: Flex-Erect attempts to ensure the requirements of the OSHA Standard for Rigging & Signal Communications are adhered to by its employees. This program is intended to address the issues of employee training, authorization and safety requirements when conducting Rigging & Signal Communication.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as a representative of Flex-Erect, who has the ultimate responsibility of all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the required safety training before working in any areas where hazards exist.

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Rigging & Signal Communication Safety Program

1. Written Program.

Flex-Erect will review and evaluate this program periodically, and when changes occur to the regulations, or when operational changes occur that requires a revision of this document.

2. Training Program.

2.1 Operator training. Only employees trained and authorized by the company will be permitted to perform rigging & signal communication. All personnel will be trained and evaluated by the Safety Manager or designated persons who have the knowledge, training, and experience to train Communication and evaluate their competence. Employees will be trained in accordance with the following guidelines.

2.1.1 The company Safety Administrator or individual authorized by the company will have the authority to Rigging & Signal Communication Safety Training

2.1.2 Employees of Flex-Erect will not conduct rigging & signal communication unless they have received training in accordance with this program.

2.1.3 Personnel rotated within the company will have their training verified prior to being allowed to conduct rigging or signal communication.

2.1.4 Employee personnel records will be annotated with the date, title, and specifics of said training.

2.1.5 Any employee who refuses such training will not be permitted to conduct rigging or signal communication.

2.2 Retraining will be provided for all personnel:

2.2.1 Refresher training in relevant topics will be provided to the personnel when:

2.2.2 Personnel has performed rigging or signal communication in an unsafe manner;

2.2.3 Personnel has been involved in an accident or near-miss incident;

2.2.4 An evaluation reveals that the personnel is not performing rigging or signal communication safely;

2.2.5 A condition in the workplace or the rigging equipment changes in a manner that could affect the safe operation.

2.3 Retraining will reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

2.4 Certification. This employer will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training and any other information as required.

3. Responsibilities

Site Manager / Supervisor

The Site Manager must assume ownership and responsibility for implementation of the requirements found in this program.

Supervisors responsible for employees performing work covered by this SHE Program must:

Ensure employees have been trained in rigging techniques and requirements of this SHE Program.

Continuously monitor the work to assure all rigging activities are being conducted in accordance with this program.

Employee

Employees must receive training on rigging techniques, and perform all rigging activities according to training and instructions received.

Safety Department

The Safety Department will assist Site Management in compliance with this program, as well as provide the expertise necessary to ensure successful implementation of the overall program.

4. Inspection and Storage

Inspection

All rigging, slings and wire rope shall be inspected prior to initial field usage (includes new/purchased equipment) and prior to use on each shift, and as necessary during its use to ensure that it is safe. Defective rigging shall be removed from service immediately and replaced. One of the difficult problems confronting the inspector is deciding just when a wire rope has reached the limit of its safe usage and when it must be discarded. Naturally, it is poor economy to discard an expensive hoisting rope before it is necessary. Likewise, it is dangerous, and may prove even more expensive, to continue its use beyond a certain stage.

The following illustrates the major classification of wire rope abuses. The effects and causes are not complete but serve to indicate general areas where most damaging situations exist.

EFFECT	CAUSE
Crushed or Bruised	Crossover on drums, Poor drum winding practices, Pinching of rope, Peening against equipment
Doglegs and Kinks	Jumping sheaves, Operating over small diameter sheaves, Pulling out loops in line when slack, causing either open or tight kinks, Lifting sharp cornered objects without corner protection, Bad drum winding, Dividers on drums
Corrosion and Rust	Lack of lubrication, Corrosive fluids, Atmosphere
Popped Core	Momentary compressive force on rope which pushes strands apart, Hitting the fluid in a well at high speed, Bending over small sheaves, Crushing on drum
Excessive Abrasion	Improper reeving, Pinching grooves, Improper alignment of sheaves, Presence of abrasive material

EFFECT	CAUSE
Broken Wires	Fatigue from excessive bending over small sheaves. Martensite developed from sliding or striking rope against some object that causes sparking. Surface wear (creep), Collapse of core due to overloading, Either small sheaves or reverse bends, Restriction of movement of strands due to pinching grooves, Vibrations set up by faulty bearings, Broken sheaves or drums, Excessive rope speeds
Bird Caged	Too sudden release of load
High Strands	Condition starts at some localized area such as dog leg, crushed section, improperly attached end fittings or splices
Failure at Socket	Poor socket design, wrong size wedge used or socket, Deformed from consistent overloading
Marked Reduction	Excessive abrasion Diameter, External or internal corrosion, Overloading
Cut or Sheared Wires	Mechanical abuse caused by agents outside the installation or by something abnormal or accidental on the installation itself.
Slide Wear on Rope	Rope operated with sheaves or drums out of proper alignment
Overstressing	Sudden application of load to slack rope, Too rapid acceleration of load, Jerking, Impact from sudden stopping the load
Increase in Lay	Overloading, Load allowed rotating freely

Rigging Equipment Storage

All rigging equipment when not in use shall be removed from the work area and stored in a designated location away from the site & environmental elements that can damage the equipment. The rigging equipment shall not be stored in gang boxes with other tools where damage can occur.

5. Rigging General Safety Rules

Employees performing rigging tasks shall do so in the manner specified by this Safety Program in an effort to eliminate any potential incidents in this area. This SHE Program provides the minimum procedures when employees perform rigging tasks and applies to all employees and subcontractors engaged in operations covered by the Safety Program.

The rigging equipment shall be protected from abrasive, sharp or acute edges and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. The rigging equipment shall be inspected, used, stored & maintained per the manufacturer specifications. All rigging equipment shall be equipped with the manufacturer identification tags. The rigging work shall be performed by a qualified rigger.

Lifting with Hoisting Equipment (Do's and Don'ts)

DO'S	DON'TS
DO give safety first consideration in all handling of materials.	DON'T neglect to put safety first in all material handling.
DO know weight of piece being lifted	DON'T lift a piece without knowing its weight.
DO know capacity of lifting equipment in the method it is to be used.	DON'T make a lift without knowing capacity of lifting equipment and the method it is to be used.
DO familiarize yourself with types of slings available for easiest and safest lifting.	DON'T try to make one type of sling do everything.
DO inspect lifting equipment before and after it is used to make certain it is in good condition.	DON'T take maintenance inspection for granted.
DO report any lifting equipment that appears to be unsafe.	DON'T leave lifting equipment that appears to be unsafe where someone else can use it.
DO remove from service any damaged lifting equipment so it cannot be used to make another lift.	DON'T use lifting equipment that is damaged to lift loads lower in capacity than the original rate capacity on the equipment.
DO report all incidents causing damage, even to lifting equipment, operating equipment and products.	DON'T neglect to report incidents though you might feel there was no danger.
DO store lifting equipment in proper racks and places so it does not become damaged.	DON'T leave lifting equipment at locations where it can be accidentally damaged by bending, cutting, or crushing.

Proper Use of Chain and Wire Rope Slings (DO'S and DON'TS)

DO'S	DON'TS
DO protect sling form cutting action in making lift by using padding, blocks, or corner protectors.	DON'T subject sling to cutting action by making contact with sharp edges.
DO avoid tip loading hooks	DON'T point load (tip load) standard sling hooks.

DO choose a sling one size larger where conditions will subject the sling to severe wear, abrasion, impact, or corrosive conditions.	DON'T underestimate the conditions a sling might be subjected to.
DO select the proper style hook or Appendices.	DON'T subject hooks or Appendices to a bending action.
DO stand clear while a sling is being drawn form beneath a load. Hooks and slings may catch and suddenly spring free or tip the load.	DON'T let the load lay directly on a sling wrapped around a load (lower the load on proper blocking).
DO, when making choker hitches, always face the hook opening out and away from the pull of the sling.	DON'T assume in a choker hitch that the hook is going to stay in place when slack is being taken out of the sling

Note: **Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees.**

Fittings & Hooks, (DO'S and DON'TS)

DO'S	**DON'TS**
DO check fittings for cracks, nicks, bending, or excessive wear.	DON'T use any fitting that shows cracks, nicks, bending, or excessive wear.
DO check the hook throat opening to determine if the hook has been point loaded or overloaded.	DON'T use a hook that appears to have been spread open. Increase in hook opening should be reported and hook removed from service.
DO avoid tip-loading hooks.	DON'T ever point load a standard eye hook or sling hook. (This reduces the safe working load drastically.)

DO'S	**DON'TS**
DO not use any hook that has been welded or burned in any way. Report the condition immediately.	DON'T weld anything to a hook.

Note: **Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used**

Shackles

DO'S	**DON'TS**

DO make certain the bolt in a screw pin shackle turns easily, and then tighten it. (Use oil on the threads.)	DON'T use any screw pin shackle where the bolt is very difficult to turn. (The pin is either bent due to overload or the threads have been damaged.)
DO use nylon slings in the presence of oils, greases, hydrocarbon and degreasing solutions.	DON'T use nylon slings at temperatures above 250 degrees Fahrenheit.
DO inspect hoist hooks to make certain they are smooth.	DON'T use nylon slings on hoist hooks that are gouged or nicked.

6. Rigging General Precautions

Know the safe working capacity of all rigging and equipment. Do not exceed this limit.

Know the load weight - this includes the weight of the rigging. Avoid sudden snatching, swinging, or stopping of loads.

Inspect all rigging before use and remove any defective equipment from service.

When the temperature is below freezing, extreme caution must be exercised to prevent shock loading any rigging. Brittle fracture of the steel can occur at these temperatures.

The most frequent killer in the rigging department is electrocution caused by contacting overhead power lines. Always maintain at least a (10) ten foot working distance from any power line. Discontinue operations during thunderstorms.

Always keep the load line plumb to maintain a stable load.

When using slings:

Never use a kinked or otherwise damaged sling.

Each sling should be marked with its rated capacity.

Never sharply bend a sling, it will kink it. Permanently weakening it.

When two or more eyes are placed over a hook, use a shackle with the shackle pin resting on the load hook. This prevents the sling legs from opening the hook.

Loads must be kept under control at all times. Tag lines should be used to stop spinning or guide the load.

Loads must be safety landed and stable before unhooking. Chocks, blocks or other means must be used to prevent movement of materials while hooking or unhooking.

Stay clear of slings when they are being pulled out from under a load. The hook may catch and suddenly fly free.

Do not give signals to the operator unless it is an emergency stop or you are the designated signalman.

Always use a double sling when rigging loads like pipe, rebar, or lumber over 12 feet long.

Never ride the load or headache ball unless in an extreme emergency.

Stay out from under suspended loads. No employees are allowed under suspended loads at any time.

Do not swing a load over someone without warning. No employee shall be allowed under a suspended load

Keep your hands off suspended loads whenever possible. Use a tagline when applicable to control suspended loads and to keep yourself out of the caught in between pinch point areas. Tag lines shall be non-conductive to protect from contact with an energized electrical line. Additional tagline requirements:

- Do wrap the tagline around your arms or body.
- Do not use a tagline that has a loop or knot in it.
- Do not us a tagline if it creates a greater hazard.

7. Rigging Compliance Checklist

Safety is a continuing concept, requiring daily attention to every detail. It takes only an instant to become “unsafe”, and this very instant may cause an incident or injury. The rigging checklist is an important tool in your daily safety efforts and establishes the minimum requirements to be followed prior to making a lift. All work must be performed in a safe manner. Your safety and the safety of others depend on YOU.

Lifting equipment general condition: Inspect all equipment for proper working condition. Check for damaged cables, safety devices, fluid levels, and operator qualifications.

Verify load weight: Know the weight of the load to be lifted. Check vendor drawings or equipment tags for shipping weights. If necessary, estimate weights from material weight charts.

Check equipment capacity: Calculate motorized equipment capacity from approved load charts. Check equipment tags for rated capacity.

All outriggers down and locked: Be sure all equipment outriggers are down and locked on mobile cranes. Check for proper outrigger matting when required.

All safety latches in place on the hooks to eliminate the throat hook from opening: Inspect safety latches for proper operation.

Shackle capacity: Verify shackle size, which is imprinted on the side of the shackle. Use your shackle chart to determine adequate safe load capacity.

Rig load for proper balance: Calculate load center of gravity. When in doubt, use multiple slings rigging.

Position load line over load center: Load line position should be such that load cannot swing into personnel or equipment.

Secure the load from swinging free: When lifting a load free from a previously anchored position, such as cutting out piping that has been in service, removing equipment from foundations, or dismantling structural members, attach a security device such as a come-a-long, chain-fall, or rope.

Tag line installed and manned: Have a tag line installed and adequately manned before attempting to swing or transport any load.

Plan the sequence of the work: Have your lift planned, including the swing path and lay-down area. Review this work sequence with your flagman, operator, and tag line personnel. Make sure all concerned fully understand the sequence of events prior to making the lift.

Be sure to maintain at least a 10- foot clearance from any electric service lines.

8. Signal Communication

Employees performing signal communication shall do so in the manner specified by this Safety Program in an effort to eliminate any potential incidents in this area. This Program provides the minimum procedures for employees performing signal communication and applies to all employees and subcontractors engaged in operations covered by the Safety Program.

The designated signal person shall know and understand the type of signal communication to be used. If hand signals are going to be used, the signal person must know and understand the standard method of the hand signals and must be competent in the application of the hand signals. Signal communication shall be performed by a qualified signal person. ANSI standard hand signals provided.

9. Signal Communication General Requirements

A signal person shall be provided in each of the following situations:

1. The point of operation, meaning the load travel or area near or at the load placement, is not in full view of the operator.
2. When the equipment is traveling, the view in the direction of travel is obstructed.
3. Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.

Types of Signals: Signals to operators shall be by hand, voice, audible, or new signals. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operators (such as direct line of sight, video, radio, etc.) must be appropriate for the sight conditions.

Signals- The hand signal charts shall be posted on either the equipment or conspicuously posted in the vicinity of the hoisting operations.

During operations the operator and signal person shall maintain communication at all time.

If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.

Only one person may give signals to a crane operator at one time.

All directions given to the crane operator by the signal person shall be given from the operator's direction perspective.

Definitions

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. *Dedicated channel* means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).

Power lines means electric transmission and distribution lines.

Qualified person means a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

Qualified rigger is a rigger who meets the criteria for a qualified person.

Rated capacity means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.

Running wire rope means a wire rope that moves over sheaves or drums. Sling means an assembly that connects the load to the material handling equipment.

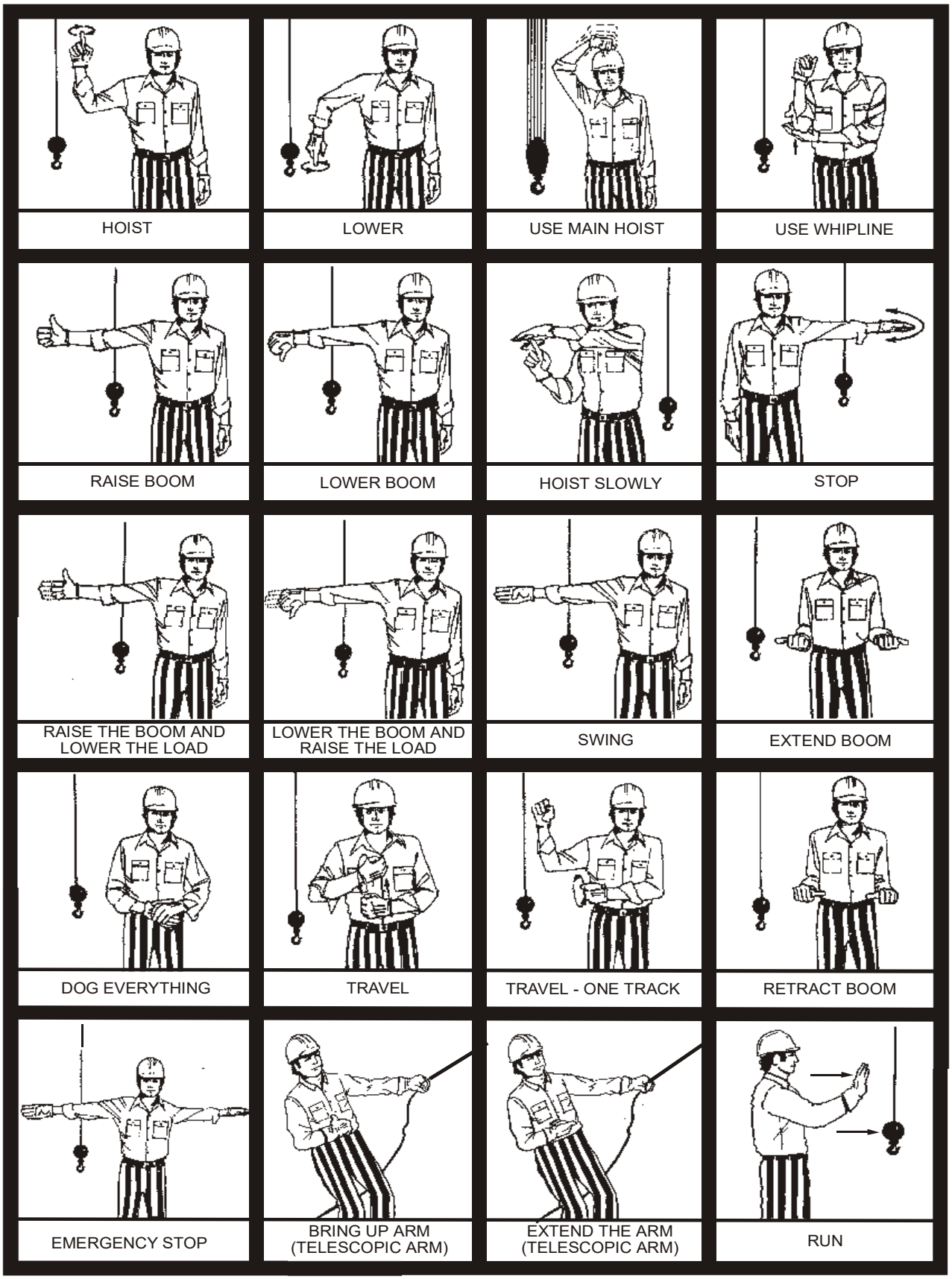
Tagline means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.

Two blocking means a condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component. This binds the system and continued application of power can cause failure of the hoist rope or other component.

Wire rope means a flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.

Forms

#	Form Name	Page #
1	**Hand Signal Chart**	**11**


HOIST
LOWER
USE MAIN HOIST
USE WHIPLINE
RAISE BOOM
LOWER BOOM
HOIST SLOWLY
STOP
RAISE THE BOOM AND LOWER THE LOAD
LOWER THE BOOM AND RAISE THE LOAD
SWING
EXTEND BOOM
DOG EVERYTHING
TRAVEL
TRAVEL - ONE TRACK
RETRACT BOOM
EMERGENCY STOP
BRING UP ARM (TELESCOPIC ARM)
EXTEND THE ARM (TELESCOPIC ARM)
RUN

FLEX-ERECT

SECTION 22

SUBJECT: Hazard Communication Program

REGULATORY STANDARD: OSHA - 29 CFR 1910.1200

GENERAL: Flex-Erect attempts to ensure that the hazards of all chemicals used at our job sites or facilities are evaluated and that information concerning their hazards is transmitted to all employees. This program is intended to address the issues of evaluating the potential hazards of chemicals, communicating information concerning these hazards, and establishing appropriate protective measures for employees. A written Hazard Communication Program shall be developed, implemented & maintained at each workplace.

RESPONSIBILITY: Effective implementation of this program requires support from all levels of management within this company. The Safety Manager is the program coordinator, acting as the representative of the company owners, who have the ultimate responsibility for all facets of this program. The Safety Manager has full authority to make necessary decisions to ensure success of the program. Supervisors are required to be familiar with the contents of this program, will ensure the program is followed by their subordinates on a daily basis, and will maintain a copy of the program and SDS's available for their subordinates. Subcontractors are responsible for maintaining a written Hazard Communication program for their employees. Subcontractors will submit, to the Safety Manager, copies of all SDS are used at any Flex-Erect jobsite.

Section	Contents of the Hazard Communication Program	Page
1	Written Program	3
2	Training Requirements	3
3	Labeling Requirements	4
4	Safety Data Sheets and Hazardous Materials Inventory List	4
5	Non-Company Employee Program	5
6	Multi-Employer Worksites	5
7	Trade Secrets	5
8	Non Routine Tasks	5
9	Chemical Storage	6

FLEX-ERECT

Hazardous Communication & Safety Data Sheet Program



This safety program was developed in cooperation with:

COMPLIANCE SAFETY CONSULTING

www.csc-safety.com

HAZARD COMMUNICATION PROGRAM

1. Written Program.

This program will be maintained in accordance with 29 CFR 1910.1200 and updated periodically or as required. This written program will be communicated to all personnel that are affected by it. Flex-Erect will make the written hazard communication program available to all employees, during each work shift.

2. Training Requirements.

Flex-Erect will provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, periodically, and whenever a new chemical is introduced into their work area that could present a potential hazard.

2.1 Information. Flex-Erect employees will be informed of:

2.1.1 The OSHA standard 29 CFR 1910.1200.

2.1.2 Any operations in their work area where hazardous chemicals are present.

2.1.3 The location and availability of the written hazard communication program, including a list(s) of hazardous chemicals used in their work area, and the associated Safety Data Sheet (SDS).

2.2 Training. Employee hazard communication training at Flex-Erect will be conducted periodically by the Safety Manager or an approved training instructor. Newly hired personnel will be briefed on the general requirements of the OSHA hazard communication standard, as well as duty specific hazards before they begin any duties at a new work area. This training will include at least the following:

2.2.1 Hazard Communication Standard/ Globally Harmonized System Changes. The three major areas of change are in hazard classification, labels, and safety data sheets.

- **Hazard Classification:** The definitions of hazard have been changed to provide specific criteria for classification of health and physical hazards, as well as classification of mixtures. These specific criteria will help to ensure that evaluations of hazardous effects are consistent across manufacturers, and that labels and safety data sheets are more accurate as a result.
- **Labels:** Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.
- **Safety Data Sheets:** Will now have a specified 16-section format.

2.2.2 Methods that may be used to detect the presence or release of a hazardous chemical in the work area. This will include; any monitoring conducted by Flex-

Erect continuous monitoring devices, visual appearance, or odor of hazardous chemicals when being released, etc. Safety Data Sheets (SDS) will be used to augment this requirement where ever possible.

2.2.3 The physical and health hazards of the chemicals present in the work area (e.g., flash point, reactivity, toxicity).

2.2.4 The measures employees can take to protect themselves from these hazards. Specific procedures Flex-Erect has implemented to protect employees from exposure to hazardous chemicals, to include; appropriate work practices, Programs, emergency procedures, and personal protective equipment.

2.2.5 An explanation of the labeling system used at Flex-Erect the Safety Data Sheet, and how employees can obtain and use the appropriate hazard information.

2.2.6 The chemical (formal) and common name(s) of products used, and all ingredients which have been determined to be health hazards.

2.2.7 The primary route(s) of entry; inhalation, absorption, ingestion, injection, and target organs.

2.2.8 The OSHA permissible exposure limit, ACGIH Threshold Limit Value, including any other exposure limit used or recommended by the chemical manufacturer.

2.2.9 Whether the hazardous chemical has been found to be a potential carcinogen by the International Agency for Research on Cancer (IARC).

2.2.10 Any generally applicable precautions for safe handling and use, which are known including appropriate hygienic practices, protective measures during repair, maintenance of contaminated equipment and procedures for clean up of spills and leaks.

2.2.11 Emergency and first aid procedures.

2.2.12 Globally Harmonized System

2.3 Documentation. All training will be documented using an attendance roster. Certificates of completion will be issued to attendees by the Safety Manager and a copy of the completion certificate filed.

3. Labeling Requirements.

Flex-Erect requires the labeling of containers of chemicals used at Flex-Erect as well as of containers of chemicals and hazardous materials being shipped off site. The following procedures apply:

3.1 Unmarked Containers. No unmarked container containing chemicals may be used in conjunction with any duties or operations by employees of Flex-Erect Container Labeling. Flex-Erect will maintain and provide container labels to any employee requesting. Employees will ensure that labels on incoming containers of hazardous chemicals are not removed or defaced. Containers containing hazardous chemicals will be properly disposed of and the labels defaced after use. Once they are emptied, chemical containers can never be used in the place of any other container (for example, trash receptacles).

3.2 All container labels will list at least the chemical identity, appropriate hazard warnings, and the name and address of the manufacturer, importer or other responsible party.

4. Safety Data Sheets (SDS) and Hazardous Materials Inventory List.

The Purchasing or Safety Manager is responsible for obtaining SDS's for every chemical used by Flex-Erect. The Safety Manager will maintain a master copy in the Management Office and also establish an SDS inventory list for each work location. The SDS book shall remain readily accessible to all employees. In addition, the Safety Manager will review the SDS's for all chemicals used to determine if additional precautions or special personal protective equipment will be required in order to ensure employee safety.

4.1 Supervisors will be responsible to maintain readily accessible copies of the SDS's at the job sites and to ensure that all employees are aware of the location.

4.2 SDS requests. A request letter will be forwarded to any vender who does not provide an SDS with a product received by this company.

4.3 Hazardous Substances Inventory. The Company maintains an inventory of all known hazardous substances in use on the job site. A chemical inventory list will be established for each work location and will be available to all personnel.

4.4 Hazardous substances brought onto the job site by the company will be included on the hazardous chemical inventory list in the SDS Log Book or in a separate SDS log for specific job information.

5. Non-Company Employees Program.

Visitors, Contract Employees, and Contractor Personnel. The Safety Manager and/or Supervisor will advise visitors, contract employees, and contractor personnel of any chemical hazards originating with Flex-Erect that may be encountered in the normal course of their work on the premises, the labeling system in use, the protective measures to be taken, the safe handling procedures to be used, and availability of SDS's. Any contractor bringing chemicals on-site must provide Flex-Erect with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals.

6. Multi- Employer Worksites.

Worksites with multi-contractors (employers) shall establish a procedure to identify and communicate the chemicals that are being brought to the work site. Any contractor bringing chemicals on-site must provide Flex-Erect with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals. Each contractor shall establish an SDS book that will include an inventory list of the chemicals brought to the site and the Safety Data Sheets. The SDS book will be accessible to all contractors working on the site.

7. Trade Secrets.

To protect trade secrets, the chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name, and other specific identification of a hazardous chemical, from the Safety Data Sheet. To ensure the safety of our employees, Flex-Erect will obtain any information not shown on a SDS from a supplier, when such information is needed to determine the hazardous constituents of chemicals used within our facility or by our employees. FLEX-ERECT L.L.C. employees will not use a specific chemical, if they cannot determine from the SDS (or other approved source) proper protective measures to be used.

8. Non-Routine Tasks.

No employee will be allowed to perform tasks that they are not fully trained to accomplish. Non-routine tasks will be evaluated prior to accomplishment of work and the related hazard assessed to develop protective measures.

9. Chemical Storage.

Flex-Erect will ensure that proper storage locations are provided to employees using chemicals. Flammable chemicals will be stored in approved flammable liquids cabinets designed in accordance with 29 CFR 1910.106. Toxic and corrosive chemicals will be stored apart from flammable chemicals and will be further segregated according to acidity and/or alkalinity. All chemical storage location will be approved by the Safety Manager before use.

HCS Pictograms

HCS Pictograms and Hazards

Health Hazard	Flame	Exclamation Mark
		
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non Mandatory)
Gas Cylinder	**Corrosion**	**Exploding Bomb**
		
• Gases under Pressure	• Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	• Explosives • Self-Reactives • Organic Peroxides
Flame over Circle	**Environment (Non Mandatory)**	**Skull and Crossbones**
		
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)

CHEMICAL INVENTORY INDEX

COMMON NAME	MANUFACTURER, PRODUCT NAME	SDS INDEX #
HY 70	Hilti, Inc., Hilti HIT-HY 70	
RE 500	Hilti, Inc., Hilti HIT-RE 500 V3	
HY 200	Hilti, Inc., Hilti HIT-HY 200-R	
HY 200 A	Hilti, Inc., Hilti HIT-HY 200-A	
Oxygen	Praxair, Inc., Compressed Oxygen	P-4638
Propane	Praxair, Inc., Propane	P-4646
Acetylene	Praxair, Inc., Acetylene	P-6201
Filler Metal	Hobart Filler Metals, Filler Metal	415884
Gasoline	HESS Corporation, Gasoline	9950
Diesel	HESS Corporation, Diesel	9909
Painters Tape	3M, Scotch-Blue Painters Tape	
Contact Adhesive	DAP Weldwood Original Contact Cement	000305030001
Super Glue	DAP Super Glue	00030802001
Spray Adhesive	3M High Strength 90 Spray Adhesive	
Multipurpose Adhesive	3M Super 77 Multipurpose Adhesive (Aerosol)	
Contact Cement	3M Neoprene High Performance Contact Adhesive 1357	
Power Grab	Loctite Power Grab Ultimate Construction Adhesive	
Power Grab Express	Loctite Power Grab All Purpose Express	
Subfloor Adhesive	Loctite PL400 Subfloor Adhesive	
Gorilla Super Glue	Gorilla Super Glue	

Liquid Nails Subfloor Adhesive	**PPG Liquid Nails Subfloor Adhesive**	**00384054**
Liquid Nails Fuze It	**PPG Liquid Nails Fuse It**	**00378931**
Liquid Nails Extreme Heavy Duty	**PPG Liquid Nails Extreme Heavy Duty Interior & Exterior Construction Adhesive**	**00414607**
Mineral Spirits	**Whitaker Oil Company, Mineral Spirits Regular**	
Lacquer Thinner	**Klean Strip Lacquer Thinner**	
Denatured Alcohol	**Klean Strip Denatured Alcohol**	
Acetone	**ThermoFisher Scientific Acetone**	
MEK	**Methyl ethyl ketone (MEK)**	**606-002-003-3**
Double Stick Tape	**3M Scotch Double Sided Tape 9086**	
Tap Magic Cutting Fluid	**Tap Magic Formula 1 Aqueous**	
ZRC Worldwide	**ZRC and Galvillite Cold Galvanizing Compounds – Aerosol**	**10000, 20010**
US Silica	**Silica Sand, Ground Silica and Fine Ground Silica**	
AC 100+Gold - Compound A	**DeWalt Adhesive Mortar**	

FLEX-ERECT

SECTION 23

SUBJECT: Safety Data Sheets



Material Safety Data Sheet

Copyright, 2009, 3M Company. All rights reserved. Copying and/or downloading of this information for the purpose of properly utilizing 3M products is allowed provided that: (1) the information is copied in full with no changes unless prior written agreement is obtained from 3M, and (2) neither the copy nor the original is resold or otherwise distributed with the intention of earning a profit thereon.

This material safety data sheet (MSDS) is provided as a courtesy in response to a customer request. This product is not regulated under, and a MSDS is not required for this product by the OSHA Hazard Communication Standard (29 CFR 1910.1200) because, when used as recommended or under ordinary conditions, it should not present a health and safety hazard. However, use or processing of the product not in accordance with the product's recommendations or not under ordinary conditions may affect the performance of the product and may present potential health and safety hazards.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M brand Scotch-Blue (TM) Painter's Tape 2090
MANUFACTURER: 3M
DIVISION: Construction and Home Improvement Markets

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 04/06/09
Supercedes Date: 09/14/07

Document Group: 20-2435-4

Product Use:
Intended Use: Masking Tape

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
POLYACRYLATE	Trade Secret	50 - 55
PAPER	***** Missing Data *****	45 - 50

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Roll of Tape
Odor, Color, Grade: Roll of tape
General Physical Form: Solid

Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
Mechanical eye irritation: Signs/symptoms may include pain, redness, tearing and corneal abrasion.

Skin Contact:
Mechanical Skin irritation: Signs/symptoms may include abrasion, redness, pain, and itching.

Inhalation:
No health effects are expected.

Ingestion:
No health effects are expected.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

Skin Contact: Wash affected area with soap and water. If signs/symptoms develop, get medical attention.

Inhalation: No need for first aid is anticipated.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*
OSHA Flammability Classification:	Not Applicable

5.2 EXTINGUISHING MEDIA

Material will not burn. Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable. No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Not applicable.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

7.2 STORAGE
Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Not applicable.

8.2.2 Skin Protection
Not applicable. Avoid skin contact. Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

8.2.3 Respiratory Protection
Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection.

8.2.4 Prevention of Swallowing
Not applicable.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Roll of Tape
Odor, Color, Grade:	Roll of tape
General Physical Form:	Solid
Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*
Boiling point	*Not Applicable*
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Solubility in Water	Nil
Evaporation rate	*Not Applicable*
Volatile Organic Compounds	*Not Applicable*
Percent volatile	*Not Applicable*
VOC Less H2O & Exempt Solvents	*Not Applicable*
Viscosity	*Not Applicable*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: None known

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not applicable.

CHEMICAL FATE INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of waste product in a sanitary landfill. As a disposal alternative, incinerate in an industrial or commercial facility.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 1 **Flammability:** 0 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 0 **Flammability:** 0 **Reactivity:** 0 **Protection:** A

Hazardous Material Identification System (HMIS(r)) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS(r) ratings are to be used with a fully implemented HMIS(r) program. HMIS(r) is a registered mark of the National Paint and Coatings Association (NPCA).

Reason for Reissue: The MSDS has been revised because 3M has adopted the 16-section ANSI/ISO format. The potential hazards of the product have not changed. We encourage you to reread the MSDS and review the information.

Revision Changes:
Section 1: Division name was modified.
Copyright was modified.
Section 2: Ingredient table was added.
Section 8: Exposure guidelines information - none - was added.

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Safety Data Sheet

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Document Group:	16-4935-9	**Version Number:**	11.00
Issue Date:	04/28/17	**Supercedes Date:**	09/23/16

SECTION 1: Identification

1.1. Product identifier
3M™ Hi-Strength Spray Adhesive 90 (aerosol)

Product Identification Numbers
62-4942-4730-7, 62-4942-4920-4, 62-4942-4921-2, 62-4942-4922-0, 62-4942-4925-3, 62-4942-4927-9, 62-4942-4930-3, 62-4942-4935-2, 62-4942-4950-1, 62-4942-4955-0, 62-4942-4970-9, 62-4942-4975-8, CS-0406-7111-0

1.2. Recommended use and restrictions on use

Recommended use
Aerosol adhesive. Recommended for industrial and professional use., hi-strength aerosol adhesive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Flammable Aerosol: Category 1.
Gas Under Pressure: Liquefied gas.
Serious Eye Damage/Irritation: Category 2B.
Simple Asphyxiant.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (single exposure): Category 3.

2.2. Label elements
Signal word
Danger

Symbols

Flame | Gas cylinder | Exclamation mark | Health Hazard |

Pictograms



Hazard Statements
Extremely flammable aerosol.
Contains gas under pressure; may explode if heated.

Causes eye irritation.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May displace oxygen and cause rapid suffocation.

Causes damage to organs:
cardiovascular system |

Precautionary Statements
General:
Keep out of reach of children.

Prevention:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF exposed: Call a POISON CENTER or doctor/physician.
Specific treatment (see Notes to Physician on this label).

Storage:
Protect from sunlight. Do not expose to temperatures exceeding 50C/122F.
Keep container tightly closed.
Store locked up in a well-ventilated place.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Notes to Physician:
Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

2.3. Hazards not otherwise classified

Supplemental Information:
Intentional misuse by deliberately concentrating and inhaling contents can be harmful or fatal.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Dimethyl ether	115-10-6	35 - 45 Trade Secret *
Methyl acetate	79-20-9	25 - 35 Trade Secret *
Nonvolatile components (N.J.T.S. Reg. No. 0449960-6448P)	Trade Secret*	10 - 20 Trade Secret *
Cyclohexane	110-82-7	7 - 13 Trade Secret *
1,1-Difluoroethane	75-37-6	1 - 5 Trade Secret *
Pentane	109-66-0	1 - 5 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. Get medical attention.

Skin Contact:
Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:
Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Irritant Vapors or Gases	During Combustion

5.3. Special protective actions for fire-fighters
No special protective actions for fire-fighters are anticipated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Ventilate the area with fresh air. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
If possible, seal leaking container. Place leaking containers in a well-ventilated area, preferably an operating exhaust hood, or if necessary outdoors on an impermeable surface until appropriate packaging for the leaking container or its contents is available. Close cylinder. Collect as much of the spilled material as possible using non-sparking tools. Place in a metal container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep out of reach of children. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Do not pierce or burn, even after use. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.)

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50C/122F. Store away from heat. Store away from acids. Store away from oxidizing agents.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Pentane	109-66-0	OSHA	TWA:2950 mg/m3(1000 ppm)	
Pentane	109-66-0	ACGIH	TWA:1000 ppm	
Cyclohexane	110-82-7	OSHA	TWA:1050 mg/m3(300 ppm)	
Cyclohexane	110-82-7	ACGIH	TWA:100 ppm	
Dimethyl ether	115-10-6	AIHA	TWA:1880 mg/m3(1000 ppm)	
1,1-Difluoroethane	75-37-6	AIHA	TWA:2700 mg/m3(1000 ppm)	
Methyl acetate	79-20-9	ACGIH	TWA:200 ppm;STEL:250 ppm	
Methyl acetate	79-20-9	OSHA	TWA:610 mg/m3(200 ppm)	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines

OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Do not remain in area where available oxygen may be reduced. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended: Butyl Rubber
Nitrile Rubber

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece supplied-air respirator
Organic vapor respirators may have short service life.

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Gas
Specific Physical Form:	Aerosol
Odor, Color, Grade:	clear, sweet fruity odor
Odor threshold	*No Data Available*
pH	*No Data Available*
Melting point	*Not Applicable*
Boiling Point	*Not Applicable*
Flash Point	-42.00 °F [*Test Method:*Tagliabue Closed Cup]
Evaporation rate	1.9 [*Ref Std:*ETHER=1]
Flammability (solid, gas)	Flammable Aerosol: Category 1.
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Vapor Density	2.97 [*Ref Std:*AIR=1]
Density	0.726 g/ml

Specific Gravity	0.726 [*Ref Std:*WATER=1]
Solubility in Water	Nil
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*Not Applicable*
Viscosity	*Not Applicable*
Hazardous Air Pollutants	<=0 % weight [*Test Method:*Calculated]
Molecular weight	*No Data Available*
VOC Less H2O & Exempt Solvents	<=55 % [*Test Method:*calculated per CARB title 2]

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
Heat

10.5. Incompatible materials
Strong oxidizing agents

10.6. Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
Intentional concentration and inhalation may be harmful or fatal.

Simple Asphyxiation: Signs/symptoms may include increased heart rate, rapid respirations, drowsiness, headache,

incoordination, altered judgement, nausea, vomiting, lethargy, seizures, coma, and may be fatal.

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:
Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Eye Contact:
Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Single exposure, above recommended guidelines, may cause:
Cardiac Sensitization: Signs/symptoms may include irregular heartbeat (arrhythmia), faintness, chest pain, and may be fatal.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Dimethyl ether	Inhalation-Gas (4 hours)	Rat	LC50 164,000 ppm
Methyl acetate	Dermal	Rat	LD50 > 2,000 mg/kg
Methyl acetate	Inhalation-Vapor (4 hours)	Rat	LC50 > 49 mg/l
Methyl acetate	Ingestion	Rat	LD50 > 5,000 mg/kg
Cyclohexane	Dermal	Rat	LD50 > 2,000 mg/kg
Cyclohexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 32.9 mg/l
Cyclohexane	Ingestion	Rat	LD50 6,200 mg/kg
Nonvolatile components (N.J.T.S. Reg. No. 0449960-6448P)	Dermal		LD50 estimated to be > 5,000 mg/kg
Nonvolatile components (N.J.T.S. Reg. No. 0449960-6448P)	Ingestion	Rat	LD50 > 34,000 mg/kg
Pentane	Dermal	Rabbit	LD50 3,000 mg/kg
Pentane	Inhalation-Vapor (4 hours)	Rat	LC50 > 18 mg/l
Pentane	Ingestion	Rat	LD50 > 2,000 mg/kg
1,1-Difluoroethane	Inhalation-	Rat	LC50 > 437,000 ppm

	Gas (4 hours)		
1,1-Difluoroethane	Ingestion	Rat	LD50 > 1,500 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Methyl acetate	Rabbit	No significant irritation
Cyclohexane	Rabbit	Mild irritant
Pentane	Rabbit	Minimal irritation

Serious Eye Damage/Irritation

Name	Species	Value
Methyl acetate	Rabbit	Moderate irritant
Cyclohexane	Rabbit	Mild irritant
Pentane	Rabbit	Mild irritant

Skin Sensitization

Name	Species	Value
Methyl acetate	Human	Not classified
Pentane	Guinea pig	Not classified

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
Dimethyl ether	In Vitro	Not mutagenic
Dimethyl ether	In vivo	Not mutagenic
Methyl acetate	In Vitro	Not mutagenic
Methyl acetate	In vivo	Not mutagenic
Cyclohexane	In Vitro	Not mutagenic
Cyclohexane	In vivo	Some positive data exist, but the data are not sufficient for classification
Pentane	In vivo	Not mutagenic
Pentane	In Vitro	Some positive data exist, but the data are not sufficient for classification
1,1-Difluoroethane	In Vitro	Some positive data exist, but the data are not sufficient for classification
1,1-Difluoroethane	In vivo	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
Dimethyl ether	Inhalation	Rat	Not carcinogenic
1,1-Difluoroethane	Inhalation	Rat	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Dimethyl ether	Inhalation	Not classified for development	Rat	NOAEL 40,000 ppm	during organogenesis
Cyclohexane	Inhalation	Not classified for female reproduction	Rat	NOAEL 24	2 generation

				mg/l	
Cyclohexane	Inhalation	Not classified for male reproduction	Rat	NOAEL 24 mg/l	2 generation
Cyclohexane	Inhalation	Not classified for development	Rat	NOAEL 6.9 mg/l	2 generation
Pentane	Ingestion	Not classified for development	Rat	NOAEL 1,000 mg/kg/day	during organogenesis
Pentane	Inhalation	Not classified for development	Rat	NOAEL 30 mg/l	during organogenesis
1,1-Difluoroethane	Inhalation	Not classified for development	Rat	NOAEL 50,000 ppm	during organogenesis

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Dimethyl ether	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Rat	LOAEL 10,000 ppm	30 minutes
Dimethyl ether	Inhalation	cardiac sensitization	Some positive data exist, but the data are not sufficient for classification	Dog	NOAEL 100,000 ppm	5 minutes
Methyl acetate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Methyl acetate	Inhalation	respiratory irritation	May cause respiratory irritation	Human and animal	NOAEL Not available	
Methyl acetate	Inhalation	blindness	Not classified		NOAEL Not available	
Methyl acetate	Ingestion	central nervous system depression	May cause drowsiness or dizziness		NOAEL Not available	
Cyclohexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Cyclohexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human and animal	NOAEL Not available	
Cyclohexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Pentane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Multiple animal species	NOAEL Not available	not available
Pentane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Not available	NOAEL Not available	not available
Pentane	Inhalation	cardiac sensitization	Not classified	Dog	NOAEL Not available	not available
Pentane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	not available
1,1-Difluoroethane	Inhalation	cardiac sensitization	Causes damage to organs	Human and animal	NOAEL Not available	poisoning and/or abuse
1,1-Difluoroethane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL 100,000 ppm	
1,1-Difluoroethane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Not available	NOAEL Not available	not available

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Dimethyl ether	Inhalation	hematopoietic system	Not classified	Rat	NOAEL 25,000 ppm	2 years
Dimethyl ether	Inhalation	liver	Not classified	Rat	NOAEL 20,000 ppm	30 weeks
Methyl acetate	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1.1 mg/l	28 days
Methyl acetate	Inhalation	endocrine system | hematopoietic system | liver | immune system | kidney and/or bladder	Not classified	Rat	NOAEL 6.1 mg/l	28 days
Cyclohexane	Inhalation	liver	Not classified	Rat	NOAEL 24 mg/l	90 days
Cyclohexane	Inhalation	auditory system	Not classified	Rat	NOAEL 1.7 mg/l	90 days
Cyclohexane	Inhalation	kidney and/or bladder	Not classified	Rabbit	NOAEL 2.7 mg/l	10 weeks
Cyclohexane	Inhalation	hematopoietic system	Not classified	Mouse	NOAEL 24 mg/l	14 weeks
Cyclohexane	Inhalation	peripheral nervous system	Not classified	Rat	NOAEL 8.6 mg/l	30 weeks
Pentane	Inhalation	peripheral nervous system	Not classified	Human	NOAEL Not available	occupational exposure
Pentane	Inhalation	heart | skin | endocrine system | bone, teeth, nails, and/or hair | hematopoietic system | liver | immune system | muscles | nervous system | eyes | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 20 mg/l	13 weeks
Pentane	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 2,000 mg/kg/day	28 days
1,1-Difluoroethane	Inhalation	hematopoietic system | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 25,000 ppm	2 years

Aspiration Hazard

Name	Value
Cyclohexane	Aspiration hazard
Pentane	Aspiration hazard

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Facility must be capable of handling aerosol cans. The facility should be equipped to handle gaseous waste. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable)

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - Yes Pressure Hazard - Yes Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

EPCRA 311/312 Hazard Classifications (effective January 1, 2018):

Physical Hazards
Flammable (gases, aerosols, liquids, or solids)
Gas under pressure

Health Hazards
Serious eye damage or eye irritation
Simple Asphyxiant
Specific target organ toxicity (single or repeated exposure)

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Cyclohexane	110-82-7	Trade Secret 7 - 13

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations
Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 2 **Flammability:** 4 **Instability:** 0 **Special Hazards:** None
Aerosol Storage Code: 3

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

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SECTION 1: Identification

1.1. Product identifier
3M™ Neoprene High Performance Contact Adhesive 1357

Product Identification Numbers

ID Number	UPC	ID Number	UPC
62-1357-2630-5	00-21200-85812-3	62-1357-2631-3	00-21200-19887-8
62-1357-5530-4	00-21200-19890-8	62-1357-5535-3	
62-1357-6530-3	00-21200-19892-2	62-1357-7530-2	00-21200-19894-6
62-1357-8540-0	00-21200-19897-7	62-1357-9530-0	00-21200-19898-4
62-1357-9531-8	00-21200-19899-1		

1.2. Recommended use and restrictions on use

Recommended use
Adhesive, Industrial use

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Flammable Liquid: Category 2.
Serious Eye Damage/Irritation: Category 2A.
Skin Corrosion/Irritation: Category 2.
Reproductive Toxicity: Category 1B.
Specific Target Organ Toxicity (single exposure): Category 3.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements

Signal word
Danger

Symbols
Flame | Exclamation mark | Health Hazard |

Pictograms



Hazard Statements
Highly flammable liquid and vapor.

Causes serious eye irritation.
Causes skin irritation.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.

Causes damage to organs through prolonged or repeated exposure:
nervous system |
sensory organs |

Precautionary Statements

Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Keep container tightly closed.
Use explosion-proof electrical/ventilating/lighting equipment.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves and eye/face protection.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
If skin irritation occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
IF exposed or concerned: Get medical advice/attention.
In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

Storage:

Keep cool.
Keep container tightly closed.
Store locked up in a well-ventilated place.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Magnesium Resinate	68037-42-3	5 - 10 Trade Secret *
Petroleum Distillate	64741-84-0	20 - 50 Trade Secret *
n-Hexane	110-54-3	5 - 20 Trade Secret *
Acetone	67-64-1	10 - 30 Trade Secret *
Polychloroprene	9010-98-4	7 - 13 Trade Secret *
Methyl Ethyl Ketone	78-93-3	7 - 13 Trade Secret *
Toluene	108-88-3	< 10 Trade Secret *
Rosin	8050-09-7	< 1 Trade Secret *
Zinc Oxide	1314-13-2	0.1 - 1 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:
Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.

Eye Contact:
Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

5.2. Special hazards arising from the substance or mixture

Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Aldehydes	During Combustion
Hydrocarbons	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Chloride	During Combustion

5.3. Special protective actions for fire-fighters
Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Contain spill. Cover spill area with a fire-extinguishing foam. An appropriate aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible using non-sparking tools. Place in a metal container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
For industrial or professional use only. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Wear low static or properly grounded shoes. Use personal protective equipment (gloves, respirators, etc.) as required. To minimize the risk of ignition, determine applicable electrical classifications for the process using this product and select specific local exhaust ventilation equipment to avoid flammable vapor accumulation. Ground/bond container and receiving equipment if there is potential for static electricity accumulation during transfer.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store away from heat. Store away from

acids. Store away from oxidizing agents.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Toluene	108-88-3	ACGIH	TWA:20 ppm	A4: Not class. as human carcin
Toluene	108-88-3	OSHA	TWA:200 ppm;CEIL:300 ppm	
n-Hexane	110-54-3	ACGIH	TWA:50 ppm	SKIN
n-Hexane	110-54-3	OSHA	TWA:1800 mg/m3(500 ppm)	
Zinc Oxide	1314-13-2	ACGIH	TWA(respirable fraction):2 mg/m3;STEL(respirable fraction):10 mg/m3	
Zinc Oxide	1314-13-2	OSHA	TWA(as fume):5 mg/m3;TWA(as total dust):15 mg/m3;TWA(respirable fraction):5 mg/m3	
Acetone	67-64-1	ACGIH	TWA:250 ppm;STEL:500 ppm	A4: Not class. as human carcin
Acetone	67-64-1	OSHA	TWA:2400 mg/m3(1000 ppm)	
Methyl Ethyl Ketone	78-93-3	ACGIH	TWA:200 ppm;STEL:300 ppm	
Methyl Ethyl Ketone	78-93-3	OSHA	TWA:590 mg/m3(200 ppm)	
Rosin	8050-09-7	ACGIH	Limit value not established:	Dermal/Respiratory Sensitizer, Cntrl all exposr-low as possib

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment. Use explosion-proof ventilation equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the

substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended: Polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid
Odor, Color, Grade:	Grey/green, strong petroleum odor.
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Boiling Point	>=56 °C [*Details:*Acetone]
Flash Point	-7 °F [*Test Method:*Closed Cup] [*Details:*n-Hexane]
Evaporation rate	>=2 [*Ref Std:*WATER=1]
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	1.0 % volume
Flammable Limits(UEL)	12.8 % volume
Vapor Pressure	<=185 mmHg [@ 68 °F]
Vapor Density	2.0 [*Ref Std:*AIR=1]
Density	0.815 g/ml
Specific Gravity	0.815 [*Ref Std:*WATER=1]
Solubility in Water	Slight (less than 10%)
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity	200 - 450 centipoise [@ 27 °C]
Hazardous Air Pollutants	<=13.2 % weight [*Test Method:*Calculated]
Molecular weight	*No Data Available*
VOC Less H2O & Exempt Solvents	<=580 g/l [*Test Method:*calculated SCAQMD rule 443.1]
Solids Content	12 - 25 %

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
Heat
Sparks and/or flames

10.5. Incompatible materials
Strong oxidizing agents

10.6. Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:
Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Prolonged or repeated exposure may cause target organ effects:
Ocular Effects: Signs/symptoms may include blurred or significantly impaired vision.

Auditory Effects: Signs/symptoms may include hearing impairment, balance dysfunction and ringing in the ears.

Peripheral Neuropathy: Signs/symptoms may include tingling or numbness of the extremities, incoordination, weakness of the hands and feet, tremors and muscle atrophy.

Olfactory Effects: Signs/symptoms may include decreased ability to detect odors and/or complete loss of smell.

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

Reproductive/Developmental Toxicity:
Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Petroleum Distillate	Dermal	Rabbit	LD50 > 2,000 mg/kg
Petroleum Distillate	Inhalation-Vapor (4 hours)	Rat	LC50 259 mg/l
Petroleum Distillate	Ingestion	Rat	LD50 > 5,000 mg/kg
n-Hexane	Dermal	Rabbit	LD50 > 2,000 mg/kg
n-Hexane	Inhalation-Vapor (4 hours)	Rat	LC50 170 mg/l
n-Hexane	Ingestion	Rat	LD50 > 28,700 mg/kg
Acetone	Dermal	Rabbit	LD50 > 15,688 mg/kg
Acetone	Inhalation-Vapor (4 hours)	Rat	LC50 76 mg/l
Acetone	Ingestion	Rat	LD50 5,800 mg/kg
Methyl Ethyl Ketone	Dermal	Rabbit	LD50 > 8,050 mg/kg
Methyl Ethyl Ketone	Inhalation-Vapor (4 hours)	Rat	LC50 34.5 mg/l
Methyl Ethyl Ketone	Ingestion	Rat	LD50 2,737 mg/kg
Polychloroprene	Dermal		LD50 estimated to be > 5,000 mg/kg
Polychloroprene	Ingestion	Rat	LD50 > 20,000 mg/kg
Magnesium Resinate	Dermal		LD50 estimated to be 2,000 - 5,000 mg/kg
Magnesium Resinate	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
Toluene	Dermal	Rat	LD50 12,000 mg/kg
Toluene	Inhalation-Vapor (4 hours)	Rat	LC50 30 mg/l
Toluene	Ingestion	Rat	LD50 5,550 mg/kg
Zinc Oxide	Dermal		LD50 estimated to be > 5,000 mg/kg
Zinc Oxide	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 5.7 mg/l
Zinc Oxide	Ingestion	Rat	LD50 > 5,000 mg/kg
Rosin	Dermal	Rabbit	LD50 > 2,500 mg/kg
Rosin	Ingestion	Rat	LD50 7,600 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Petroleum Distillate	Rabbit	Irritant
n-Hexane	Human and animal	Mild irritant
Acetone	Mouse	Minimal irritation
Methyl Ethyl Ketone	Rabbit	Minimal irritation
Polychloroprene	Human	No significant irritation
Toluene	Rabbit	Irritant
Zinc Oxide	Human and animal	No significant irritation
Rosin	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
Petroleum Distillate	Rabbit	Mild irritant
n-Hexane	Rabbit	Mild irritant
Acetone	Rabbit	Severe irritant
Methyl Ethyl Ketone	Rabbit	Severe irritant
Polychloroprene	Professional judgement	No significant irritation
Toluene	Rabbit	Moderate irritant
Zinc Oxide	Rabbit	Mild irritant
Rosin	Rabbit	Mild irritant

Skin Sensitization

Name	Species	Value
Petroleum Distillate	Guinea pig	Not classified
n-Hexane	Human	Not classified
Toluene	Guinea pig	Not classified
Zinc Oxide	Guinea pig	Not classified
Rosin	Guinea pig	Sensitizing

Respiratory Sensitization

Name	Species	Value
Rosin	Human	Not classified

Germ Cell Mutagenicity

Name	Route	Value
Petroleum Distillate	In Vitro	Not mutagenic
n-Hexane	In Vitro	Not mutagenic
n-Hexane	In vivo	Not mutagenic
Acetone	In vivo	Not mutagenic
Acetone	In Vitro	Some positive data exist, but the data are not sufficient for classification
Methyl Ethyl Ketone	In Vitro	Not mutagenic
Toluene	In Vitro	Not mutagenic
Toluene	In vivo	Not mutagenic
Zinc Oxide	In Vitro	Some positive data exist, but the data are not sufficient for classification

Zinc Oxide	In vivo	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
n-Hexane	Dermal	Mouse	Not carcinogenic
n-Hexane	Inhalation	Mouse	Some positive data exist, but the data are not sufficient for classification
Acetone	Not Specified	Multiple animal species	Not carcinogenic
Methyl Ethyl Ketone	Inhalation	Human	Not carcinogenic
Toluene	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
Toluene	Ingestion	Rat	Some positive data exist, but the data are not sufficient for classification
Toluene	Inhalation	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
n-Hexane	Ingestion	Not classified for development	Mouse	NOAEL 2,200 mg/kg/day	during organogenesis
n-Hexane	Inhalation	Not classified for development	Rat	NOAEL 0.7 mg/l	during gestation
n-Hexane	Ingestion	Toxic to male reproduction	Rat	NOAEL 1,140 mg/kg/day	90 days
n-Hexane	Inhalation	Toxic to male reproduction	Rat	LOAEL 3.52 mg/l	28 days
Acetone	Ingestion	Not classified for male reproduction	Rat	NOAEL 1,700 mg/kg/day	13 weeks
Acetone	Inhalation	Not classified for development	Rat	NOAEL 5.2 mg/l	during organogenesis
Methyl Ethyl Ketone	Inhalation	Not classified for development	Rat	LOAEL 8.8 mg/l	during gestation
Toluene	Inhalation	Not classified for female reproduction	Human	NOAEL Not available	occupational exposure
Toluene	Inhalation	Not classified for male reproduction	Rat	NOAEL 2.3 mg/l	1 generation
Toluene	Ingestion	Toxic to development	Rat	LOAEL 520 mg/kg/day	during gestation
Toluene	Inhalation	Toxic to development	Human	NOAEL Not available	poisoning and/or abuse
Zinc Oxide	Ingestion	Not classified for reproduction and/or development	Multiple animal species	NOAEL 125 mg/kg/day	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Petroleum Distillate	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Petroleum Distillate	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
Petroleum Distillate	Ingestion	central nervous	May cause drowsiness or	Professio	NOAEL Not	

		system depression	dizziness	nal judgeme nt	available	
n-Hexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	not available
n-Hexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Rabbit	NOAEL Not available	8 hours
n-Hexane	Inhalation	respiratory system	Not classified	Rat	NOAEL 24.6 mg/l	8 hours
Acetone	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Acetone	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Acetone	Inhalation	immune system	Not classified	Human	NOAEL 1.19 mg/l	6 hours
Acetone	Inhalation	liver	Not classified	Guinea pig	NOAEL Not available	
Acetone	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	poisoning and/or abuse
Methyl Ethyl Ketone	Inhalation	central nervous system depression	May cause drowsiness or dizziness	official classifica tion	NOAEL Not available	
Methyl Ethyl Ketone	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Methyl Ethyl Ketone	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professio nal judgeme nt	NOAEL Not available	
Methyl Ethyl Ketone	Ingestion	liver	Not classified	Rat	NOAEL Not available	not applicable
Methyl Ethyl Ketone	Ingestion	kidney and/or bladder	Not classified	Rat	LOAEL 1,080 mg/kg	not applicable
Toluene	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Toluene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Toluene	Inhalation	immune system	Not classified	Mouse	NOAEL 0.004 mg/l	3 hours
Toluene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	poisoning and/or abuse

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
n-Hexane	Inhalation	peripheral nervous system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	occupational exposure
n-Hexane	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Mouse	LOAEL 1.76 mg/l	13 weeks
n-Hexane	Inhalation	liver	Not classified	Rat	NOAEL Not available	6 months
n-Hexane	Inhalation	kidney and/or bladder	Not classified	Rat	LOAEL 1.76 mg/l	6 months
n-Hexane	Inhalation	hematopoietic system	Not classified	Mouse	NOAEL 35.2 mg/l	13 weeks
n-Hexane	Inhalation	auditory system | immune system | eyes	Not classified	Human	NOAEL Not available	occupational exposure
n-Hexane	Inhalation	heart | skin | endocrine system	Not classified	Rat	NOAEL 1.76 mg/l	6 months
n-Hexane	Ingestion	peripheral nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,140 mg/kg/day	90 days

n-Hexane	Ingestion	endocrine system | hematopoietic system | liver | immune system | kidney and/or bladder	Not classified	Rat	NOAEL Not available	13 weeks
Acetone	Dermal	eyes	Not classified	Guinea pig	NOAEL Not available	3 weeks
Acetone	Inhalation	hematopoietic system	Not classified	Human	NOAEL 3 mg/l	6 weeks
Acetone	Inhalation	immune system	Not classified	Human	NOAEL 1.19 mg/l	6 days
Acetone	Inhalation	kidney and/or bladder	Not classified	Guinea pig	NOAEL 119 mg/l	not available
Acetone	Inhalation	heart | liver	Not classified	Rat	NOAEL 45 mg/l	8 weeks
Acetone	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 900 mg/kg/day	13 weeks
Acetone	Ingestion	heart	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Acetone	Ingestion	hematopoietic system	Not classified	Rat	NOAEL 200 mg/kg/day	13 weeks
Acetone	Ingestion	liver	Not classified	Mouse	NOAEL 3,896 mg/kg/day	14 days
Acetone	Ingestion	eyes	Not classified	Rat	NOAEL 3,400 mg/kg/day	13 weeks
Acetone	Ingestion	respiratory system	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Acetone	Ingestion	muscles	Not classified	Rat	NOAEL 2,500 mg/kg	13 weeks
Acetone	Ingestion	skin | bone, teeth, nails, and/or hair	Not classified	Mouse	NOAEL 11,298 mg/kg/day	13 weeks
Methyl Ethyl Ketone	Dermal	nervous system	Not classified	Guinea pig	NOAEL Not available	31 weeks
Methyl Ethyl Ketone	Inhalation	liver | kidney and/or bladder | heart | endocrine system | gastrointestinal tract | bone, teeth, nails, and/or hair | hematopoietic system | immune system | muscles	Not classified	Rat	NOAEL 14.7 mg/l	90 days
Methyl Ethyl Ketone	Ingestion	liver	Not classified	Rat	NOAEL Not available	7 days
Methyl Ethyl Ketone	Ingestion	nervous system	Not classified	Rat	NOAEL 173 mg/kg/day	90 days
Toluene	Inhalation	auditory system | nervous system | eyes | olfactory system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	poisoning and/or abuse
Toluene	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 2.3 mg/l	15 months
Toluene	Inhalation	heart | liver | kidney and/or bladder	Not classified	Rat	NOAEL 11.3 mg/l	15 weeks
Toluene	Inhalation	endocrine system	Not classified	Rat	NOAEL 1.1 mg/l	4 weeks
Toluene	Inhalation	immune system	Not classified	Mouse	NOAEL Not available	20 days
Toluene	Inhalation	bone, teeth, nails, and/or hair	Not classified	Mouse	NOAEL 1.1 mg/l	8 weeks

Toluene	Inhalation	hematopoietic system | vascular system	Not classified -	Human	NOAEL Not available	occupational exposure
Toluene	Inhalation	gastrointestinal tract	Not classified	Multiple animal species	NOAEL 11.3 mg/l	15 weeks
Toluene	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 625 mg/kg/day	13 weeks
Toluene	Ingestion	heart	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Toluene	Ingestion	liver | kidney and/or bladder	Not classified	Multiple animal species	NOAEL 2,500 mg/kg/day	13 weeks
Toluene	Ingestion	hematopoietic system	Not classified	Mouse	NOAEL 600 mg/kg/day	14 days
Toluene	Ingestion	endocrine system	Not classified	Mouse	NOAEL 105 mg/kg/day	28 days
Toluene	Ingestion	immune system	Not classified	Mouse	NOAEL 105 mg/kg/day	4 weeks
Zinc Oxide	Ingestion	nervous system	Not classified	Rat	NOAEL 600 mg/kg/day	10 days
Zinc Oxide	Ingestion	endocrine system | hematopoietic system | kidney and/or bladder	Not classified	Other	NOAEL 500 mg/kg/day	6 months

Aspiration Hazard

Name	Value
Petroleum Distillate	Aspiration hazard
n-Hexane	Aspiration hazard
Toluene	Aspiration hazard

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Incinerate in a permitted waste incineration facility. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. As a disposal alternative, utilize an acceptable permitted waste disposal facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable), D035 (Methyl ethyl ketone)

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

EPCRA 311/312 Hazard Classifications:

Physical Hazards
Flammable (gases, aerosols, liquids, or solids)

Health Hazards
Reproductive toxicity
Serious eye damage or eye irritation
Skin Corrosion or Irritation
Specific target organ toxicity (single or repeated exposure)

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Toluene	108-88-3	Trade Secret < 10
n-Hexane	110-54-3	Trade Secret 5 - 20
n-Hexane (Hexane)	110-54-3	5 - 20

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this product are in compliance with the chemical notification requirements of TSCA. All required components of this product are listed on the active portion of the TSCA Inventory.

Contact 3M for more information.

15.4. International Regulations
Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 2 **Flammability:** 3 **Instability:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include

the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Document Group:	10-2789-5	**Version Number:**	43.01
Issue Date:	06/29/18	**Supercedes Date:**	05/21/18

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Safety Data Sheet

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Document Group:	16-3472-4	**Version Number:**	40.00
Issue Date:	05/21/18	**Supercedes Date:**	03/31/17

SECTION 1: Identification

1.1. Product identifier
3M(TM) Super 77(TM) Multipurpose Adhesive (Aerosol)

Product Identification Numbers
62-4977-2924-4, 62-4977-2928-5, 62-4977-4730-3, 62-4977-4922-6, 62-4977-4923-4, 62-4977-4925-9, 62-4977-4929-1, 62-4977-4930-9, 62-4977-4935-8

1.2. Recommended use and restrictions on use

Recommended use
Adhesive aerosol, General Purpose Aerosol adhesive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Flammable Aerosol: Category 1.
Gas Under Pressure: Liquefied gas.
Serious Eye Damage/Irritation: Category 2A.
Reproductive Toxicity: Category 2.
Simple Asphyxiant.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (single exposure): Category 3.

2.2. Label elements
Signal word
Danger

Symbols
Flame | Gas cylinder | Exclamation mark | Health Hazard |

Pictograms



Hazard Statements
Extremely flammable aerosol.
Contains gas under pressure; may explode if heated.

Causes serious eye irritation.
May cause drowsiness or dizziness.
Suspected of damaging fertility or the unborn child.
May displace oxygen and cause rapid suffocation.

Causes damage to organs:
cardiovascular system |

Precautionary Statements
General:
Keep out of reach of children.

Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves and eye/face protection.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see Notes to Physician on this label).

Storage:
Protect from sunlight. Do not expose to temperatures exceeding 50C/122F.
Keep container tightly closed.
Store locked up in a well-ventilated place.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Notes to Physician:

Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Acetone	67-64-1	20 - 30 Trade Secret *
Non-volatile components (N.J.T.S. Registry No. 04499600-6433P)	Trade Secret*	20 - 30 Trade Secret *
Propane	74-98-6	15 - 25 Trade Secret *
Cyclohexane	110-82-7	10 - 20 Trade Secret *
Petroleum distillates	64742-49-0	10 - 20 Trade Secret *
Hexane	110-54-3	< 0.5 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. Get medical attention.

Skin Contact:
Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:
Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Aldehydes	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

5.3. Special protective actions for fire-fighters
Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
If possible, seal leaking container. Place leaking containers in a well-ventilated area, preferably an operating exhaust hood, or if necessary outdoors on an impermeable surface until appropriate packaging for the leaking container or its contents is available. Contain spill. Cover spill area with a fire-extinguishing foam. An appropriate aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible using non-sparking tools. Place in a metal container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep out of reach of children. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Do not pierce or burn, even after use. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Use personal protective equipment (gloves, respirators, etc.) as required.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50C/122F. Store away from heat. Store away from acids. Store away from oxidizing agents.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Hexane	110-54-3	ACGIH	TWA:50 ppm	SKIN
Hexane	110-54-3	OSHA	TWA:1800 mg/m3(500 ppm)	
Cyclohexane	110-82-7	ACGIH	TWA:100 ppm	
Cyclohexane	110-82-7	OSHA	TWA:1050 mg/m3(300 ppm)	

Acetone	67-64-1	ACGIH	TWA:250 ppm;STEL:500 ppm	A4: Not class. as human carcin
Acetone	67-64-1	OSHA	TWA:2400 mg/m3(1000 ppm)	
Propane	74-98-6	ACGIH	Limit value not established:	simple asphyxiant
Propane	74-98-6	OSHA	TWA:1800 mg/m3(1000 ppm)	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Do not remain in area where available oxygen may be reduced. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended: Butyl Rubber
Nitrile Rubber

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece supplied-air respirator

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid aerosol
Specific Physical Form:	Aerosol
Odor, Color, Grade:	Clear, sweet, fruity odor
Odor threshold	*No Data Available*
pH	*No Data Available*
Melting point	*No Data Available*
Boiling Point	*Not Applicable*

Flash Point	-42.00 °F [*Test Method:*Tagliabue Closed Cup]
Evaporation rate	1.9 [*Ref Std:*ETHER=1]
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Vapor Pressure	[*Details:*Compressed gas]*Not Applicable*
Vapor Density	2.97 [*Ref Std:*AIR=1]
Density	0.726 g/ml
Specific Gravity	0.726 [*Ref Std:*WATER=1]
Solubility in Water	Nil
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*Not Applicable*
Viscosity	*Not Applicable*
Hazardous Air Pollutants	<=0.4 % weight [*Test Method:*Calculated]
VOC Less H2O & Exempt Solvents	<=51 % [*Test Method:*calculated per CARB title 2]
Solids Content	>=22.4 %

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
Heat

10.5. Incompatible materials
Strong oxidizing agents

10.6. Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
Intentional concentration and inhalation may be harmful or fatal.

Simple Asphyxiation: Signs/symptoms may include increased heart rate, rapid respirations, drowsiness, headache, incoordination, altered judgement, nausea, vomiting, lethargy, seizures, coma, and may be fatal.

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:
Dermal Defatting: Signs/symptoms may include localized redness, itching, drying and cracking of skin.

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Single exposure, above recommended guidelines, may cause:
Cardiac Sensitization: Signs/symptoms may include irregular heartbeat (arrhythmia), faintness, chest pain, and may be fatal.

Reproductive/Developmental Toxicity:
Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
Propane	Inhalation-Gas (4 hours)	Rat	LC50 > 200,000 ppm
Acetone	Dermal	Rabbit	LD50 > 15,688 mg/kg
Acetone	Inhalation-Vapor (4 hours)	Rat	LC50 76 mg/l

Acetone	Ingestion	Rat	LD50 5,800 mg/kg
Cyclohexane	Dermal	Rat	LD50 > 2,000 mg/kg
Cyclohexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 32.9 mg/l
Cyclohexane	Ingestion	Rat	LD50 6,200 mg/kg
Petroleum distillates	Dermal	Rabbit	LD50 > 3,160 mg/kg
Petroleum distillates	Inhalation-Vapor (4 hours)	Rat	LC50 > 14.7 mg/l
Petroleum distillates	Ingestion	Rat	LD50 > 5,000 mg/kg
Non-volatile components (N.J.T.S. Registry No. 04499600-6433P)	Dermal		LD50 estimated to be > 5,000 mg/kg
Non-volatile components (N.J.T.S. Registry No. 04499600-6433P)	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
Hexane	Dermal	Rabbit	LD50 > 2,000 mg/kg
Hexane	Inhalation-Vapor (4 hours)	Rat	LC50 170 mg/l
Hexane	Ingestion	Rat	LD50 > 28,700 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Propane	Rabbit	Minimal irritation
Acetone	Mouse	Minimal irritation
Cyclohexane	Rabbit	Mild irritant
Petroleum distillates	Rabbit	Irritant
Non-volatile components (N.J.T.S. Registry No. 04499600-6433P)	Professional judgement	Minimal irritation
Hexane	Human and animal	Mild irritant

Serious Eye Damage/Irritation

Name	Species	Value
Propane	Rabbit	Mild irritant
Acetone	Rabbit	Severe irritant
Cyclohexane	Rabbit	Mild irritant
Petroleum distillates	Rabbit	Mild irritant
Hexane	Rabbit	Mild irritant

Skin Sensitization

Name	Species	Value
Petroleum distillates	Guinea pig	Not classified
Hexane	Human	Not classified

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
Propane	In Vitro	Not mutagenic
Acetone	In vivo	Not mutagenic
Acetone	In Vitro	Some positive data exist, but the data are not sufficient for classification
Cyclohexane	In Vitro	Not mutagenic

Cyclohexane	In vivo	Some positive data exist, but the data are not sufficient for classification
Petroleum distillates	In Vitro	Not mutagenic
Hexane	In Vitro	Not mutagenic
Hexane	In vivo	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
Acetone	Not Specified	Multiple animal species	Not carcinogenic
Petroleum distillates	Inhalation	Mouse	Some positive data exist, but the data are not sufficient for classification
Hexane	Dermal	Mouse	Not carcinogenic
Hexane	Inhalation	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
Acetone	Ingestion	Not classified for male reproduction	Rat	NOAEL 1,700 mg/kg/day	13 weeks
Acetone	Inhalation	Not classified for development	Rat	NOAEL 5.2 mg/l	during organogenesis
Cyclohexane	Inhalation	Not classified for female reproduction	Rat	NOAEL 24 mg/l	2 generation
Cyclohexane	Inhalation	Not classified for male reproduction	Rat	NOAEL 24 mg/l	2 generation
Cyclohexane	Inhalation	Not classified for development	Rat	NOAEL 6.9 mg/l	2 generation
Hexane	Ingestion	Not classified for development	Mouse	NOAEL 2,200 mg/kg/day	during organogenesis
Hexane	Inhalation	Not classified for development	Rat	NOAEL 0.7 mg/l	during gestation
Hexane	Ingestion	Toxic to male reproduction	Rat	NOAEL 1,140 mg/kg/day	90 days
Hexane	Inhalation	Toxic to male reproduction	Rat	LOAEL 3.52 mg/l	28 days

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Propane	Inhalation	cardiac sensitization	Causes damage to organs	Human	NOAEL Not available	
Propane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Propane	Inhalation	respiratory irritation	Not classified	Human	NOAEL Not available	
Acetone	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Acetone	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Acetone	Inhalation	immune system	Not classified	Human	NOAEL 1.19 mg/l	6 hours
Acetone	Inhalation	liver	Not classified	Guinea pig	NOAEL Not available	
Acetone	Ingestion	central nervous	May cause drowsiness or	Human	NOAEL Not	poisoning

		system depression	dizziness		available	and/or abuse
Cyclohexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Cyclohexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human and animal	NOAEL Not available	
Cyclohexane	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Petroleum distillates	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human and animal	NOAEL Not available	
Petroleum distillates	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
Petroleum distillates	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	
Hexane	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	not available
Hexane	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Rabbit	NOAEL Not available	8 hours
Hexane	Inhalation	respiratory system	Not classified	Rat	NOAEL 24.6 mg/l	8 hours

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Acetone	Dermal	eyes	Not classified	Guinea pig	NOAEL Not available	3 weeks
Acetone	Inhalation	hematopoietic system	Not classified	Human	NOAEL 3 mg/l	6 weeks
Acetone	Inhalation	immune system	Not classified	Human	NOAEL 1.19 mg/l	6 days
Acetone	Inhalation	kidney and/or bladder	Not classified	Guinea pig	NOAEL 119 mg/l	not available
Acetone	Inhalation	heart | liver	Not classified	Rat	NOAEL 45 mg/l	8 weeks
Acetone	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 900 mg/kg/day	13 weeks
Acetone	Ingestion	heart	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Acetone	Ingestion	hematopoietic system	Not classified	Rat	NOAEL 200 mg/kg/day	13 weeks
Acetone	Ingestion	liver	Not classified	Mouse	NOAEL 3,896 mg/kg/day	14 days
Acetone	Ingestion	eyes	Not classified	Rat	NOAEL 3,400 mg/kg/day	13 weeks
Acetone	Ingestion	respiratory system	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Acetone	Ingestion	muscles	Not classified	Rat	NOAEL 2,500 mg/kg	13 weeks
Acetone	Ingestion	skin | bone, teeth, nails, and/or hair	Not classified	Mouse	NOAEL 11,298 mg/kg/day	13 weeks
Cyclohexane	Inhalation	liver	Not classified	Rat	NOAEL 24 mg/l	90 days
Cyclohexane	Inhalation	auditory system	Not classified	Rat	NOAEL 1.7 mg/l	90 days

Cyclohexane	Inhalation	kidney and/or bladder	Not classified	Rabbit	NOAEL 2.7 mg/l	10 weeks
Cyclohexane	Inhalation	hematopoietic system	Not classified	Mouse	NOAEL 24 mg/l	14 weeks
Cyclohexane	Inhalation	peripheral nervous system	Not classified	Rat	NOAEL 8.6 mg/l	30 weeks
Hexane	Inhalation	peripheral nervous system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	occupational exposure
Hexane	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Mouse	LOAEL 1.76 mg/l	13 weeks
Hexane	Inhalation	liver	Not classified	Rat	NOAEL Not available	6 months
Hexane	Inhalation	kidney and/or bladder	Not classified	Rat	LOAEL 1.76 mg/l	6 months
Hexane	Inhalation	hematopoietic system	Not classified	Mouse	NOAEL 35.2 mg/l	13 weeks
Hexane	Inhalation	auditory system | immune system | eyes	Not classified	Human	NOAEL Not available	occupational exposure
Hexane	Inhalation	heart | skin | endocrine system	Not classified	Rat	NOAEL 1.76 mg/l	6 months
Hexane	Ingestion	peripheral nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,140 mg/kg/day	90 days
Hexane	Ingestion	endocrine system | hematopoietic system | liver | immune system | kidney and/or bladder	Not classified	Rat	NOAEL Not available	13 weeks

Aspiration Hazard

Name	Value
Cyclohexane	Aspiration hazard
Petroleum distillates	Aspiration hazard
Hexane	Aspiration hazard

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. Facility must be capable of handling aerosol cans.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable)

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

EPCRA 311/312 Hazard Classifications:

Physical Hazards
Flammable (gases, aerosols, liquids, or solids)
Gas under pressure

Health Hazards
Reproductive toxicity
Serious eye damage or eye irritation
Simple Asphyxiant
Specific target organ toxicity (single or repeated exposure)

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Cyclohexane	110-82-7	Trade Secret 10 - 20

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this product are in compliance with the chemical notification requirements of TSCA. All required components of this product are listed on the active portion of the TSCA Inventory.

Contact 3M for more information.

15.4. International Regulations
Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 2 **Flammability:** 4 **Instability:** 0 **Special Hazards:** None
Aerosol Storage Code: 3

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification
Health: *2 **Flammability:** 4 **Physical Hazard:** 0 **Personal Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS® IV) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® IV ratings are to be used with a fully implemented HMIS® IV program. HMIS® is a registered mark of the American Coatings Association (ACA).

Document Group:	16-3472-4	**Version Number:**	40.00
Issue Date:	05/21/18	**Supercedes Date:**	03/31/17

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Safety Data Sheet

Issue Date: 28-Aug-2014 **Revision Date:** 09-Sep-2014 **Version** 1

1. IDENTIFICATION

Product Identifier

Product Name **WAX STICK**

Other means of identification

SDS #

Item # E-6001-01
E-6005-01

Recommended use of the chemical and restrictions on use

Recommended Use Tapping and drilling metal.

Details of the supplier of the safety data sheet

Supplier Address

Ashburn Chemical Technologies
7403 Wright Rd
Houston, TX 77041

Emergency Telephone Number

Company Phone Number 832-399-1000
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	The product contains no substances which, at their given concentration, are considered to be hazardous to health.

Appearance Amber solid **Physical State** Solid

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. FIRST-AID MEASURES

First Aid Measures

General Advice Provide this SDS to medical personnel for treatment.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If irritation develops or persists seek medical attention.

Skin Contact Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation occurs.

Inhalation Not a normal route of exposure. If symptoms develop, move victim to fresh air. If symptoms persist, obtain medical attention.

Ingestion Do not induce vomiting without medical advice. Seek immediate medical attention/advice.

Most important symptoms and effects

Symptoms May cause skin and eye irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical

Not determined.

Hazardous Combustion Products Smoke, Fume, Incomplete combustion products, Oxides of carbon.

Protective equipment and precautions for firefighters

Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus(SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Absorb or cover with dry earth, sand or other non-combustible material.

Methods for Clean-Up Sweep up absorbed material and shovel into suitable containers for disposal. Discard any product, residue, disposable container or liner in full compliance with federal, state, and local regulations. For waste disposal, see section 13 of the SDS.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when handling this product. Wash face, hands, and any exposed skin thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Do not store in open or unlabeled containers. Store away from heat and open flame. Storage temperature > 40 F.

Incompatible Materials Oxidizing agents. Strong acids. Strong bases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s)

Appropriate engineering controls

Engineering Controls Maintain eye wash fountain and quick-drench facilities in work area.

Individual protection measures, such as personal protective equipment

Eye/Face Protection If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection Impervious gloves such as neoprene or solvex can be used.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Avoid contact with skin, eyes and clothing. After handling this product, wash hands before eating, drinking, or smoking. If contact occurs, remove contaminated clothing. If needed, take first aid action shown on section 4 of this SDS. Launder contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Solid		
Appearance	Amber solid	**Odor**	Not determined
Color	Amber	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	Not determined	
Melting Point/Freezing Point	77.77 °C / 172 °F	
Boiling Point/Boiling Range	> 371.11 °C / > 700 °F	
Flash Point	> 212.77 °C / > 415 °F	Pensky-Martens Closed Cup (PMCC)
Evaporation Rate	< 1	(butyl acetate = 1)
Flammability (Solid, Gas)	Not determined	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	< 1.0	(Air=1)
Specific Gravity	0.85	
Water Solubility	Nil	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	

Decomposition Temperature	Not determined
Kinematic Viscosity	Not determined
Dynamic Viscosity	Not determined
Explosive Properties	Not determined
Oxidizing Properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity Not reactive under normal conditions.

Chemical Stability Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid Incompatible Materials.

Incompatible Materials Oxidizing agents. Strong acids. Strong bases.

Hazardous Decomposition Products

Thermal decomposition and combustion are not expected to occur except under extreme conditions.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact May cause temporary irritation on eye contact.

Skin Contact Prolonged contact may cause redness and irritation.

Inhalation Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

Ingestion May cause discomfort if swallowed.

Component Information

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Carcinogenic potential is unknown.

Numerical measures of toxicity Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence/Degradability Not determined.

Bioaccumulation Not determined.

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*
DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*
EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*
ENCS *- Japan Existing and New Chemical Substances*
IECSC *- China Inventory of Existing Chemical Substances*
KECL *- Korean Existing and Evaluated Chemical Substances*
PICCS *- Philippines Inventory of Chemicals and Chemical Substances*
AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 311/312 Hazard Categories
This material, as supplied, does not contain any substances subject to the requirements of SARA Sections 311/312 (40 CFR 370)

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

US State Regulations

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 28-Aug-2014
Revision Date: 22-Dec-2014
Revision Note: New format

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

acc. to OSHA HCS

Printing date 03/08/2016 Reviewed on 01/15/2016

1 Identification

· **Product identifier**

· **Trade name: BÖHLER E7018**
· **CAS Number:** -
· **EINECS Number:** -
· **Application of the substance / the mixture** Shielded Metal Arc Welding Electrode

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
voestalpine Böhler Welding (China) Co., Ltd.
SIP No. 121 Xingpu Road
Suzhou Jiangsu 215126

phone +86 (512) 67631288-0

· **Information department:**
R & D Technology
Dylan Dai

+86 512 6763 1288-1226
Dylan.Dai@voestalpine.com
· **Emergency telephone number:** +86 (512) 6763 1288-1226

2 Hazard(s) identification

· **Classification of the substance or mixture**
The product is not classified according to the Globally Harmonized System (GHS).

· **Label elements** -
· **GHS label elements** Void
· **Hazard pictograms** Void
· **Signal word** Void
· **Hazard statements** Void
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *0
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

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· **Dangerous components:**

CAS: 7789-75-5 EINECS: 232-188-7	calcium fluoride		12.5-25%
CAS: 13463-67-7 EINECS: 236-675-5	titanium dioxide	Carc. 2, H351	2.5-5%
CAS: 14808-60-7 EINECS: 238-878-4	silicon dioxide	Carc. 1A, H350 Acute Tox. 4, H332	0.1-2.5%
CAS: 7439-96-5 EINECS: 231-105-1	manganese		0.1-2.5%
CAS: 1344-28-1 EINECS: 215-691-6	aluminium oxide		0.1-2.5%

4 First-aid measures

· **Description of first aid measures**
· **General information:** No special measures required.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Generally the product does not irritate the skin.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Seek medical treatment.
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Suitable to surrounding conditions
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters** -
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Use respiratory protective device against the effects of fumes/dust/aerosol.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:** Pick up mechanically.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure that suitable extractors are available on processing machines
· **Information about protection against explosions and fires:** No special measures required.

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· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** None.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

7789-75-5 calcium fluoride	
PEL	Long-term value: 2.5 mg/m³ as F
REL	Long-term value: 2.5 mg/m³ as F
TLV	Long-term value: 2.5 mg/m³ as F, BEI
13463-67-7 titanium dioxide	
PEL	Long-term value: 15* mg/m³ *total dust
REL	See Pocket Guide App. A
TLV	Long-term value: 10 mg/m³ withdrawn from NIC
14808-60-7 silicon dioxide	
PEL	see Quartz listing
REL	Long-term value: 0.05* mg/m³ *respirable dust; See Pocket Guide App. A
TLV	Long-term value: 0.025* mg/m³ *as respirable fraction
7439-96-5 manganese	
PEL	Ceiling limit value: 5 mg/m³ as Mn
REL	Short-term value: 3 mg/m³ Long-term value: 1 mg/m³ fume, as Mn
TLV	Long-term value: 0.02* 0.1* mg/m³ as Mn; *respirable **inhalable fraction
1344-28-1 aluminium oxide	
PEL	Long-term value: 15*; 5** mg/m³ *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m³ as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m³ as Al; *as respirable fraction

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· **Ingredients with biological limit values:**

7789-75-5 calcium fluoride

BEI 2 mg/L
Medium: urine
Time: prior to shift
Parameter: Fluoride (background, nonspecific)

3 mg/L
Medium: urine
Time: end of shift
Parameter: Fluoride (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:** Wash hands before breaks and at the end of work.
· **Breathing equipment:** Filter P2
· **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Heat protection gloves (non-combustible)
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Not required.
· **Body protection:**
Protective work clothing
Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, and well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Not determined.
Color:	According to product specification
· **Odor:**	Odorless
· **Odor threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not determined.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.

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· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
Relative density	Not determined.
Vapor density	Not applicable.
Evaporation rate	Not applicable.
Water:	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Dynamic:**	Not applicable.
· **Kinematic:**	Not applicable.
· **Organic solvents:**	0.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **Possibility of hazardous reactions** Attacks materials containing glass and silicate.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Additional toxicological information:**
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

7789-75-5	calcium fluoride	3
13463-67-7	titanium dioxide	2B
14808-60-7	silicon dioxide	1

· **NTP (National Toxicology Program)**

14808-60-7	silicon dioxide	K

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.

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· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must be specially treated adhering to official regulations.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **Transport hazard class(es)**	
· **IATA**	
· **Class**	-
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not dangerous according to the above specifications.
· **UN "Model Regulation":**	-

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredient is listed

· **Section 313 (Specific toxic chemical listings):**

7439-96-5	manganese
1344-28-1	aluminium oxide

· **TSCA (Toxic Substances Control Act):**

7439-89-6	iron
1317-65-3	calcium carbonate

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7789-75-5	calcium fluoride
13463-67-7	titanium dioxide
14808-60-7	silicon dioxide
7439-96-5	manganese
1344-28-1	aluminium oxide

· **Proposition 65**

· **Chemicals known to cause cancer:**

13463-67-7	titanium dioxide
14808-60-7	silicon dioxide

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

7439-96-5	manganese	D

· **TLV (Threshold Limit Value established by ACGIH)**

7789-75-5	calcium fluoride	A4
13463-67-7	titanium dioxide	A4
14808-60-7	silicon dioxide	A2
1344-28-1	aluminium oxide	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

13463-67-7	titanium dioxide
14808-60-7	silicon dioxide

· **GHS label elements** Void
· **Hazard pictograms** Void
· **Signal word** Void
· **Hazard statements** Void
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Additional information:**
Recommendations for exposure scenarios, measures for risk management and identification of working conditions under which metals, metal alloys and products made of metal can be safely worked can be found attached.

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Trade name: BÖHLER E7018

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Detailed information can be found on our webpage www.voestalpine.com (Environment, REACH at voestalpine).

Welding Exposure Scenario WES - ENGL **EWA2011**

Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles may be safely welded

Welding/Brazing produces fumes which can affect human health and the environment. Fumes are a varying mixture of airborne gases and fine particles which, if inhaled or swallowed, constitute a health hazard. The degree of risk will depend on the composition of the fume, concentration of the fume and duration of exposure. The fume composition is dependent upon the material being worked, the process and consumables being used, coatings on the work such as paint, galvanizing or plating, oil or contaminants from cleaning and degreasing activities. A systematic approach to the assessment of exposure is necessary, taking into account the particular circumstances for the operator and ancillary worker that can be exposed.

Considering the emission of fumes when welding, brazing or cutting of metals, it is recommended to (1) arrange risk management measures through applying general information and guidelines provided by this exposure scenario and (2) using the information provided by the Safety Data Sheet, issued in accordance with REACH, by the welding consumable manufacturer.

The employer shall ensure that the risk from welding fumes to the safety and health of workers is eliminated or reduced to a minimum. The following principle shall be applied:

1- Select the applicable process/material combinations with the lowest class, whenever possible.
2- Set welding process with the lowest emission parameter.
3- Apply the relevant collective protective measure in accordance with class number. In general, the use of PPE is taken into account after all other measures is applied.
4- Wear the relevant personal protective equipment in accordance with the duty cycle.

In addition, compliance with the National Regulations regarding the exposure to welding fumes of welders and related personnel shall be verified.

In the table "Risk Management Measures for individual process / material combinations" below, reference is made to the following standards for collective and personal protection measures:

ISO 4063	Welding process Reference Numbers according to ISO 4063
EN ISO 15012-1:2004	Health and safety in welding and allied processes - Requirements testing and marking of equipment or air filtration - Part 1: Testing of the separation efficiency for welding fume
EN ISO 15012-2:2008	Health and safety in welding and allied processes - Requirements, testing and marking of equipment for air filtration - Part 2: Determination of the minimum air volume flow rate of captor hoods and nozzles
EN 149:2001	Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking (FFP1 - FFP2 - FFP3)
EN 1835:2000	Respiratory protective devices. Light duty construction compressed air line breathing apparatus incorporating a helmet or a hood. Requirements, testing, marking (LDH1 - LDH2 - LDH3).
EN 12941:1998	Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood. Requirements, testing, marking (TH1 - TH2 - TH3).
EN 143:2000	Respiratory protective devices — Particle filters — Requirements, testing, marking (P1, P2, P3)
Directive 1998/24/EC	Article 6.2 on the protection of the health and safety of workers from the risks related to chemical agents at work
BGR 190	Benutzung von Atemschutzgeräten (Berufsgenossenschaftliche Regel für Sicherheit und Gesundheit bei der Arbeit)
TRGS 528	Schweisstechnische Arbeiten (Technische Regeln für Gefahrstoffe)

Also in the table "Risk Management Measures for individual process / material combinations", reference is made to footnotes.
The description of these footnotes:

[1] Class: approximate ranking to mitigate risk by selecting process/material combinations with the lowest value. Identified collective and individual risk management measures shall be applied
[2] Personal Protective Equipment (PPE) required avoiding exceeding the National Exposure Limit Value (DC: Duty cycle expressed on 8 hours)
[3] General Ventilation (GV) Low. With additional Local Exhaust Ventilation (LEV) and extracted air to the outside, the GV or LEV capacity may be reduced to 1/5 of the original requirement.
[4] General Ventilation (GV) Medium (double compared to Low)
[5] Filtrating half mask (FFP2)
[6] When an alloyed consumable is used, measures from "Class V" are required
[7] General Ventilation (GV) Low. When no Local Exhaust Ventilation, the ventilation requirement is 5-fold
[8] Filtrating half mask (FFP3), helmet with powered filters (TH2/P2), or helmet with external air supply (LDH2)
[9] Reduced (negative) pressured Area: A separate, ventilated area where reduced (negative) pressure, compared to the surrounded area, is maintained
[10] Local Exhaust Ventilation (LEV) High, extraction at source (includes table, hood, arm or torch extraction)
[11] Helmet with powered filters (TH3/P3), or helmet with external air supply (LDH3)
[12] Local Exhaust Ventilation (LEV) Low, extraction at source (includes table, hood, arm or torch extraction)
[13] Local Exhaust Ventilation (LEV) Medium, extraction at source (includes table, hood, arm or torch extraction)
[14] Recommended measures to comply with national maximum allowable limits. Extracted fumes, for all materials except unalloyed steel and aluminium, shall be filtered before release in the outside environment.
[15] A confined space, despite its name, is not necessarily small. Examples of confined spaces include ship, silos, vats, utility vaults, tanks, etc.
[16] Improved helmet, designed to avoid direct flow of welding fumes inside
n.a. Not applicable
n.r. Not recommended

(Contd. on page 9)

Safety Data Sheet

acc. to OSHA HCS

Printing date 03/08/2016 *Reviewed on 01/15/2016*

Trade name: BÖHLER E7018

(Contd. of page 8)

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Welding Exposure Scenario WES - ENGL **EWA2011**

Risk Management Measures for individual process / base material combinations

Class[1]	Process (according to ISO 4063)	Base Materials	Remarks	Ventilation / Extraction / Filtration[14]	PPE[2] DC<15%	PPE[2] DC>15%
Non-confined space[15]						
I	GTAW 141	All	Except Aluminium	GV low[3]	n.r.	n.r.
	SAW 12					
	Autogeneous 3					
	PAW 15					
	ESW/EGW 72/73					
	Resistance 2					
	Stud welding 78					
	Solid state 521					
	Gases Brazing 9	All	Except Cd- alloys	GV low[3]	n.r.	n.r.
II	GTAW 141	Aluminium	n.a.	GV medium[4]	n.a.	FFP2[5]
III	MMAW 111	All	Except Be-, V- , Mn-, Ni- alloys and Stainless[6]	GV low[7] LEV low[12]	Improved helmet[16]	FFP2[5]
	FCAW 136/137	All	Except Stainless and Ni- alloys [6]			
	GMAW 131/135	All	Except Cu-, Be-, V- alloys[6]			
	Powder Plasma Arc 152	All	Except Be-, V-, Cu- , Mn-, Ni-alloys and Stainless [6]			
IV	All processes class I	Painted / primed / oiled	No Pb containing primer	GV low[3]	FFP2[5]	FFP3, TH2/P2, or LDH2[8]
	All processes class III	Painted / primed / oiled	No Pb containing primer	GV low [7] LEV low[12]		
V	MMAW 111	Stainless, Ni-, Be-, and V- alloys	n.a.	LEV high[10]	TH3/P3, LDH3[11]	TH3/P3, LDH3[11]
	FCAW 136/137	Stainless, Mn- and Ni- alloys				
	GMAW 131	Cu-alloys				
	Powder Plasma Arc 152	Stainless, Mn-, Ni-, and Cu- alloys				
VI	GMAW 131	Be-, and V- alloys	n.a.	Reduced (negative) pressured area [9] LEV low[12]	TH3/P3, LDH3[11]	TH3/P3, LDH3[11]
	Powder Plasma Arc 152					
VII	Self shielded FCAW 114	Un-, high alloyed steel	Cored wire, not containing Ba	Reduced (negative) pressured area [9] LEV medium[13]	TH3/P3, LDH3[11]	TH3/P3, LDH3[11]
	Self shielded FCAW 114	Un-, high alloyed steel	Cored wire, containing Ba	Reduced (negative) pressured area [9] LEV high[10]		
	All	Painted / primed	Paint / Primer containing Pb			
	Arc Gouging and Cutting 8	All	n.a.			
	Thermal Spray	All	n.a.			
	Gases Brazing 9	Cd- alloys	n.a.			
Closed system or Confined space[15]						
I	Laser Welding 52	All	Closed system	GV medium[4]	n.a.	n.a.
	Laser Cutting 84					
	Electron Beam 51					
VIII	All	All	Confined space	LEV high[10] External air supply	LDH3[11]	LDH3[11]

· ***Department issuing SDS:*** *R&D*
· ***Contact:*** *Dylan Dai*
· ***Date of preparation / last revision*** *03/08/2016 / 2*
· ***Abbreviations and acronyms:***
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists

Safety Data Sheet

24 Hour Emergency Phone Numbers
Medical/Poison Control:
In U.S.: Call 1-800-222-1222

Outside U.S.: Call your local poison control center

Transportation/National Response Center:

1-800-535-5053
1-352-323-3500

NOTE: The National ResponseCenter emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

IMPORTANT: Provide this information to employees, customers, and users of this product. Read this SDS before handling or disposing of this product. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard. All abbreviated terms used in this MSDS are further described in Section 16.

1. Identification

This Safety Data Sheet is available in American Spanish upon request.
Los Datos de Serguridad pueden obtenerse en Espanol si lo riquiere.

Product Name:	Cove Base Construction Adhesive	**Revision Date:**	6/19/2015
Product UPC Number:	25054, 25053, 10934	**Supercedes Date:**	New SDS
Product Use/Class:	Construction Adhesive	**SDS No:**	00030802001
Manufacturer:	DAP Products Inc. 2400 Boston Street Suite 200 Baltimore, MD 21224-4723 888-327-8477 (non - emergency matters)		
Preparer:	Regulatory Department		

2. Hazards Identification

EMERGENCY OVERVIEW: May cause eye, skin, nose, throat and respiratory tract irritation. Harmful if swallowed or absorbed through the skin.

GHS Classification
Not a hazardous substance or mixture.

Symbol(s) of Product

None

Signal Word
Not a hazardous substance or mixture.

3. Composition/Information on Ingredients

Chemical Name	CAS-No.	Wt. %	GHS Symbols	GHS Statements
Calcium Carbonate	471-34-1	25-50	GHS03-GHS07	H270-332
Magnesite	546-93-0	2.5-10	GHS03	H270

Attapulgite	12174-11-7	2.5-10 GHS03-GHS07	H270-332

The text for GHS Hazard Statements shown above (if any) is given in the "Other information" Section.

4. First-aid Measures

FIRST AID - INHALATION: If inhaled, remove to fresh air. If breathing is difficult, leave the area to obtain fresh air. If continued breathing difficulty is experienced, get medical attention immediately.

FIRST AID - SKIN CONTACT: Remove and wash contaminated clothing. Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical aid if symptoms persist.

FIRST AID - EYE CONTACT: In case of contact, immediately flush eyes with large quantities of water for at least 15 minutes until irritation subsides. Get medical attention immediately.

FIRST AID - INGESTION: If swallowed, DO NOT INDUCE VOMITING. Get medical attention immediately.

5. Fire-fighting Measures

UNUSUAL FIRE AND EXPLOSION HAZARDS: 465 <undefined>

SPECIAL FIREFIGHTING PROCEDURES: Wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear. Use water spray to cool exposed surfaces.

EXTINGUISHING MEDIA: Carbon Dioxide, Dry Chemical, Foam, Water Fog

6. Accidental Release Measures

ENVIRONMENTAL MEASURES: No Information

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Contain spilled material and remove with inert absorbent. Dispose of contaminated absorbent, container and unused contents in accordance with local, state and federal regulations. Scrape up dried material and place into containers. Use personal protective equipment as necessary. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations.

7. Handling and Storage

HANDLING: KEEP OUT OF REACH OF CHILDREN!DO NOT TAKE INTERNALLY. Avoid breathing vapor and contact with eyes, skin and clothing. Use only with adequate ventilation. Open all windows and doors or use other means to ensure cross-ventilation and fresh air entry during application and drying. Odor is not an adequate warning for hazardous conditions. Wash thoroughly after handling.

STORAGE: Avoid excessive heat and freezing. Do not store at temperatures above 120 degrees F. Store away from caustics and oxidizers.

8. Exposure Controls/Personal Protection

Ingredients with Occupational Exposure Limits

Chemical Name	ACGIH TLV-TWA	ACGIH-TLV STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Calcium Carbonate	N.E.	N.E.	N.E.	N.E.
Magnesite	N.E.	N.E.	15 mg/m3 TWA total dust, 5 mg/m3 TWA respirable fraction	N.E.
Attapulgite	N.E.	N.E.	N.E.	N.E.

Further Advice: MEL = Maximum Exposure Limit OES = Occupational Exposure Standard SUP = Supplier's Recommendation Sk = Skin Sensitizer N.E. = Not Established

Personal Protection



RESPIRATORY PROTECTION: No personal respiratory protective equipment normally required. In case of insufficient ventilation, wear suitable respiratory equipment.



SKIN PROTECTION: Rubber gloves.



EYE PROTECTION: Goggles or safety glasses with side shields.



OTHER PROTECTIVE EQUIPMENT: Not required under normal use.



HYGIENIC PRACTICES: Wash hands before breaks and at the end of workday. Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

Appearance:	White to Off-White	**Physical State:**	Paste
Odor:	Very Slight Ammonia	**Odor Threshold:**	Not Established
Density, g/cm3:	1.42 - 1.42	**pH:**	Between 7.0 and 12.0
Freeze Point, °C:	Not Established	**Viscosity (mPa.s):**	Not Established
Solubility in Water:	Not Established	**Partition Coeff., n-octanol/water:**	Not Established
Decomposition Temperature, °C:	Not Established	**Explosive Limits, %:**	N.I. - N.I.
Boiling Range, °C:	N.I. - N.I.	**Auto-Ignition Temperature, °C**	Not Established
Minimum Flash Point, °C:	93.3	**Vapor Pressure, mmHg:**	No Information
Evaporation Rate:	Slower Than n-Butyl Acetate	**Flash Method:**	Seta Closed Cup
Vapor Density:	Heavier Than Air	**Flammability:**	No Information
Combustibility:	Does not support combustion		

(See "Other information" Section for abbreviation legend)
(If product is an aerosol, the flash point stated above is that of the propellant.)

10. Stability and Reactivity

STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID: Excessive heat and freezing.

INCOMPATIBILITY: Incompatible with strong bases and oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Normal decomposition products, i.e., COx, NOx.

11. Toxicological Information

EFFECT OF OVEREXPOSURE - INHALATION: May be harmful if inhaled. Inhalation may cause irritation to the respiratory tract (nose, mouth, mucous membranes).

EFFECT OF OVEREXPOSURE - SKIN CONTACT: Prolonged or repeated contact with skin may cause mild irritation.

EFFECT OF OVEREXPOSURE - EYE CONTACT: May cause eye irritation of susceptible persons.

EFFECT OF OVEREXPOSURE - INGESTION: Harmful if swallowed.

CARCINOGENICITY: No Information

EFFECT OF OVEREXPOSURE - CHRONIC HAZARDS: Prolonged and repeated skin contact may cause irritation and possibly dermatitis.

PRIMARY ROUTE(S) OF ENTRY: Inhalation, Skin Contact

Acute Toxicity Values
The acute effects of this product have not been tested. Data on individual components are tabulated below

CAS-No.	Chemical Name	Oral LD50	Dermal LD50	Vapor LC50
471-34-1	Calcium Carbonate	6450 mg/kg Rat	>2000 mg/kg Rat	>20 mg/L
546-93-0	Magnesite	>2000 mg/kg Rat	>2000 mg/kg	>20 mg/L
12174-11-7	Attapulgite	N.I.	N.I.	20 mg/kg

N.I. = No Information

12. Ecological Information

ECOLOGICAL INFORMATION: Ecological injuries are not known or expected under normal use.

13. Disposal Information

DISPOSAL INFORMATION: This product does not meet the definition of a hazardous waste according to U.S. EPA Hazardous Waste Management Regulation, 40 CFR Section 261. Dispose as hazardous waste according to all local, state, federal and provincial regulations. State and Local regulations/restrictions are complex and may differ from Federal regulations. Responsibility for proper waste disposal is with the owner of the waste.

14. Transport Information

SPECIAL TRANSPORT PRECAUTIONS: No Information

DOT UN/NA Number:	N.A.
DOT Proper Shipping Name:	Not Regulated.
DOT Technical Name:	N.A.
DOT Hazard Class:	N.A.
Hazard SubClass:	N.A.
Packing Group:	N.A.

15. Regulatory Information

U.S. Federal Regulations:

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Acute Health Hazard, Chronic Health Hazard

SARA SECTION 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

No Sara 313 components exist in this product.

TOXIC SUBSTANCES CONTROL ACT:

All ingredients in this product are either on TSCA inventory list, or otherwise exempt.
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

No TSCA 12(b) components exist in this product.

CALIFORNIA PROPOSITION 65 CARCINOGENS AND REPORODUCTIVE TOXINS

CALIFORNIA PROPOSITION 65: No Information

International Regulations: As follows -

CANADIAN WHMIS:

This SDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

WHMIS Class Consumer Commodity

16. Other Information

Revision Date: 6/19/2015 **Supersedes Date:** New MSDS

Reason for revision: HazCom2012/GHS Conversion

Datasheet produced by: Regulatory Department

HMIS Ratings:

Health:	1	**Flammability:**	1	**Reactivity:**	0	**Personal Protection:**	X

VOC Less Water Less Exempt Solvent, g/L26.4

VOC Material, g/L:11

VOC as Defined by California Consumer Product Regulation, Wt/Wt%:0.3

Text for GHS Hazard Statements shown in Section 3 describing each ingredient:

H270 May cause or intensify fire; oxidiser.
H332 Harmful if inhaled.

Icons for GHS Pictograms shown in Section 3 describing each ingredient:

GHS03



GHS07



Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

DAP believes the data and statements contained herein are accurate as of the date hereof. They are offered in good faith as typical values and not as a product specification. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE WITH REGARD TO THE INFORMATION HEREIN PROVIDED OR THE PRODUCT TO WHICH THE INFORMATION REFERS. Since thisdocument is intended only as a guide to the appropriate use and precautionary handling of the referenced product by a properly trained person, it is therefore the responsibility of the user to (i) review the recommendations with due consideration for the specific context of the intended use and (ii) determine if they are appropriate.

Safety Data Sheet

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Outside U.S.: Call your local poison control center

Transportation/National Response Center:

1-800-535-5053
1-352-323-3500

NOTE: The National ResponseCenter emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

IMPORTANT: Provide this information to employees, customers, and users of this product. Read this SDS before handling or disposing of this product. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard. All abbreviated terms used in this SDS are further described in Section 16.

1. Identification

This Safety Data Sheet is available in American Spanish upon request.
Los Datos de Serguridad pueden obtenerse en Espanol si lo riquiere.

Product Name:	Weldwood Original Contact Cement	**Revision Date:**	6/19/2015
Product UPC Number:	00271, 00272, 00273	**Supercedes Date:**	New SDS
Product Use/Class:	Contact Adhesive	**SDS No:**	00030503001
Manufacturer:	DAP Products Inc. 2400 Boston Street Suite 200 Baltimore, MD 21224-4723 888-327-8477 (non - emergency matters)	**Preparer:**	Regulatory Department

Emergency Telephone: 1-800-535-5053, 1-352-323-3500, 1-800-222-1222

Safety Data Sheet Coordinator: MSDS@DAP.com

2. Hazards Identification

EMERGENCY OVERVIEW: DANGER!Flammable liquid and vapor. Vapors may cause flash fire or explosion. Vapors can form an ignitable mixture with air. Vapors can flow along surfaces to a distant ignition source and flash back. Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Keep container closed and away from heat, sparks, and open flame. Store away from caustics and oxidizers. Avoid breathing vapor. Avoid skin and eye contact. Use only with adequate ventilation. Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation. Irritating to eyes, respiratory system and skin. Harmful or fatal if swallowed. Aspiration hazard if swallowed - can enter lungs and cause damage. May affect the brain or nervous system causing dizziness, headache or nausea.

GHS Classification
Acute Tox. 4 Inhalation, Acute Tox. 4 Oral, Carc. 1B, Eye Irrit. 2, Flam. Liq. 2, Muta. 1B, Skin Irrit. 2, STOT RE 2, STOT SE 3 NE, STOT SE 3 RTI

Symbol(s) of Product



Signal Word
Danger

GHS HAZARD STATEMENTS

Flammable Liquid, category 2	H225	Highly flammable liquid and vapour.
Acute Toxicity, Oral, category 4	H302	Harmful if swallowed.
Skin Irritation, category 2	H315	Causes skin irritation.
Eye Irritation, category 2	H319	Causes serious eye irritation.
Acute Toxicity, Inhalation, category 4	H332	Harmful if inhaled.
STOT, single exposure, category 3, RTI	H335	May cause respiratory irritation.
STOT, single exposure, category 3, NE	H336	May cause drowsiness or dizziness.
Germ Cell Mutagenicity, category 1B	H340	May cause genetic defects . Classified as mutagenic Category 1 if one ingredient is present at or above 0.1% Applies to liquids, Solids (w/w units) and gases (v/v). The substance may also have its own exposure limit. Routes of exposure are dependant on ingredient form.
Carcinogenicity, category 1B	H350	May cause cancer. Classified as carcinogenic Category 1 on the basis of epidemiological and/or animal data. Mixtures are classified as carcinogenic when at least 1 ingredient has been classified as carcinogenic and is present at 0.1% or above Routes of exposure are dependant on ingredient form.
STOT, repeated exposure, category 2	H373	May cause damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.

GHS LABEL PRECAUTIONARY STATEMENTS

P201	Obtain special instructions before use.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

GHS SDS PRECAUTIONARY STATEMENTS

P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/.../ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P270	Do no eat, drink or smoke when using this product.

3. Composition/Information on Ingredients

Chemical Name	CAS-No.	Wt. %	GHS Symbols	GHS Statements
Toluene	108-88-3	50-75	GHS02-GHS03-GHS07-GHS08	H225-270-302-304-315-332-335-336-373
Methyl ethyl ketone (MEK)	78-93-3	10-25	GHS02-GHS03-GHS07	H225-270-319-332-336

Light aliphatic solvent naphtha	64742-89-8	2.5-10	GHS03-GHS06-GHS08	H270-304-331-340-350
n-Heptane	142-82-5	2.5-10	GHS02-GHS03-GHS07-GHS08	H225-270-304-315-336
Magnesium oxide fume	1309-48-4	1.0-2.5	GHS03	H270

The text for GHS Hazard Statements shown above (if any) is given in the "Other information" Section.

4. First-aid Measures

FIRST AID - INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. NOTE: Only trained personnel should administer artificial respiration or give oxygen.

FIRST AID - SKIN CONTACT: Wash skin with soap and water for 15 minutes. Get medical aid if symptoms persist. Remove and wash contaminated clothing. DO NOT try to peel the solidified material from the skin or use solvents or thinners to dissolve it. The use of vegetable oil or mineral oil is recommended for removal of this material from the skin. Flush exposed area with water while removing contaminated clothing. Get medical attention if irritation persists. To remove from skin, remove completely with a dry cloth or paper towel, before washing with detergent and water.

FIRST AID - EYE CONTACT: If material gets into eyes, flush with water immediately for 15 minutes. Consult a physician.

FIRST AID - INGESTION: If swallowed, DO NOT INDUCE VOMITING. Get medical attention immediately.

5. Fire-fighting Measures

UNUSUAL FIRE AND EXPLOSION HAZARDS: Eliminate sources of ignition: heat, electrical equipment, sparks and flames. Vapors can form an ignitable mixture with air. Vapors can flow along surfaces to a distant ignition source and flash back. Vapors may form explosive mixtures with air. Containers may explode if exposed to extreme heat. Empty containers retain product residue (liquid and/or vapor). Vapor can ignite potentially causing an explosion.

SPECIAL FIREFIGHTING PROCEDURES: Wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear. Use water spray to cool exposed surfaces. Cool fire-exposed containers using water spray.

EXTINGUISHING MEDIA: Carbon Dioxide, Dry Chemical, Foam

6. Accidental Release Measures

ENVIRONMENTAL MEASURES: No Information

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: NOTE: Review fire hazards before proceeding with clean up. Immediately eliminate sources of ignition. Keep people away from and upwind of spill/leak. Scrape up dried material and place into containers. Prevent product from entering drains. Soak up with inert absorbent material and dispose of as hazardous waste. Read all product instructions before using. Personal protective equipment should include impervious gloves, protective eye wear, and suitable work clothes.

7. Handling and Storage

HANDLING: KEEP OUT OF REACH OF CHILDREN!DO NOT TAKE INTERNALLY. Remove all sources of ignition. Keep away from open flames, hot surfaces and sources of ignition. Provide adequate ventilation. Avoid heat, sparks and open flames. Wear appropriate personal protection. Avoid breathing vapor and contact with eyes, skin and clothing. Use in well ventilated area. Open all windows and doors or use other means to ensure cross-ventilation and fresh air entry during application and drying. Odor is not an adequate warning for hazardous conditions. Empty containers retain product residue (liquid and/or vapor). Vapor can ignite potentially causing an explosion. Wash thoroughly after handling. Do not use in areas where static sparks may be generated. Intentional misuse by deliberately concentrating and inhaling vapors may be harmful or fatal. Construction and repair activities can adversely affect indoor air quality. Consult with occupants or a representative (i.e. maintenance, building manager, industrial hygienist, or safety officer) to determine ways to minimize impact.

STORAGE: Store away from sources of ignition and heat. Do not store at temperatures above 120 degrees F. Store containers away from excessive heat and freezing. Store away from caustics and oxidizers. Keep containers tightly closed.

8. Exposure Controls/Personal Protection

Ingredients with Occupational Exposure Limits

Chemical Name	ACGIH TLV-TWA	ACGIH-TLV STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Toluene	20 ppm TWA	N.E.	200 ppm TWA	300 ppm Ceiling
Methyl ethyl ketone (MEK)	200 ppm TWA	300 ppm STEL	200 ppm TWA, 590 mg/m3 TWA	N.E.
Light aliphatic solvent naphtha	N.E.	N.E.	N.E.	N.E.
n-Heptane	400 ppm TWA Heptane, all isomers	500 ppm STEL Heptane, all isomers	500 ppm TWA, 2000 mg/m3 TWA	N.E.

Magnesium oxide fume	10 mg/m3 TWA inhalable fraction	N.E.	15 mg/m3 TWA fume, total particulate	N.E.

Further Advice: MEL = Maximum Exposure Limit OES = Occupational Exposure Standard SUP = Supplier's Recommendation Sk = Skin Sensitizer N.E. = Not Established

Personal Protection



RESPIRATORY PROTECTION: A NIOSH-approved air purifying respirator with an organic vapor cartridge or canister may be necessary under certain circumstances where airborne concentrations are expected to exceed exposure limits. If concentrations exceed the exposure limits specified, use of a NIOSH-approved supplied air respirator is recommended. Where the protection factor is exceeded, use of a Self Contained Breathing Apparatus (SCBA) may be necessary. If you experience eye watering, headache or dizziness or if air monitoring demonstrates vapor/mist levels are above applicable limits, wear and appropriate, properly fitted respirator (NIOSH approved) during and after application. A respiratory protection program that meets the OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.



SKIN PROTECTION: Solvent-resistant gloves.



EYE PROTECTION: Goggles or safety glasses with side shields.



OTHER PROTECTIVE EQUIPMENT: Provide eyewash and solvent impervious apron if body contact may occur.



HYGIENIC PRACTICES: Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

Appearance:	Tan	**Physical State:**	Liquid
Odor:	Strong Solvent	**Odor Threshold:**	Not Established
Density, g/cm3:	0.88 - 0.88	**pH:**	Not Applicable
Freeze Point, °C:	Not Established	**Viscosity (mPa.s):**	Not Established
Solubility in Water:	No Information	**Partition Coeff., n-octanol/water:**	Not Established
Decomposition Temperature, °C:	Not Established	**Explosive Limits, %:**	N.I. - N.I.
Boiling Range, °C:	N.I. - N.I.	**Auto-ignition Temperature, °C**	Not Established
Minimum Flash Point, °C:	-6.1	**Vapor Pressure, mmHg:**	No Information
Evaporation Rate:	Faster Than n-Butyl Acetate	**Flash Method:**	Seta Closed Cup
Vapor Density:	Heavier Than Air	**Flammability:**	No Information
Combustibility:	Does not support combustion		

(See "Other information" Section for abbreviation legend)
(If product is an aerosol, the flash point stated above is that of the propellant.)

10. Stability and Reactivity

STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID: Keep away from open flames, hot surfaces and sources of ignition. Keep away from oxidizing agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions. Avoid contact with skin, eyes and clothing. Do not smoke.

INCOMPATIBILITY: Open flames, hot surfaces and sources of ignition. Keep away from strong oxidizing agents, heat and open

flames. Exothermic reaction with strong acids. Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.

HAZARDOUS DECOMPOSITION PRODUCTS: Normal decomposition products, i.e., COx, NOx.

11. Toxicological Information

EFFECT OF OVEREXPOSURE - INHALATION: Inhalation of vapors may cause irritation of the nose, throat, lungs and respiratory tract. Inhalation of vapors in high concentration may cause shortness of breath (lung edema). Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Prolonged, repeated or high exposures may cause central nervous system depression leading to headaches, nausea, drowsiness, dizziness, and possibly narcosis. In extreme cases, may cause loss of consciousness.

EFFECT OF OVEREXPOSURE - SKIN CONTACT: Harmful if absorbed through the skin. May cause skin irritation. Prolonged and repeated skin contact may cause dermatitis, drying and defatting due to the solvent properties.

EFFECT OF OVEREXPOSURE - EYE CONTACT: May cause eye irritation. Signs and symptoms may include: pain, tears, swelling, redness and blurred vision.

EFFECT OF OVEREXPOSURE - INGESTION: Harmful or fatal if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause gastrointestinal disturbances with dizziness and central nervous system depression. If ingested, may cause depressed respiration. Aspiration hazard if swallowed. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis, which can be fatal.

CARCINOGENICITY: No Information

EFFECT OF OVEREXPOSURE - CHRONIC HAZARDS: Repeated or prolonged exposure may cause skin, respiratory, kidney and liver damage. May cause kidney and liver damage as well as developmental and reproductive toxicity. Prolonged or repeated inhalation of solvent vapors may cause irregular heartbeat. NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Symptoms include: loss of memory, loss of intellectual ability and loss of coordination. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Overexposure or misuse of toluene can cause liver, kidney, and brain damage as well as cardiac abnormalities. There have been cases of aplastic anemia from toluene in industrial exposures (ACGIH, 1992). Increased coagulation time and reduced clotting factors have also been found, which are indicators of damage to the bone marrow (Clayton & Clayton, 1994). Symptoms include: loss of memory, loss of intellectual ability and loss of coordination.

PRIMARY ROUTE(S) OF ENTRY: Inhalation, Skin Contact

Acute Toxicity Values
The acute effects of this product have not been tested. Data on individual components are tabulated below

CAS-No.	Chemical Name	Oral LD50	Dermal LD50	Vapor LC50
108-88-3	Toluene	636 mg/kg Rat	8390 mg/kg Rabbit	12.5 mg/L Rat
78-93-3	Methyl ethyl ketone (MEK)	>2737 mg/kg Rat	>5000 mg/kg Rabbit	23.5 mg/L Rat
64742-89-8	Light aliphatic solvent naphtha	5000 mk/kg Mouse	3000 mg/kg Rabbit	> 4.96 mg/L Rat
142-82-5	n-Heptane	5000 mg/kg Rat	3000 mg/kg Rabbit	> 29.29 mg/L Rat
1309-48-4	Magnesium oxide fume	>2000 mg/kg	>2000 mg/kg	>20 mg/L

N.I. = No Information

12. Ecological Information

ECOLOGICAL INFORMATION: Ecological injuries are not known or expected under normal use.

13. Disposal Information

DISPOSAL INFORMATION: Residues and spilled material are hazardous waste due to ignitability. Dispose of material in accordance with all federal, state and local regulations. State and Local regulations/restrictions are complex and may differ from Federal regulations. Responsibility for proper waste disposal is with the owner of the waste. Liquids cannot be disposed of in a landfill. Do not flush into surface water or sanitary sewer system. Do not empty into drains. Do not re-use empty containers. The container for this product can present explosion or fire hazards, even when emptied. To avoid risk of injury, do not cut, puncture, or weld on or near this container.

14. Transport Information

SPECIAL TRANSPORT PRECAUTIONS: No Information

DOT UN/NA Number:	UN1133
DOT Proper Shipping Name:	Adhesives, containing a flammable liquid.
DOT Technical Name:	N.A.
DOT Hazard Class:	3
Hazard SubClass:	N.A.
Packing Group:	III

15. Regulatory Information

U.S. Federal Regulations:

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

SARA SECTION 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

Chemical Name	CAS-No.
Toluene	108-88-3

TOXIC SUBSTANCES CONTROL ACT:

All ingredients in this product are either on TSCA inventory list, or otherwise exempt.
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

No TSCA 12(b) components exist in this product.

CALIFORNIA PROPOSITION 65 CARCINOGENS AND REPRODUCTIVE TOXINS

CALIFORNIA PROPOSITION 65: No Information

International Regulations: As follows -

CANADIAN WHMIS:

This SDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

WHMIS Class No Information

16. Other Information

Revision Date:	6/19/2015	**Supersedes Date:**	New MSDS
Reason for revision:	HazCom2012/GHS Conversion		
Datasheet produced by:	Regulatory Department		

HMIS Ratings:

Health:	2	Flammability:	3	Reactivity:	0	Personal Protection:	X

VOC Less Water Less Exempt Solvent, g/L 705.5

VOC Material, g/L: 704

VOC as Defined by California Consumer Product Regulation, Wt/Wt%: 80.4

Text for GHS Hazard Statements shown in Section 3 describing each ingredient:

H225 Highly flammable liquid and vapour.

H270	May cause or intensify fire; oxidiser.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

Icons for GHS Pictograms shown in Section 3 describing each ingredient:

GHS02



GHS03



GHS06



GHS07



GHS08



Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

DAP believes the data and statements contained herein are accurate as of the date hereof. They are offered in good faith as typical values and not as a product specification. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE WITH REGARD TO THE INFORMATION HEREIN PROVIDED OR THE PRODUCT TO WHICH THE INFORMATION REFERS. Since thisdocument is intended only as a guide to the appropriate use and precautionary handling of the referenced product by a properly trained person, it is therefore the responsibility of the user to (i) review the recommendations with due consideration for the specific context of the intended use and (ii) determine if they are appropriate.

SAFETY DATA SHEET

DOW CORNING(R) 795 SILICONE BUILDING SEALANT, BLACK

Version	Revision Date:	SDS Number:	Date of last issue: 03/09/2017
5.0	09/14/2017	1099131-00010	Date of first issue: 01/13/2015

SECTION 1. IDENTIFICATION

Product name : DOW CORNING(R) 795 SILICONE BUILDING SEALANT, BLACK

Product code : 000000000001595709

Manufacturer or supplier's details

Company name of supplier : Dow Corning Corporation

Address : South Saginaw Road
Midland Michigan 48686

Telephone : (989) 496-6000

Emergency telephone : 24 Hour Emergency Telephone : (989) 496-5900
CHEMTREC : (800) 424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Adhesive, binding agents

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Precautionary Statements :

Prevention:

P271 Use only outdoors or in a well-ventilated area.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Silicone elastomer

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
Calcium carbonate treated with stearic acid	Not Assigned	>= 51 - <= 52
Amorphous fumed silica	112945-52-5	>= 3 - <= 4
Carbon black	1333-86-4	>= 0.46 - <= 0.94
Quartz	14808-60-7	>= 0.2 - <= 0.21
Methanol	67-56-1	>= 0.18 - <= 0.19

SECTION 4. FIRST AID MEASURES

General advice	:	In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	:	If inhaled, remove to fresh air. Get medical attention.
In case of skin contact	:	In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.
If swallowed	:	If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Vapors may form explosive mixtures with air. Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Metal oxides Formaldehyde Silicon oxides
Specific extinguishing meth-	:	Use extinguishing measures that are appropriate to local cir-

ods		cumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.
Environmental precautions	:	Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	:	Use only with adequate ventilation.
Advice on safe handling	:	Do not swallow. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Take care to prevent spills, waste and minimize release to the environment.
Conditions for safe storage	:	Keep in properly labeled containers.

Store in accordance with the particular national regulations.

Materials to avoid : Do not store with the following product types:
Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Calcium carbonate treated with stearic acid	Not Assigned	TWA (Respirable)	5 mg/m³ (Calcium carbonate)	NIOSH REL
		TWA (total)	10 mg/m³ (Calcium carbonate)	NIOSH REL
Amorphous fumed silica	112945-52-5	TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m3 / %SiO2 (Silica)	OSHA Z-3
		TWA	6 mg/m³ (Silica)	NIOSH REL
Carbon black	1333-86-4	TWA	3.5 mg/m³	NIOSH REL
		TWA	3.5 mg/m³	OSHA Z-1
		TWA (Inhalable fraction)	3 mg/m³	ACGIH
Quartz	14808-60-7	TWA (respirable)	10 mg/m3 / %SiO2+2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO2+5	OSHA Z-3
		TWA (Respirable fraction)	0.025 mg/m³ (Silica)	ACGIH
		TWA (Respirable dust)	0.05 mg/m³ (Silica)	NIOSH REL
		TWA (Respirable dust)	0.05 mg/m³	OSHA Z-1
Methanol	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m³	NIOSH REL
		ST	250 ppm 325 mg/m³	NIOSH REL
		TWA	200 ppm 260 mg/m³	OSHA Z-1

These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Calcium carbonate treated with stearic acid

Amorphous fumed silica

Carbon black

Quartz

Biological occupational exposure limits

Ingredients	CAS-No.	Control parameters	Biological specimen	Sam-pling time	Permissible concentra-tion	Basis
Methanol	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI

Engineering measures : Processing may form hazardous compounds (see section 10).
Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Material : Chemical-resistant gloves

Remarks : For prolonged or repeated contact use protective gloves. Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety glasses

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Skin contact must be avoided by using impervious protective

clothing (gloves, aprons, boots, etc).

Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	paste
Color	:	black
Odor	:	slight
Odor Threshold	:	No data available
pH	:	Not applicable
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	Not applicable
Flash point	:	91 °C Method: Seta closed cup
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not classified as a flammability hazard
Self-ignition	:	The substance or mixture is not classified as pyrophoric. The substance or mixture is not classified as self heating.
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	Not applicable
Relative vapor density	:	No data available
Relative density	:	1.52
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-	:	No data available

octanol/water

Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Vapors may form explosive mixture with air. Use at elevated temperatures may form highly hazardous compounds. Can react with strong oxidizing agents. Methyl alcohol is formed upon contact with water or humid air. Hazardous decomposition products will be formed at elevated temperatures.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents

Hazardous decomposition products

Thermal decomposition	:	Benzene Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg

Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 200 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Ingredients:

Amorphous fumed silica:

Acute oral toxicity : LD50 (Rat): > 20,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Information taken from reference works and the literature.

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Based on data from similar materials
Information taken from reference works and the literature.

Carbon black:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 0.0046 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit): > 3,000 mg/kg

Quartz:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Methanol:

Acute oral toxicity : Acute toxicity estimate (Humans): 300 mg/kg
Method: Expert judgment

Acute inhalation toxicity : Acute toxicity estimate: 3 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Expert judgment
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

Acute dermal toxicity : Acute toxicity estimate (Humans): 300 mg/kg
Method: Expert judgment

Skin corrosion/irritation

Not classified based on available information.

Ingredients:

Amorphous fumed silica:

Species: Rabbit
Result: No skin irritation
Remarks: Based on data from similar materials
Information taken from reference works and the literature.

Carbon black:

Species: Rabbit
Result: No skin irritation

Methanol:

Species: Rabbit
Result: No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Ingredients:

Amorphous fumed silica:

Species: Rabbit
Result: No eye irritation
Remarks: Based on data from similar materials
Information taken from reference works and the literature.

Carbon black:

Species: Rabbit
Result: No eye irritation

Methanol:

Species: Rabbit
Result: No eye irritation

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Ingredients:

Carbon black:

Test Type: Buehler Test
Routes of exposure: Skin contact

Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Methanol:

Test Type: Maximization Test
Routes of exposure: Skin contact
Species: Guinea pig
Result: negative

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

Carbon black:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative

Methanol:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Test Type: In vitro mammalian cell gene mutation test Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Result: negative

Carcinogenicity

Not classified based on available information.

Ingredients:

Quartz:

Species: Humans
Application Route: inhalation (dust/mist/fume)
Result: positive
Remarks: IARC: (International Agency for Research on Cancer)
These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Carcinogenicity - Assessment	:	Positive evidence from human epidemiological studies (inhalation)

Methanol:

Species: Mouse

Application Route: inhalation (vapor)
Exposure time: 18 Months
Result: negative

IARC	Group 1: Carcinogenic to humans	
	Quartz	14808-60-7
	Group 2B: Possibly carcinogenic to humans	
	Carbon black	1333-86-4
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Known to be human carcinogen	
	Quartz	14808-60-7

Reproductive toxicity

Not classified based on available information.

Ingredients:

Methanol:

Effects on fertility	:	Test Type: Fertility/early embryonic development Species: Mouse Application Route: Ingestion Result: negative
Effects on fetal development	:	Test Type: Embryo-fetal development Species: Mouse Application Route: Ingestion Result: positive Remarks: The effects were seen only at maternally toxic doses.

STOT-single exposure

Not classified based on available information.

Ingredients:

Methanol:

Target Organs: Eyes, Central nervous system
Assessment: Causes damage to organs.

STOT-repeated exposure

Not classified based on available information.

Ingredients:

Carbon black:

Routes of exposure: inhalation (dust/mist/fume)

Assessment: No significant health effects observed in animals at concentrations of 0.2 mg/l/6h/d or less.

Quartz:

Routes of exposure: inhalation (dust/mist/fume)
Target Organs: Lungs
Assessment: Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Repeated dose toxicity

Ingredients:

Carbon black:

Species: Rat
NOAEL: 1 mg/m³
LOAEL: 7 mg/m³
Application Route: Inhalation
Test atmosphere: dust/mist
Exposure time: 90 Days
Remarks: These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Quartz:

Species: Humans
LOAEL: 0.053 mg/m³
Application Route: Inhalation
Remarks: These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Methanol:

Species: Rat
NOAEL: 1.06 mg/l
Application Route: inhalation (vapor)
Exposure time: 90 Days

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ingredients:

Carbon black:

Toxicity to fish	:	LC0 (Danio rerio (zebra fish)): 1,000 mg/l Exposure time: 96 h Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 5,600 mg/l Exposure time: 24 h Method: OECD Test Guideline 202
Toxicity to algae	:	NOEC (Desmodesmus subspicatus (green algae)): 10,000 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Quartz:

Ecotoxicology Assessment

Acute aquatic toxicity	:	No toxicity at the limit of solubility.
Chronic aquatic toxicity	:	No toxicity at the limit of solubility.

Methanol:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 15,400 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 48 h
Toxicity to algae	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 22,000 mg/l Exposure time: 96 h Method: OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)	:	NOEC (Oryzias latipes (Orange-red killifish)): 15,800 mg/l Exposure time: 200 h
Toxicity to microorganisms	:	IC50: > 1,000 mg/l Exposure time: 3 h

Persistence and degradability

Ingredients:

Methanol:

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 95 % Exposure time: 20 d

Bioaccumulative potential

Ingredients:

Methanol:

Bioaccumulation	:	Species: Leuciscus idus (Golden orfe) Bioconcentration factor (BCF): < 10
Partition coefficient: n-	:	log Pow: -0.77

octanol/water

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Resource Conservation and Recovery Act (RCRA)	:	This product has been evaluated for RCRA characteristics and does not meet the criteria of hazardous waste if discarded in its purchased form.
Waste from residues	:	Dispose of in accordance with local regulations.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Methanol	67-56-1	5000	*
Toluene	108-88-3	1000	*
Ethylenediamine	107-15-3	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Ethylenediamine	107-15-3	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Calcium carbonate treated with stearic acid	Not Assigned
Dimethyl siloxane, hydroxy-terminated	70131-67-8
Dimethyl siloxane, trimethylsiloxy-terminated	63148-62-9
Amorphous fumed silica	112945-52-5
Methanol	67-56-1
Toluene	108-88-3

California Prop. 65

WARNING: This product can expose you to chemicals including Methanol, Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California Permissible Exposure Limits for Chemical Contaminants

Calcium carbonate treated with stearic acid	Not Assigned
Amorphous fumed silica	112945-52-5

California Regulated Carcinogens

Quartz	14808-60-7

The ingredients of this product are reported in the following inventories:

NZIoC : All ingredients listed or exempt.

AICS : All ingredients listed or exempt.

IECSC : All ingredients listed or exempt.

ENCS/ISHL : All components are listed on ENCS/ISHL or exempted from inventory listing.

PICCS : All ingredients listed or exempt.

DSL : All chemical substances in this product comply with the CEPA 1999 and NSNR and are on or exempt from listing on the Canadian Domestic Substances List (DSL).

REACH : For purchases from Dow Corning EU legal entities, all

ingredients are currently pre/registered or exempt under REACH. Please refer to section 1 for recommended uses. For purchases from non-EU Dow Corning legal entities with the intention to export into EEA please contact your DC representative/local office.

TSCA : All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.

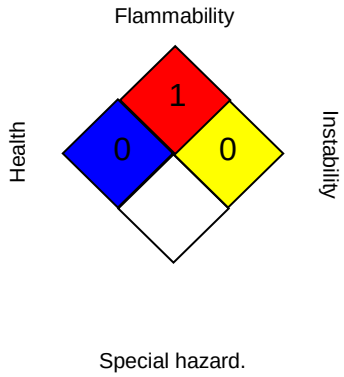
KECI : All ingredients listed, exempt or notified.

TCSI : All ingredients listed or exempt.

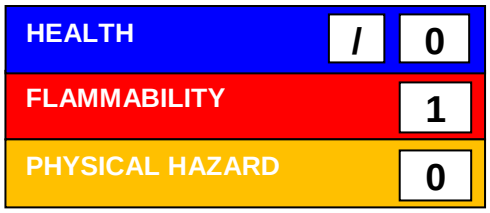
SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	09/14/2017

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8

DOW CORNING

DOW CORNING CORPORATION
Material Safety Data Sheet

Version: 4.0
Revision Date: 2014/06/18

DOW CORNING(R) 799 SILICONE GLASS AND METAL BUILDING SEALANT CLEAR

1. PRODUCT AND COMPANY IDENTIFICATION

Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900
Customer Service: (989) 496-6000
Product Disposal Information: (989) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 04098500
Revision Date: 2014/06/18

Generic Description: Silicone elastomer
Physical Form: Paste
Color: Colorless
Odor: Some odor

NFPA Profile: Health 2 Flammability 2 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause moderate irritation.

Skin: No significant irritation expected from a single short-term exposure.

Inhalation: No significant effects expected from a single short-term exposure.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: Repeated skin contact may cause allergic skin reaction.

Inhalation**:** No known applicable information.

Oral: Overexposure by ingestion may injure the following organ(s): Blood.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Wt %	Component Name
22984-54-9	3.0 - 7.0	Methyltri(ethylmethylketoxime)silane

The above components are hazardous as defined in 29 CFR 1910.1200.

4. FIRST AID MEASURES

Eye: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 - 20 minutes while holding the eyelid(s) open. If contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately obtain medical attention.

Skin: As quickly as possible remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Immediately flush with lukewarm gently flowing water for 15 minutes. Completely decontaminate clothing, shoes and leather goods before reuse or discard. If irritation persists, obtain medical advice.

Inhalation: If symptoms are experienced remove source of contamination or move victim to fresh air. If irritation persists, obtain medical advice.

Oral: If irritation or discomfort occur, obtain medical advice.

Notes to Physician: Treat according to person's condition and specifics of exposure.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable.

Autoignition Temperature: Not determined.

Flammability Limits in Air: Not determined.

Extinguishing Media: On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.

Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up:	Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state and federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which federal, state and local laws and regulations are applicable. Sections 13 and 15 of this MSDS provide information regarding certain federal and state requirements.

Note: See Section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves methyl ethyl ketoxime (MEKO) when exposed to water or humid air. Provide ventilation during use to control methyl ethyl ketoxime (MEKO) within exposure guidelines or use respiratory protection. Avoid eye contact. Avoid skin contact. Do not take internally.

Use reasonable care and store away from oxidizing materials. Keep container closed and store away from water or moisture. This material in its finely divided form presents an explosion hazard. Follow NFPA 654 (for chemical dusts) or 484 (for metal dusts) as appropriate for managing dust hazards to minimize secondary explosion potential.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

CAS Number	Component Name	Exposure Limits
22984-54-9	Methyltri(ethylmethylketoxime)silane	See ethyl methyl ketoxime comments.

Ethyl methyl ketoxime is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within the following exposure guidelines: Vendor guide TWA: 3 ppm, STEL: 10 ppm; AIHA WEEL TWA: 10 ppm.

Engineering Controls

Local Ventilation:	None should be needed.
General Ventilation:	Recommended.

Personal Protective Equipment for Routine Handling

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Wash at mealtime and end of shift. If skin contact occurs, change contaminated clothing as soon as possible and thoroughly flush affected areas with cool water. Chemical protective gloves are recommended.
Suitable Gloves:	Avoid skin contact by implementing good industrial hygiene practices and procedures. Select and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.
Inhalation:	No respiratory protection should be needed.
Suitable Respirator:	None should be needed.

Personal Protective Equipment for Spills

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Wash at mealtime and end of shift. If skin contact occurs, change contaminated clothing as soon as possible and thoroughly flush affected areas with cool water. Chemical protective gloves are recommended.
Inhalation/Suitable Respirator:	No respiratory protection should be needed.
Precautionary Measures:	Avoid eye contact. Avoid skin contact. Do not take internally. Use reasonable care.
Comments:	Product evolves methyl ethyl ketoxime (MEKO) when exposed to water or humid air. Provide ventilation during use to control methyl ethyl ketoxime (MEKO) within exposure guidelines or use respiratory protection.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Paste
Color:	Colorless
Odor:	Some odor

Specific Gravity @ 25°C:	1.04
Viscosity:	Not determined.
Freezing/Melting Point:	Not determined.
Boiling Point:	Not determined.
Vapor Pressure @ 25°C:	Not determined.
Vapor Density:	Not determined.
Solubility in Water:	Not determined.
pH:	Not determined.
Volatile Content:	Not determined.
Flash Point:	Not applicable.
Autoignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.

Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde. Nitrogen oxides. Metal oxides.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

During use of the material, small amounts of methylethylketoxime (MEKO) will be released. Long-term or repeated exposure to high concentrations of oxime-silanes may cause narcotic type effects on the nervous system, harmful effects on the blood (anemia) and irritate nasal passages, but these effects are reversible and not considered serious. Rodents exposed to chronic MEKO inhalation throughout their lifetimes showed significant increases in liver tumor rates.

Special Hazard Information on Components

Sensitizers

CAS Number	Wt %	Component Name	
22984-54-9	3.0 - 7.0	Methyltri(ethylmethylketoxime)silane	Possible skin sensitizer.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class (40 CFR 261)

When a decision is made to discard this material, as received, is it classified as a hazardous waste? No

State or local laws may impose additional regulatory requirements regarding disposal. Call (989) 496-6315, if additional information is required.

14. TRANSPORT INFORMATION

DOT Road Shipment Information (49 CFR 172.101)

Not subject to DOT.

Ocean Shipment (IMDG)

Not subject to IMDG code.

Air Shipment (IATA)

Not subject to IATA regulations.

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

EPA SARA Title III Chemical Listings

Section 302 Extremely Hazardous Substances (40 CFR 355):
None.

Section 304 CERCLA Hazardous Substances (40 CFR 302):
None.

Section 311/312 Hazard Class (40 CFR 370):

Acute:	Yes
Chronic:	Yes
Fire:	Yes
Pressure:	No
Reactive:	No

Section 313 Toxic Chemicals (40 CFR 372):
None present or none present in regulated quantities.

Note: Chemicals are listed under the 313 Toxic Chemicals section only if they meet or exceed a reporting threshold.

Supplemental State Compliance Information

California

Warning: This product contains the following chemical(s) listed by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as being known to cause cancer, birth defects or other reproductive harm.

None known.

New Jersey

CAS Number	Wt %	Component Name
70131-67-8	70.0 - 90.0	Dimethyl siloxane, hydroxy-terminated
7631-86-9	10.0 - 30.0	Silicon dioxide
22984-54-9	3.0 - 7.0	Methyltri(ethylmethylketoxime)silane

Pennsylvania

CAS Number	Wt %	Component Name
70131-67-8	70.0 - 90.0	Dimethyl siloxane, hydroxy-terminated
7631-86-9	10.0 - 30.0	Silicon dioxide
22984-54-9	3.0 - 7.0	Methyltri(ethylmethylketoxime)silane

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

(R) indicates Registered Trademark

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950
US GHS

Synonyms: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquid - Category 2
Skin Corrosion/Irritation - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statements

Highly flammable liquid and vapour.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapours/spray.
Use only outdoors or in well-ventilated area.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

Storage

Store in a well-ventilated place.
Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

110-54-3	Hexane	0.5-4

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

USE ONLY AS A MOTOR FUEL.
DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA
500 ppm STEL

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL
NIOSH: 100 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL

Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 800 ppm TWA; 1900 mg/m3 TWA
NIOSH: 800 ppm TWA; 1900 mg/m3 TWA

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m3 TWA

Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL
OSHA: 1000 ppm TWA; 1900 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1900 mg/m3 TWA

Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m3 TWA
NIOSH: 50 ppm TWA; 180 mg/m3 TWA

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Translucent, straw-colored or light yellow	**Odor:**	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	**Vapor Density:**	AP 3-4
Boiling Point:	85-437 °F (39-200 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible to Slight	**Specific Gravity:**	0.70-0.78
Evaporation Rate:	10-11	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	-45 °F (-43 °C)	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.6%	**Lower Flammability Limit (LFL):**	1.4%
Burning Rate:	ND	**Auto Ignition:**	>530°F (>280°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

Xylenes (o-, m-, p- isomers) (1330-20-7)
Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)
Inhalation LC50 Rat 18 g/m3 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Ethyl alcohol (64-17-5)
Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

Ethylbenzene (100-41-4)
Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)
Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hexane (110-54-3)
Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Moderate irritant. Contact with liquid or vapor may cause irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product may cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

B: Component Carcinogenicity

Gasoline, motor fuel (86290-81-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Ethyl alcohol (64-17-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Gasoline, motor fuel (86290-81-5)

Test & Species		Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]	
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L	
24 Hr EC50 Daphnia magna	170 mg/L	

Toluene (108-88-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]	

96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi-static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene, 1,2,4-trimethyl- (95-63-6)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

Ethyl alcohol (64-17-5)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi-static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

Hexane (110-54-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

DOT Information

Shipping Name: Gasoline
UN #: 1203 **Hazard Class:** 3 **Packing Group:** II
Placard:



* * * Section 15 - Regulatory Information * * *

Regulatory Information

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Toluene (108-88-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (o-, m-, p- isomers) (1330-20-7)
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene, 1,2,4-trimethyl- (95-63-6)
SARA 313: 1.0 % de minimis concentration

Ethylbenzene (100-41-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)
SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	**CAS**	**CA**	**MA**	**MN**	**NJ**	**PA**	**RI**
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

Additional Regulatory Information

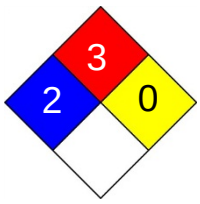
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	3
Reactivity	0



HMIS® Hazard Rating

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Safety Data Sheet - Gorilla Super Glue

Date Revised: 08/09/2015
Date Issued: 05/22/2015
Version: 1.1

FOR CHEMICAL EMERGENCY:
During Business Hours: (800) 966-3458 | Outside Business Hours: (800) 420-7186

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Mixture

Product Name: Gorilla Super Glue

Synonyms: Ethyl Cyanoacrylate Adhesive

Intended Use of the Product

Adhesive for metal, wood, ceramics, leather, paper, most plastics and more

Name, Address, and Telephone of the Responsible Party

Company

The Gorilla Glue Company
4550 Red Bank Expressway
Cincinnati, Ohio 45227
513-271-3300
www.gorillatough.com

Emergency Telephone Number

Emergency number : 1-800-420-7186 (Prosar)

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

Flam. Liq. 4 H227
Skin Irrit. 2 H315
Eye Irrit. 2A H319
STOT SE 3 H335

Full text of H-phrases: see section 16

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS07

Signal Word (GHS-US) : Warning

Hazard Statements (GHS-US) :
H227 - Combustible liquid.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.

Precautionary Statements (GHS-US) :
P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
P261 - Avoid breathing vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves, protective clothing, and eye protection.
P302+P352 - If on skin: Wash with plenty of water.
P304+P340 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312 - Call a poison center or doctor if you feel unwell.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P362 - Take off contaminated clothing and wash before reuse.
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
P233 - Keep container tightly closed.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Other Hazards

Other Hazards Not Contributing to the Classification: Rapid polymerization occurs upon contact with water or alkaline substances. As a result, heat is generated. Skin inflammation or burns may occur upon contact during this polymerization. Contains Cyanoacrylate. Danger. Bonds skin and eyes in seconds. Keep out of the reach of children.

Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ethyl cyanoacrylate	(CAS No) 7085-85-0	86 - 100	Flam. Liq. 4, H227 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

Inhalation: If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

Skin Contact: Remove contaminated clothing. Gently wash with plenty of soap and water followed by rinsing with water for at least 15 minutes. Call a POISON CENTER or doctor/physician if you feel unwell. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms and Effects Both Acute and Delayed

General: Irritation to eyes, skin and respiratory tract.

Inhalation: May cause respiratory irritation.

Skin Contact: Causes skin irritation.

Eye Contact: Causes serious eye irritation.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: Bonds skin and eyes in seconds.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO_2).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: Rapid polymerization occurs upon contact with water or alkaline substances. As a result, heat is generated. Skin inflammation or burns may occur upon contact during this polymerization. May react with strong oxidizers, increasing risk of fire or explosion.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from fire fighting to enter drains or water courses.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Irritating organic vapors may be formed.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Absorb and/or contain spill with inert material, then place in suitable container. Take up in non-combustible materials.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Use only non-sparking tools.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Store away from heat and incompatible materials. Protect from moisture.

Incompatible Materials: Strong acids, strong bases, strong oxidizers. Water.

Storage Temperature: 5 - 25 °C (41 - 77 °F)

Specific End Use(s) Adhesive for metal, wood, ceramics, leather, paper, most plastics and more.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Ethyl cyanoacrylate (7085-85-0)		
USA ACGIH	ACGIH TWA (ppm)	0.2 ppm
Alberta	OEL TWA (mg/m³)	1 mg/m³
Alberta	OEL TWA (ppm)	0.2 ppm
British Columbia	OEL TWA (ppm)	0.2 ppm
Manitoba	OEL TWA (ppm)	0.2 ppm
Newfoundland & Labrador	OEL TWA (ppm)	0.2 ppm
Nova Scotia	OEL TWA (ppm)	0.2 ppm
Ontario	OEL TWA (ppm)	0.2 ppm
Prince Edward Island	OEL TWA (ppm)	0.2 ppm
Saskatchewan	OEL STEL (ppm)	0.6 ppm
Saskatchewan	OEL TWA (ppm)	0.2 ppm

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide sufficient ventilation to keep vapors below permissible exposure limit. Ensure all national/local regulations are observed.

Personal Protective Equipment: Protective clothing. Safety glasses. Gloves. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical goggles or safety glasses.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	White Water / Straw colored
Odor	:	Sharp, irritating
Odor Threshold	:	Not available
pH	:	Not applicable
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	> 100 °C (212 °F)
Flash Point	:	> 81 °C (177.8 °F)
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	< 0.5 mm Hg
Relative Vapor Density at 20 °C	:	Not available

Relative Density	:	1.1 (water = 1)
Specific Gravity	:	1.1
Solubility	:	Immiscible in water.
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.
VOC Content	:	< 20 g/l estimated (California SCAQMD Method 316B)

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Rapid polymerization occurs upon contact with water or alkaline substances. As a result, heat is generated. Skin inflammation or burns may occur upon contact during this polymerization. May react with strong oxidizers, increasing risk of fire or explosion.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures.

Incompatible Materials: Strong acids, strong bases, strong oxidizers. Water.

Hazardous Decomposition Products: Carbon Oxides (CO and CO_2) and other irritating compounds.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Causes skin irritation.

pH: Not applicable

Serious Eye Damage/Irritation: Causes serious eye irritation.

pH: Not applicable

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: Causes skin irritation.

Symptoms/Injuries After Eye Contact: Causes serious eye irritation.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data: Estimated Oral LD50: >5000 mg/kg; Estimated Dermal LD50: >2000 mg/kg; Estimated Inhalation LC50: Vapors may be irritating.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity Not classified

Persistence and Degradability Not available

Bioaccumulative Potential Not available

Mobility in Soil Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

SECTION 14: TRANSPORT INFORMATION

In Accordance with DOT Not regulated for transport
In Accordance with IMDG Not regulated for transport
In Accordance with IATA Not regulated for transport
In Accordance with TDG Not regulated for transport

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Gorilla Super Glue	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Ethyl cyanoacrylate (7085-85-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

US State Regulations

Gorilla Super Glue
California Prop 65: To the best of our knowledge, this product does not contain any of the listed chemicals, which the State of California has found to cause cancer, birth defects or reproductive harm.
Ethyl cyanoacrylate (7085-85-0)
U.S. - New Jersey - Right to Know Hazardous Substance List

Canadian Regulations

Gorilla Super Glue	
WHMIS Classification	Class B Division 3 - Combustible Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects




Ethyl cyanoacrylate (7085-85-0)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 3 - Combustible Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 08/09/2015
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Liq. 4	Flammable liquids Category 4
Skin Irrit. 2	Skin corrosion/irritation Category 2

STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H227	Combustible liquid
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

Party Responsible for the Preparation of This Document
The Gorilla Glue Company
+1 513-271-3300

The information presented in this Safety Data Sheet was prepared by qualified personnel and to the best of our knowledge is true and accurate. The information and recommendations are furnished for this product with the understanding that the purchaser will independently determine the suitability of the product for this purpose. This data does not constitute a warranty, expressed or implied, statutory or otherwise, nor is it representation for which The Gorilla Glue Company assumes legal responsibility. The data is submitted for the user's information and consideration only. Any use of this product must be determined by the user to be in accordance with applicable federal, state, provincial and local laws and regulations.

North America GHS US 2012 & WHMIS 2 GG

Revision Number: 003.1

Issue date: 05/22/2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite PL400 Subfloor Adhesive**
Product type: Assembly adhesive, solvent
Restriction of Use: None identified
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

IDH number: 1652275

Region: United States
Contact information:
Telephone: +1 (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	
DANGER:	HIGHLY FLAMMABLE LIQUID AND VAPOR. CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
FLAMMABLE LIQUID	2
EYE IRRITATION	2A

PICTOGRAM(S)



Precautionary Statements

Prevention: Keep away from heat, sparks, open flames, hot surfaces - no smoking. Keep container tightly closed. No release into water. Use explosion-proof equipment. Use non-sparking tools. Take action to prevent static discharges. Wash affected area thoroughly after handling. Wear protective gloves, eye protection, and face protection.

Response: If on skin (or hair): Take off immediately all contaminated clothing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. In case of fire: Use foam, dry chemical or carbon dioxide to extinguish.

Storage: Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Limestone	1317-65-3	20 - 30

Kaolin	1332-58-7	10 - 20
Acetone	67-64-1	10 - 20
Resin acids and Rosin acids, esters with pentaerythritol	8050-26-8	1 - 5
Methyl acetate	79-20-9	1 - 5
Titanium dioxide	13463-67-7	0.1 - 1
Quartz (SiO2), <1% respirable	14808-60-7	0.1 - 1

* Exact percentages may vary or are trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation: If inhaled, immediately remove the affected person to fresh air. If breathing is difficult, give oxygen. If symptoms develop and persist, get medical attention.

Skin contact: Immediately wash skin thoroughly with soap and water. If symptoms develop and persist, get medical attention.

Eye contact: In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.

Ingestion: Do not induce vomiting, seek medical advice immediately.

Symptoms: See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media: Foam, dry chemical or carbon dioxide. In case of fire, keep containers cool with water spray.

Special firefighting procedures: Wear a self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode. Wear full protective clothing.

Unusual fire or explosion hazards: Closed containers may explode when exposed to extreme heat. Vapors may form explosive mixtures with air. Vapors are heavier than air and may travel along floor to an ignition source.

Hazardous combustion products: Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Eliminate all sources of ignition or flammables that may come into contact with a spill of this material. Ventilate area. Prevent further leakage or spillage if safe to do so. Wear appropriate protective equipment and clothing during clean-up. Do not allow product to enter sewer or waterways.

Clean-up methods: Use noncombustible absorbent material such as sand. Use non-sparking tools for clean-up. Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of according to Federal, State and local governmental regulations.

7. HANDLING AND STORAGE

Handling:

Do not pressurize, cut, heat or weld containers. Empty product containers may contain product residue. Do not reuse empty containers. Use only in well-ventilated areas. Keep out of the reach of children. Keep away from heat, spark and flame. Containers should be grounded and bonded to the receiving container.

Storage:

For safe storage, store between -20 °C (-4°F) and 50 °C (122°F)
Keep away from heat, spark and flame. Keep containers closed when not in use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Limestone	10 mg/m3 TWA Total dust.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust.	None	None
Kaolin	2 mg/m3 TWA Respirable fraction.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust. 15 MPPCF TWA Respirable fraction. 50 MPPCF TWA Total dust. 5 mg/m3 TWA Respirable fraction. 15 mg/m3 TWA Total dust.	None	None
Acetone	250 ppm TWA 500 ppm STEL	1,000 ppm (2,400 mg/m3) PEL	None	None
Resin acids and Rosin acids, esters with pentaerythritol	None	None	None	None
Methyl acetate	200 ppm TWA 250 ppm STEL	200 ppm (610 mg/m3) PEL	None	None
Titanium dioxide	10 mg/m3 TWA	15 mg/m3 PEL Total dust. 15 MPPCF TWA Respirable fraction. 15 mg/m3 TWA Total dust. 50 MPPCF TWA Total dust. 5 mg/m3 TWA Respirable fraction.	None	None
Quartz (SiO2), <1% respirable	0.025 mg/m3 TWA Respirable fraction.	2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.05 mg/m3 TWA (Respirable dust.) (Respirable dust.) 0.025 mg/m3 OSHA_ACT (Respirable dust.) 0.05 mg/m3 PEL Respirable dust.	None	None

Engineering controls: Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

Respiratory protection: Use a NIOSH approved air-purifying respirator if the potential to exceed established exposure limits exists. When workplace hazards warrant the use of a respirator, appropriate respirators must be used, and a program that follows 29 CFR 1910.134 must be followed.

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Chemical resistant, impermeable gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Beige
Odor:	Acetone-like
Odor threshold:	Not available.
pH:	7
Vapor pressure:	Not available.
Boiling point/range:	56 - 57 °C (132.8 - 134.6 °F)
Melting point/ range:	< 0 °C (< 32°F)
Specific gravity:	1.44
Vapor density:	2.0
Flash point:	-17 °C (1.4 °F)
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Flammability:	Not applicable
Evaporation rate:	14.4
Solubility in water:	Slightly soluble
Partition coefficient (n-octanol/water):	Not available.
VOC content:	0.22 %; 5.67 g/l (by weight, calculated using CARB method; g/L less water, less exempts calculated using SCAQMD method)
Viscosity:	375,000 mPa.s
Decomposition temperature:	Not available.

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of storage and use.
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	Carbon dioxide, carbon monoxide and irritating and/or toxic gases and particulate may be generated by thermal decomposition or combustion.
Incompatible materials:	Strong oxidizing agents.
Reactivity:	Not available.
Conditions to avoid:	Heat, flames, sparks and other sources of ignition.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure:	Inhalation, Skin contact

Potential Health Effects/Symptoms

Inhalation: Irritates the nose, throat and respiratory system. Exposure to high doses may cause central nervous system depression. Such doses may also cause adverse effects in the liver, kidneys, and lungs. Abrasion of cured material such as by sanding or grinding could release respirable particles of silica quartz, a cancer hazard by inhalation. Normal use of this product causes no such release. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Skin contact: Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

Eye contact: Contact with eyes can cause eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Ingestion: Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Limestone	None	Nuisance dust
Kaolin	Oral LD50 (Rat) = > 5,000 mg/kg Dermal LD50 (Rat) = > 5,000 mg/kg	Nuisance dust
Acetone	Oral LD50 (Mouse) = 5.2 g/kg Oral LD50 (Mouse) = 3,000 mg/kg Oral LD50 (Rabbit) = 5,340 mg/kg Oral LD50 (Rat) = 5,800 mg/kg Oral LD50 (Rat) = 9,800 mg/kg Dermal LD50 (Rabbit) = 20,000 mg/kg Inhalation LC50 (Rat, 4 h) = 76 mg/l	Central nervous system, Irritant
Resin acids and Rosin acids, esters with pentaerythritol	None	Irritant
Methyl acetate	Oral LD50 (Rabbit) = 3.7 g/kg	Blood, Central nervous system, Eyes, Irritant
Titanium dioxide	None	Irritant, Respiratory, Some evidence of carcinogenicity
Quartz (SiO2), <1% respirable	None	Immune system, Lung, Some evidence of carcinogenicity

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Limestone	No	No	No
Kaolin	No	No	No
Acetone	No	No	No
Resin acids and Rosin acids, esters with pentaerythritol	No	No	No
Methyl acetate	No	No	No
Titanium dioxide	No	Group 2B	No
Quartz (SiO2), <1% respirable	Known To Be Human Carcinogen.	Group 1	Yes

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose of according to Federal, State and local governmental regulations.

Hazardous waste number: It is the responsibility of the user to determine if an item is hazardous as defined in the Resource Conservation and Recovery Act (RCRA) at the time of disposal. Product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity characteristics of the Toxicity Characteristics Leaching Procedure (TCLP) 40 CFR 261.20-24. If discarded, this product is considered a RCRA ignitable waste, D001.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Adhesives
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

International Air Transportation (ICAO/IATA)

Proper shipping name:	Adhesives
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

Water Transportation (IMO/IMDG)

Proper shipping name:	ADHESIVES
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

TSCA 12 (b) Export Notification: None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis.
CERCLA/SARA Section 311/312: Fire, Immediate Health, Delayed Health
CERCLA/SARA Section 313: None above reporting de minimis.

California Proposition 65: This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: This Safety Data Sheet contains changes from the previous version in Section(s): 2, 3, 16

Prepared by: Product Safety and Regulatory Affairs

Issue date: 05/22/2018

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates ("Henkel") does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel's products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel's products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

Revision Number: 002.0

Issue date: 10/05/2016

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Loctite Power Grab All Purpose Express
Product type: Sealant
Restriction of Use: None identified
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

IDH number: 2031710

Region: United States
Contact information:
Telephone: +1 (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: CAUSES SKIN IRRITATION.
CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
EYE IRRITATION	2A

PICTOGRAM(S)



Precautionary Statements

Prevention: Wash affected area thoroughly after handling. Wear protective gloves, eye protection, and face protection.
Response: IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation occurs: Get medical attention. If eye irritation persists: Get medical attention. Take off contaminated clothing.
Storage: Not prescribed
Disposal: Not prescribed

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Limestone	1317-65-3	30 - 60
Quartz (SiO2)	14808-60-7	0.1 - 1

* Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation:	Move to fresh air. If symptoms persist, seek medical advice.
Skin contact:	Wash affected area immediately with soap and water. If symptoms develop and persist, get medical attention.
Eye contact:	In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.
Ingestion:	Rinse out mouth. Do not drink. Never give anything by mouth to an unconscious person. If adverse health effects develop seek medical attention.
Symptoms:	See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media:	Water spray (fog), foam, dry chemical or carbon dioxide.
Special firefighting procedures:	Water may be unsuitable as an extinguishing media, but may be helpful in keeping adjacent containers cool.
Unusual fire or explosion hazards:	This product is an aqueous mixture which will not burn. If evaporated to dryness, the solid residue may pose a slight fire hazard.
Hazardous combustion products:	Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Oxides of nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Ventilate area. Do not allow product to enter sewer or waterways.
Clean-up methods:	Absorb spill with inert material. Shovel material into appropriate container for disposal. Wear appropriate protective equipment and clothing during clean-up. Dispose of according to Federal, State and local governmental regulations.

7. HANDLING AND STORAGE

Handling:	Avoid contact with eyes. Avoid prolonged or repeated skin contact with this material. Use only with adequate ventilation. Wash hands before breaks and immediately after handling the product. Keep out of the reach of children.
Storage:	Keep from freezing.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Limestone	10 mg/m3 TWA Total dust.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust.	None	None
Quartz (SiO2)	0.025 mg/m3 TWA Respirable fraction.	2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.05 mg/m3 PEL	None	None

Engineering controls: Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

Respiratory protection: If ventilation is not sufficient to effectively prevent buildup of aerosols, mists or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	White
Odor:	Acrylic
Odor threshold:	Not available.
pH:	7.3 - 8.5
Vapor pressure:	17.5 mbar (20 °C (68°F)) no method
Boiling point/range:	> 100 °C (> 212°F)
Melting point/ range:	Not available.
Specific gravity:	1.3
Vapor density:	Heavier than air, (Air = 1)
Flash point:	> 93.3 °C (> 199.94 °F) no method
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Flammability:	Not applicable
Evaporation rate:	0.3 (Butyl acetate = 1)
Solubility in water:	Soluble
Partition coefficient (n-octanol/water):	Not available.
VOC content:	0.1 %; 14 g/l (by weight, calculated using CARB method; g/L less water, less exempts calculated using SCAQMD method)
Viscosity:	0 - 1,000,000 cp
Decomposition temperature:	Not available.

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage and use.

Hazardous reactions: Will not occur.

Hazardous decomposition products: Carbon dioxide. Carbon monoxide. Oxides of nitrogen. Hydrocarbons.

Incompatible materials: This product may react with strong acids, bases and oxidizing agents.

Reactivity: Not available.

Conditions to avoid: Freezing conditions.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin, Inhalation

Potential Health Effects/Symptoms

Inhalation: May cause respiratory tract irritation. Abrasion of cured material such as by sanding or grinding could release respirable particles of silica quartz, a cancer hazard by inhalation. Normal use of this product causes no such release.

Skin contact: Prolonged or repeated contact with uncured sealant may cause skin irritation.

Eye contact: Contact with uncured product may irritate the eyes.

Ingestion: Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Limestone	None	Nuisance dust
Quartz (SiO2)	None	Immune system, Lung, Some evidence of carcinogenicity

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Limestone	No	No	No
Quartz (SiO2)	Known To Be Human Carcinogen.	Group 1	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose of according to Federal, State and local governmental regulations.

Hazardous waste number: It is the responsibility of the user to determine if an item is hazardous as defined in the Resource Conservation and Recovery Act (RCRA) at the time of disposal. Product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity characteristics of the Toxicity Characteristics Leaching Procedure (TCLP) 40 CFR 261.20-24.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

TSCA 12 (b) Export Notification: None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis.
CERCLA/SARA Section 311/312: Delayed Health
CERCLA/SARA Section 313: None above reporting de minimis.

California Proposition 65: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: This Safety Data Sheet contains changes from the previous version in Section(s): 2, 11

Prepared by: Mary Ellen Roddy, Sr. Regulatory Affairs Specialist

Issue date: 10/05/2016

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Revision Number: 005.0

Issue date: 01/31/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite Power Grab Ultimate Construction Adhesive**
Product type: Adhesive
Restriction of Use: None identified
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

IDH number: 1989550

Region: United States
Contact information:
Telephone: +1 (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: CAUSES SKIN IRRITATION.
CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
EYE IRRITATION	2A

PICTOGRAM(S)



Precautionary Statements

Prevention: Wash affected area thoroughly after handling. Wear protective gloves, eye protection, and face protection.

Response: IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation occurs: Get medical attention. If eye irritation persists: Get medical attention. Take off contaminated clothing.

Storage: Not prescribed

Disposal: Not prescribed

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Limestone	1317-65-3	60 - 70
Phthalic acid, di(C9-11)alkylester, branched, C10-rich	68515-49-1	10 - 20

Trimethoxyvinylsilane	2768-02-7	1 - 5
Octadecanoic acid	57-11-4	1 - 5
3-(Trimethoxysilyl)propylamine	13822-56-5	0.1 - 1
Quartz (SiO_2) respirable particulates (RCS) >=10%	14808-60-7	0.1 - 1

* Exact percentages may vary or are trade secret. Concentration range is provided to assist users in providing appropriate protections.

Exposure to moisture during cure will release 1-2% methanol.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If symptoms persist, seek medical advice.

Skin contact: Wash with soap and water. If skin irritation persists, call a physician. Wipe off paste with paper towel or cloth.

Eye contact: Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. If symptoms develop and persist, get medical attention.

Ingestion: Do not induce vomiting. If a person feels unwell or symptoms of skin irritation appear, consult a physician.

Symptoms: See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media: carbon dioxide, foam, powder, water spray jet, fine water spray

Special firefighting procedures: Wear protective equipment. Wear self-contained breathing apparatus.

Unusual fire or explosion hazards: None identified.

Hazardous combustion products: Carbon dioxide Carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up. Store in a partly filled, closed container until disposal. Spilled material will solidify. Scrape up as much material as possible. Maintain good ventilation for large spills.

7. HANDLING AND STORAGE

Handling: Do not wear contact lenses. Avoid contact with eyes, skin and clothing. Keep out of the reach of children. Protect from moisture. Use only with adequate ventilation.

Storage: For safe storage, store between 20 °C (68°F) and 45 °C (113°F)
Store in a cool, dry area. Avoid moisture.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Limestone	10 mg/m3 TWA Total dust.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust.	None	None
Phthalic acid, di(C9-11)alkylester, branched, C10-rich	None	None	None	None
Trimethoxyvinylsilane	None	None	None	None
Octadecanoic acid	10 mg/m3 TWA	None	None	None
3-(Trimethoxysilyl)propylamine	None	None	None	None
Quartz (SiO2) respirable particulates (RCS) >=10%	0.025 mg/m3 TWA Respirable fraction.	2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.05 mg/m3 PEL	None	None

Engineering controls: Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Solid
Color:	White to tan
Odor:	alcohol-like
Odor threshold:	Not available.
pH:	Not available.
Vapor pressure:	Not available.
Boiling point/range:	Not available.
Melting point/ range:	Not available.
Specific gravity:	1.70 - 1.72
Vapor density:	Heavier than air.
Flash point:	107 °C (224.6 °F) Seta closed cup
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Flammability:	Not applicable
Evaporation rate:	Not available.
Solubility in water:	Insoluble
Partition coefficient (n-octanol/water):	Not available.
VOC content:	2.73 %; 48.13 g/l (by weight, calculated using CARB method; g/L less water, less exempts calculated using SCAQMD method)
Viscosity:	1,800 - 2,200 mPa.s
Decomposition temperature:	Not available.

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage and use.

Hazardous reactions: Will not occur.

Hazardous decomposition products: Methanol is liberated slowly upon exposure to moisture.

Incompatible materials: Oxidizing agents.

Reactivity: Not available.

Conditions to avoid: Exposure to moisture.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Inhalation, Skin contact, Eye contact

Potential Health Effects/Symptoms

Inhalation: May be harmful if inhaled. Methanol is released during application and cure, which may affect the nervous system causing dizziness, headache or nausea. Abrasion of cured material such as by sanding or grinding could release respirable particles of silica quartz, a cancer hazard by inhalation. Normal use of this product causes no such release.

Skin contact: Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

Eye contact: Vapors may irritate eyes. Contact with eyes will cause irritation.

Ingestion: Harmful if swallowed. Not expected under normal conditions of use.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Limestone	None	Nuisance dust
Phthalic acid, di(C9-11)alkylester, branched, C10-rich	None	Irritant
Trimethoxyvinylsilane	None	Irritant, Allergen
Octadecanoic acid	Oral LD50 (Rat) = 4.6 g/kg	Irritant
3-(Trimethoxysilyl)propylamine	None	Irritant, Allergen
Quartz (SiO2) respirable particulates (RCS) >=10%	None	No Data

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Limestone	No	No	No
Phthalic acid, di(C9-11)alkylester, branched, C10-rich	No	No	No
Trimethoxyvinylsilane	No	No	No
Octadecanoic acid	No	No	No
3-(Trimethoxysilyl)propylamine	No	No	No
Quartz (SiO2) respirable particulates (RCS) >=10%	Known To Be Human Carcinogen.	Group 1	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal:	Follow all local, state, federal and provincial regulations for disposal.
Hazardous waste number:	It is the responsibility of the user to determine if an item is hazardous as defined in the Resource Conservation and Recovery Act (RCRA) at the time of disposal. Product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity characteristics of the Toxicity Characteristics Leaching Procedure (TCLP) 40 CFR 261.20-24.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification:	None above reporting de minimis
CERCLA/SARA Section 302 EHS:	None above reporting de minimis.
CERCLA/SARA Section 311/312:	Delayed Health, Immediate Health
CERCLA/SARA Section 313:	None above reporting de minimis.
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:	Contains one or more components listed on the Non-Domestic Substances List. All other components are listed on or are exempt from listing on the Domestic Substances List. Components listed on the NDSL must be tracked by all Canadian Importers of Record as required by Environment Canada. They may be imported into Canada in limited quantities. Please contact Regulatory Affairs for additional details.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: This Safety Data Sheet contains changes from the previous version in Section(s): 3

Prepared by: Mary Ellen Roddy, Manager, Regulatory Affairs

Issue date: 01/31/2017

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Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

Synonyms: Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

Response
In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

Storage
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Clear, straw-yellow.	**Odor:**	Mild, petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	**Vapor Density:**	>1.0
Boiling Point:	320 to 690 °F (160 to 366 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.83-0.876 @ 60°F (16°C)
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	>125 °F (>52 °C) minimum	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.5	**Lower Flammability Limit (LFL):**	0.6
Burning Rate:	ND	**Auto Ignition:**	494°F (257°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

B: Component Carcinogenicity

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuels, diesel, no. 2 (68476-34-6)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]	

Naphthalene (91-20-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]	
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]	

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information
Shipping Name: Diesel Fuel
NA #: 1993 **Hazard Class:** 3 **Packing Group:** III
Placard:



* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

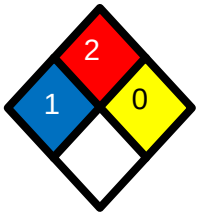
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 Version number 9 Reviewed on 03/16/2015

1 Identification

· **Product identifier**

· **Trade name: Hilti HIT-HY 70**
· **Container size:** 330 ml, 500 ml
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Building and construction work
· **Application of the substance / the mixture** Adhesive mortar for anchor and rebar fastenings

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Hilti, Inc.
5400 South 122nd East Ave.
US-Tulsa, OK 74146
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

· **Information department:** see section 16
· **Emergency telephone number:**
Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)
Hilti, Inc.
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

*

2 Hazard(s) identification

· **Classification of the substance or mixture**

Repr. 1B	H360	May damage fertility or the unborn child.
Aquatic Acute 1	H400	Very toxic to aquatic life.
Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2A	H319	Causes serious eye irritation.
Skin Sens. 1	H317	May cause an allergic skin reaction.
Aquatic Chronic 3	H412	Harmful to aquatic life with long lasting effects.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS07 GHS08 GHS09

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Hydroxypropyl methacrylate
dibenzoyl peroxide
Boric acid
· **Hazard statements**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H360 May damage fertility or the unborn child.
H400 Very toxic to aquatic life.
H412 Harmful to aquatic life with long lasting effects.
· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P262	Do not get in eyes, on skin, or on clothing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	If on skin: Wash with plenty of water.

(Contd. on page 2)

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 **Version number 9** **Reviewed on 03/16/2015**

Trade name: Hilti HIT-HY 70

(Contd. of page 1)

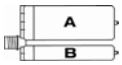
· **Classification system**
· **NFPA ratings (scale 0-4)**



Health = 2
Fire = 1
Reactivity = 1

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

· **Additional information:**



Hilti HIT

· **Information pertaining to particular dangers for man and environment: A**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H360 May damage fertility or the unborn child.
H412 Harmful to aquatic life with long lasting effects.
· **Information pertaining to particular dangers for man and environment: B**
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.
.

*

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:**
2-Component-Foilpack, contains:
Component A: Urethane methacrylate resin, inorganic filler
Component B: Dibenzoylperoxide, phlegmatized

Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:** .

· **Dangerous components A:**		
27813-02-1	Hydroxypropyl methacrylate	5-15%
24448-20-2	(1-methylethylidene)bis(4,1-phenyleneoxy-2,1-ethanediyl) bismethacrylate	5-10%
43048-08-4	Tricyclodecane dimethanol dimethacrylate	2-5%
3290-92-4	Trimethylolpropane trimethacrylate	2-5%
10043-35-3	Boric acid	<1%

.

· **Dangerous components B:**		
94-36-0	dibenzoyl peroxide	5-10%

· **Additional information** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

· **Description of first aid measures**
· **General information** Immediately remove any clothing soiled by the product.
· **After inhalation** Take affected persons into fresh air and keep quiet.
· **After skin contact** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing** Seek immediate medical advice.
· **Information for doctor**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

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Safety Data Sheet
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Trade name: Hilti HIT-HY 70

(Contd. of page 2)

· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents** Water with full jet.
· **Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
In case of fire, the following can be released:
Nitrogen oxides (NOx)
Carbon monoxide (CO)
Carbondioxide (CO2)
· **Advice for firefighters**
· **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Wear protective clothing.
· **Environmental precautions:**
Do not allow to enter sewers/ surface or ground water.
Inform respective authorities in case of seepage into water course or sewage system.
· **Methods and material for containment and cleaning up:**
Clean the affected area carefully; suitable cleaners are:
organic solvent
· **Reference to other sections**
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling**
· **Precautions for safe handling**
Check the expiry date: see imprint on manifold (month/year). Do not use expired mortar!
Keep away from heat and direct sunlight.
The usual precautionary measures for handling chemicals should be followed.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage**
· **Requirements to be met by storerooms and receptacles:**
Keep in a cool, dry and dark place; 41 °F / 5 °C to 77 °F / 25 °C.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:**
Protect from heat and direct sunlight.
Keep receptacle tightly sealed.

· **Storage class**
As per VCI (1991) storage classification concept.
11
11
· **Specific end use(s)** Adhesive mortar for anchor and rebar fastenings

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

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Trade name: Hilti HIT-HY 70

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· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.

3290-92-4 Trimethylolpropane trimethacrylate	
WEEL	Long-term value: 1 mg/m³ Skin

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment**
· **General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Avoid contact with the eyes and skin.
Do not eat, drink, smoke or sniff while working.
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
· **Breathing equipment:** Not required.
· **Protection of hands:**



Protective gloves.

EN 374 / EN 388
Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
· **Material of gloves**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.12 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Not suitable are gloves made of the following materials:**
Leather gloves
Strong gloves
· **Eye protection:**



Tightly sealed goggles.

EN 166 / EN 170
· **Body protection:**



Protective work clothing.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Pasty
Color:	Light grey
· **Odor:**	Ester-like

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Trade name: Hilti HIT-HY 70

(Contd. of page 4)

· **Odour threshold:**	Not determined
· **pH-value:**	Componente A: not applicable Componente B: ~ 6
· **Change in condition**	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	undetermined
· **Flash point:**	> 100 °C (> 212 °F) (DIN EN ISO 1523)
· **Flammability (solid, gaseous)**	Not determined
· **Ignition temperature:**	Not determined
· **Decomposition temperature:**	Component A: not relevant Component B: SADT 65 °C UN test H4
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined
Upper:	Not determined
· **Vapor pressure:**	Not determined
· **Density at 20 °C (68 °F):**	1.7 g/cm³ (14.187 lbs/gal) (DIN 51757)
· **Relative density**	Not determined.
· **Vapour density**	Not determined
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
dynamic at 20 °C (68 °F):	~ 70 Pas (DIN 53019)
kinematic at 20 °C (68 °F):	>20 s (ISO 2431)
· **Solvent content:**	
Water:	Component B: ~ 30%
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
10043-35-3 Boric acid		
Oral	LD50	2660 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:

(Contd. on page 6)

Safety Data Sheet
acc. to ISO 11014

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Trade name: Hilti HIT-HY 70

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Irritant

· **Carcinogenic categories**

· **NTP (National Toxicology Program)**		
14808-60-7	Quartz (SiO2)	K

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**	
3290-92-4 Trimethylolpropane trimethacrylate	
EC50/96h	4.43 mg/l (magna daphnia) 2 mg/l (fish)

· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Harmful to fish
· **Additional ecological information:**
· **According to the formulation contains the following heavy metals and compounds from the EU guideline NO. 2006/11/EC:**
None
· **General notes:**
The product does not contain organically bounded halogens (AOX-free).
Harmful to aquatic organisms
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation**
Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

· **European waste catalogue:**	
08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	paint, inks, adhesives and resins containing dangerous substances

· **Uncleaned packagings:**
· **Recommendation:** Dispose of packaging according to regulations on the disposal of packagings.

14 Transport information

· **UN-Number**	
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **UN proper shipping name**	
· **DOT, ADN, IMDG, IATA**	Void
· **ADR**	Void
· **Transport hazard class(es)**	
· **DOT, ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special marking (ADR):**	None

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Trade name: Hilti HIT-HY 70

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· **Special marking (IATA):**	None
· **Special precautions for user**	Not applicable.
· **Danger code (Kemler):**	Void
· **EMS Number:**	Void
· **Segregation groups**	Void
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not dangerous according to the above specifications. available oxygen content < 1 %
· **UN "Model Regulation":**	-
· **HS-Code:**	3214 10 10: Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Section 355 (Extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

94-36-0	Dibenzoyl peroxide

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65:**

· **Chemicals known to cause cancer:**
None of the ingredients are listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

14808-60-7	Quartz (SiO2)	A2
94-36-0	Dibenzoyl peroxide	A4
10043-35-3	Boric acid	A4

· **MAK (German Maximum Workplace Concentration)**

14808-60-7	Quartz (SiO2)	1

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

14808-60-7	Quartz (SiO2)

· **National regulations**

· **Information about limitation of use:** Employment restrictions concerning young persons must be observed.

· **Other regulations, limitations and prohibitive regulations** None
· **Chemical safety assessment:** not required.

*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
H241 Heating may cause a fire or explosion.
H360 May damage fertility or the unborn child.
- - - -

Safety Data Sheet
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Trade name: Hilti HIT-HY 70

(Contd. of page 7)

R50 Very toxic to aquatic organisms.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R60 May impair fertility.
R61 May cause harm to the unborn child.

· **Department issuing SDS:**
Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
D-86916 Kaufering
Tel.: +49 8191 906310
Fax: +49 8191 90176310
e-mail: anchor.hse@hilti.com
· **Contact:** Mechthild Krauter
· **Date of preparation / last revision** 05/18/2015 / 8
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
Repr. 1B: Reproductive toxicity, Hazard Category 1B
Aquatic Acute 1: Hazardous to the aquatic environment - AcuteHazard, Category 1
Aquatic Chronic 3: Hazardous to the aquatic environment - Chronic Hazard, Category 3
· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 Version number 3 Reviewed on 05/18/2015

1 Identification

· **Product identifier**

· **Trade name: Hilti HIT-HY 200-A**
· **Container size:** 330 ml, 500 ml
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Building and construction work
· **Application of the substance / the mixture** Adhesive anchoring system for rebar and anchor fastenings in concrete.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Hilti, Inc.
5400 South 122nd East Ave.
US-Tulsa, OK 74146
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

· **Information department:**
anchor.hse@hilti.com
see section 16
· **Emergency telephone number:**
Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)

*
2 Hazard(s) identification

· **Classification of the substance or mixture**

Aquatic Acute 1	H400	Very toxic to aquatic life.
Eye Irrit. 2A	H319	Causes serious eye irritation.
Skin Sens. 1	H317	May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS07 GHS09

· **Signal word** Warning

· **Hazard-determining components of labeling:**
Hydroxypropyl methacrylate
dibenzoyl peroxide
· **Hazard statements**
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.
· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P262	Do not get in eyes, on skin, or on clothing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	If on skin: Wash with plenty of water.

· **Classification system**
· **NFPA ratings (scale 0-4)**



Health = 2
Fire = 1
Reactivity = 1

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Safety Data Sheet
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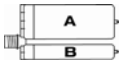
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Trade name: Hilti HIT-HY 200-A

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· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

· **Additional information:**



Hilti HIT

· **Information pertaining to particular dangers for man and environment: A**
H317 May cause an allergic skin reaction.
.
· **Information pertaining to particular dangers for man and environment: B**
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.

*
3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:**
2-Component-Foilpack, contains:
Component A: Urethane methacrylate resin, inorganic filler
Component B: Dibenzoylperoxide, phlegmatized

Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:** .

· **Dangerous components A:**		
27813-02-1	Hydroxypropyl methacrylate	5-10%
2082-81-7	tetramethylene dimethacrylate	10-15%
14808-60-7	Quartz (SiO2)	40-50%
1344-28-1	aluminium oxide	5-10%

.

· **Dangerous components B:**		
94-36-0	dibenzoyl peroxide	10-15%
14808-60-7	Quartz (SiO2)	40-50%
1344-28-1	aluminium oxide	15-25%

.
· **Additional information** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

· **Description of first aid measures**
· **General information** Immediately remove any clothing soiled by the product.
· **After inhalation** Take affected persons into fresh air and keep quiet.
· **After skin contact** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact**
Rinse opened eye for several minutes under running water. Then consult a doctor.
Protect unharmed eye.
· **After swallowing**
Rinse out mouth and then drink plenty of water.
Seek immediate medical advice.
· **Information for doctor**
· **Most important symptoms and effects, both acute and delayed** Allergic reactions
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

(Contd. on page 3)

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 **Version number 3** **Reviewed on 05/18/2015**

Trade name: Hilti HIT-HY 200-A

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5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents** Water with full jet.
· **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Nitrogen oxides (NOx)
Carbon monoxide (CO)
Carbondioxide (CO2)
In certain fire conditions, traces of other toxic gases cannot be excluded.
· **Advice for firefighters**
· **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
· **Environmental precautions:** Do not allow to penetrate the ground/soil.
· **Methods and material for containment and cleaning up:**
Pick up mechanically.
Clean the affected area carefully; suitable cleaners are:
organic solvent
Ensure adequate ventilation.
Dispose contaminated material as waste according to item 13.
· **Reference to other sections**
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling**
· **Precautions for safe handling**
Check the expiry date: see imprint on manifold (month/year). Do not use expired mortar!
The usual precautionary measures for handling chemicals should be followed.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect from heat.

· **Conditions for safe storage, including any incompatibilities**
· **Storage**
· **Requirements to be met by storerooms and receptacles:**
Keep in a cool, dry and dark place; 41 °F / 5 °C to 77 °F / 25 °C.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Protect from heat and direct sunlight.

· **Storage class**
As per VCI (1991) storage classification concept.
11
· **Specific end use(s)** Adhesive mortar for anchor and rebar fastenings

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.
· **Additional information:** The lists that were valid during the creation were used as basis.

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Safety Data Sheet
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Printing date 05/18/2015 **Version number 3** **Reviewed on 05/18/2015**

Trade name: Hilti HIT-HY 200-A

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· **Exposure controls**
· **Personal protective equipment**
· **General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Do not eat, drink, smoke or sniff while working.
· **Breathing equipment:** Not required.
· **Protection of hands:**



Protective gloves.

EN 374
Only use chemical-protective gloves with CE-labeling of category III.
Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
· **Material of gloves**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.12 mm
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Not suitable are gloves made of the following materials:**
Natural rubber, NR
Leather gloves
Strong gloves
· **Eye protection:**



Tightly sealed goggles.

EN 166 / EN 170
· **Body protection:**



Protective work clothing.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pasty
Color:	Component A: grey Component B: white
· **Odor:**	Ester-like
· **Odour threshold:**	Not determined
· **pH-value:**	Componente A: not applicable Componente B: ~ 7
· **Change in condition**	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	undetermined
· **Flash point:**	Component A: > 109 °C (DIN EN ISO 1523) Component B: not applicable
· **Flammability (solid, gaseous)**	Not determined

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Safety Data Sheet
acc. to ISO 11014

Trade name: Hilti HIT-HY 200-A

(Contd. of page 4)

· **Ignition temperature:**	355 °C (671 °F)
· **Decomposition temperature:**	Component A: not relevant Component B: SADT 65 °C UN test H4
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined
Upper:	Not determined
· **Vapor pressure at 20 °C (68 °F):**	< 0.1 hPa (< 0 mm Hg) (HPMA)
· **Density at 20 °C (68 °F):**	1.8 g/cm³ (15.021 lbs/gal) (DIN 51757)
· **Relative density**	Not determined
· **Vapour density**	Not determined
· **Evaporation rate**	Not determined
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix
· **Partition coefficient (n-octanol/water):**	Not determined
· **Viscosity:**	
dynamic at 20 °C (68 °F):	50 Pa.s (DIN EN ISO 53019)
kinematic at 20 °C (68 °F):	> 20 s (ISO 2431)
· **Solvent content:**	
Water:	Component B: ~ 20%
· **Other information**	VOC Content: 7 g/l (EPA Method 24)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
To avoid thermal decomposition do not overheat.
No decomposition if used and stored according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Irritant

· **Carcinogenic categories**

· **NTP (National Toxicology Program)**		
14808-60-7	Quartz (SiO2)	K

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.

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Trade name: Hilti HIT-HY 200-A

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· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **According to the formulation contains the following heavy metals and compounds from the EU guideline NO. 2006/11/EC:**
None
· **General notes:** The product does not contain organically bounded halogens (AOX-free).
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

*
13 Disposal considerations

· **Waste treatment methods**
· **Recommendation**
Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

· **European waste catalogue:**	
08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	paint, inks, adhesives and resins containing dangerous substances

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **UN proper shipping name**	
· **DOT, ADN, IMDG, IATA**	Void
· **ADR**	Void
· **Transport hazard class(es)**	
· **DOT, ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special marking (ADR):**	None
· **Special marking (IATA):**	None
· **Special precautions for user**	Not applicable.
· **Danger code (Kemler):**	Void
· **EMS Number:**	Void
· **Segregation groups**	Void
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not dangerous according to the above specifications. available oxygen content < 1 %
· **UN "Model Regulation":**	-
· **HS-Code:**	3214 10 10: Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics

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Trade name: Hilti HIT-HY 200-A

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Section 355 (Extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

1344-28-1	aluminium oxide
94-36-0	Dibenzoyl peroxide

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65:**

· **Chemicals known to cause cancer:**
None of the ingredients are listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

14808-60-7	Quartz (SiO2)	A2
1344-28-1	aluminium oxide	A4
94-36-0	Dibenzoyl peroxide	A4

· **MAK (German Maximum Workplace Concentration)**

14808-60-7	Quartz (SiO2)	1
1344-28-1	aluminium oxide	2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

14808-60-7	Quartz (SiO2)

· **National regulations**
The product is subject to be labeled according with the prevailing version of the regulations on hazardous substances.

· **Information about limitation of use:** Employment restrictions concerning young persons must be observed.
· **Chemical safety assessment:** not required.

*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R7 May cause fire.
R36 Irritating to eyes.
R43 May cause sensitisation by skin contact.
R50 Very toxic to aquatic organisms.
- - - -

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Trade name: Hilti HIT-HY 200-A

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ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
Aquatic Acute 1: Hazardous to the aquatic environment - AcuteHazard, Category 1
· *** Data compared to the previous version altered.**

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1 Identification

· **Product identifier**

· **Trade name: Hilti HIT-HY 200-R**
· **Container size:** 330 ml, 500 ml
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Building and construction work
· **Application of the substance / the mixture** Adhesive anchoring system for rebar and anchor fastenings in concrete.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Hilti, Inc.
5400 South 122nd East Ave.
US-Tulsa, OK 74146
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

· **Information department:**
anchor.hse@hilti.com
see section 16
· **Emergency telephone number:**
Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)

*
2 Hazard(s) identification

· **Classification of the substance or mixture**

Aquatic Acute 1	H400	Very toxic to aquatic life.
Eye Irrit. 2A	H319	Causes serious eye irritation.
Skin Sens. 1	H317	May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS07 GHS09

· **Signal word** Warning

· **Hazard-determining components of labeling:**
Hydroxypropyl methacrylate
dibenzoyl peroxide
· **Hazard statements**
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.
· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P262	Do not get in eyes, on skin, or on clothing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	If on skin: Wash with plenty of water.

· **Classification system**
· **NFPA ratings (scale 0-4)**



Health = 2
Fire = 1
Reactivity = 1

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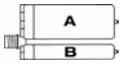
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· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

· **Additional information:**



Hilti HIT

· **Information pertaining to particular dangers for man and environment: A**
H317 May cause an allergic skin reaction.
.
· **Information pertaining to particular dangers for man and environment: B**
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.

*
3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:**
2-Component-Foilpack, contains:
Component A: Urethane methacrylate resin, inorganic filler
Component B: Dibenzoylperoxide, phlegmatized

Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:** .

· **Dangerous components A:**		
27813-02-1	Hydroxypropyl methacrylate	5-10%
2082-81-7	tetramethylene dimethacrylate	10-15%
14808-60-7	Quartz (SiO2)	40-50%
1344-28-1	aluminium oxide	5-10%

.

· **Dangerous components B:**		
94-36-0	dibenzoyl peroxide	10-15%
14808-60-7	Quartz (SiO2)	40-50%
1344-28-1	aluminium oxide	15-25%

4 First-aid measures

· **Description of first aid measures**
· **General information** Immediately remove any clothing soiled by the product.
· **After inhalation** Take affected persons into fresh air and keep quiet.
· **After skin contact** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact**
Rinse opened eye for several minutes under running water. Then consult a doctor.
Protect unharmed eye.
· **After swallowing**
Rinse out mouth and then drink plenty of water.
Seek immediate medical advice.
· **Information for doctor**
· **Most important symptoms and effects, both acute and delayed** Allergic reactions
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

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5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Sand
· **For safety reasons unsuitable extinguishing agents** Water with full jet.
· **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Carbon monoxide (CO)
Carbondioxide (CO2)
Nitrogen oxides (NOx)
In certain fire conditions, traces of other toxic gases cannot be excluded.
· **Advice for firefighters**
· **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective clothing.
Ensure adequate ventilation
· **Environmental precautions:** Do not allow to penetrate the ground/soil.
· **Methods and material for containment and cleaning up:**
Pick up mechanically.
Clean the affected area carefully; suitable cleaners are:
organic solvent
Ensure adequate ventilation.
Dispose contaminated material as waste according to item 13.
· **Reference to other sections**
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

*
7 Handling and storage

· **Handling**
· **Precautions for safe handling**
Check the expiry date: see imprint on manifold (month/year). Do not use expired mortar!
The usual precautionary measures for handling chemicals should be followed.
· **Information about protection against explosions and fires:**
No special measures required.
Keep ignition sources away - Do not smoke.

· **Conditions for safe storage, including any incompatibilities**
· **Storage**
· **Requirements to be met by storerooms and receptacles:**
Keep in a cool, dry and dark place; 41 °F / 5 °C to 77 °F / 25 °C.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Protect from heat and direct sunlight.

· **Storage class**
As per VCI (1991) storage classification concept.
11
· **Specific end use(s)** Adhesive mortar for anchor and rebar fastenings

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.

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Trade name: Hilti HIT-HY 200-R

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· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment**
· **General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Do not eat, drink, smoke or sniff while working.
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Breathing equipment:** Not required.
· **Protection of hands:**



Protective gloves.

Only use chemical-protective gloves with CE-labeling of category III.
EN 374
Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
· **Material of gloves**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.12 mm
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Not suitable are gloves made of the following materials:**
Natural rubber, NR
Leather gloves
Strong gloves
· **Eye protection:**



Tightly sealed goggles.

EN 166 / EN 170
· **Body protection:**



Protective work clothing.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pasty
Color:	Component A: grey Component B: white
· **Odor:**	Ester-like
· **Odour threshold:**	Not determined
· **pH-value:**	Componente A: not applicable Componente B: ~ 7
· **Change in condition**	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	undetermined
· **Flash point:**	Component A: > 109 °C (DIN EN ISO 1523) Component B: not applicable
· **Flammability (solid, gaseous)**	Not determined

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Trade name: Hilti HIT-HY 200-R

(Contd. of page 4)

· **Ignition temperature:**	355 °C (671 °F)
· **Decomposition temperature:**	Component A: not relevant Component B: SADT 65 °C UN test H4
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined
Upper:	Not determined
· **Vapor pressure at 20 °C (68 °F):**	< 0.1 hPa (< 0 mm Hg)
· **Density at 20 °C (68 °F):**	1.8 g/cm³ (15.021 lbs/gal) (DIN 51757)
· **Relative density**	Not determined
· **Vapour density**	Not determined
· **Evaporation rate**	Not determined
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix
· **Partition coefficient (n-octanol/water):**	Not determined
· **Viscosity:**	
dynamic at 20 °C (68 °F):	50 Pa.s (DIN 53019)
kinematic at 20 °C (68 °F):	> 20 s (ISO 2431)
· **Solvent separation test**	Not determined
· **Solvent content:**	
Organic solvents:	None
Water:	Component B: ~ 20%
· **Other information**	VOC Content: 7 g/l (EPA Method 24)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
To avoid thermal decomposition do not overheat.
No decomposition if used and stored according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Irritant

· **Carcinogenic categories**

· **NTP (National Toxicology Program)**		
14808-60-7	Quartz (SiO2)	K

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12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **According to the formulation contains the following heavy metals and compounds from the EU guideline NO. 2006/11/EC:**
None
· **General notes:** The product does not contain organically bounded halogens (AOX-free).
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

*

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation**
Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

· **European waste catalogue:**	
08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	paint, inks, adhesives and resins containing dangerous substances

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **UN proper shipping name**	
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **Transport hazard class(es)**	
· **DOT, ADN**	
· **Class**	Void
· **ADR, IMDG, IATA**	
· **Class**	Void
· **Label**	Void
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special marking (ADR):**	None
· **Special marking (IATA):**	None
· **Special precautions for user**	Not applicable.
· **Danger code (Kemler):**	Void
· **EMS Number:**	Void
· **Segregation groups**	Void
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not dangerous according to the above specifications. available oxygen content < 1 %

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Trade name: Hilti HIT-HY 200-R

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· **UN "Model Regulation":**	-
· **HS-Code:**	3214 10 10: Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Section 355 (Extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

1344-28-1	aluminium oxide
94-36-0	Dibenzoyl peroxide

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65:**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

14808-60-7	Quartz (SiO2)	A2
1344-28-1	aluminium oxide	A4
94-36-0	Dibenzoyl peroxide	A4

· **MAK (German Maximum Workplace Concentration)**

14808-60-7	Quartz (SiO2)	1
1344-28-1	aluminium oxide	2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

14808-60-7	Quartz (SiO2)

· **National regulations**
The product is subject to be labeled according with the prevailing version of the regulations on hazardous substances.

· **Information about limitation of use:** Employment restrictions concerning young persons must be observed.
· **Chemical safety assessment:** not required.

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16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R7 May cause fire.
R36 Irritating to eyes.
R43 May cause sensitisation by skin contact.
R50 Very toxic to aquatic organisms.
- - - -

Safety Data Sheet
acc. to ISO 11014

Trade name: Hilti HIT-HY 200-R

(Contd. of page 7)

Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
D-86916 Kaufering
Tel.: +49 8191 906310
Fax: +49 8191 90176310
e-mail: anchor.hse@hilti.com
None
· **Contact:** Mechthild Krauter
· **Date of preparation / last revision** 05/18/2015 / 2
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
Aquatic Acute 1: Hazardous to the aquatic environment - AcuteHazard, Category 1
· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 | Version number 8 | Reviewed on 05/18/2015

1 Identification

· **Product identifier**

· **Trade name: Hilti HIT-RE 500**
· **Container size:** 330 ml, 500 ml
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** Building and construction work
· **Application of the substance / the mixture** Adhesive mortar for rebar and anchor fastenings in solid concrete

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Hilti, Inc.
5400 South 122nd East Ave.
US-Tulsa, OK 74146
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

· **Information department:**
anchor.hse@hilti.com
see section 16
· **Emergency telephone number:**
Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)
Hilti, Inc.
Phone: (800) 879-8000
Fax: (800) 879-7000
Español: (800) 879-5000

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2 Hazard(s) identification

· **Classification of the substance or mixture**

Skin Corr. 1A	H314	Causes severe skin burns and eye damage.
Eye Dam. 1	H318	Causes serious eye damage.
Aquatic Chronic 2	H411	Toxic to aquatic life with long lasting effects.
Skin Sens. 1	H317	May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS05 GHS07 GHS09

· **Signal word** Danger

· **Hazard-determining components of labeling:**
m-Xylylenediamine
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin
(number average molecular weight = 700)
Reaction product: bisphenol-F epichlorhydrin resin, MW ≤ 700
· **Hazard statements**
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.
· **Precautionary statements**

P260	Do not breathe vapours.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.

(Contd. on page 2)

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 **Version number 8** **Reviewed on 05/18/2015**

Trade name: Hilti HIT-RE 500

(Contd. of page 1)

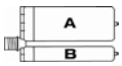
· **Classification system**
· **NFPA ratings (scale 0-4)**



Health = 3
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

· **Additional information:**



Hilti HIT

· **Information pertaining to particular dangers for man and environment: A**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.
· **Information pertaining to particular dangers for man and environment: B**
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

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3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:**
2-component-foilpack, contains:
Component A: Epoxy resin, Reactive diluent, inorganic filler
Component B: Amine hardener, inorganic filler

Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:** .

· **Dangerous components A:**		
25068-38-6	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)	25-50%
28064-14-4	Reaction product: bisphenol-F epichlorhydrin resin, MW ≤ 700	10-25%
16096-31-4	1,6-bis(2,3-epoxypropoxy)hexane	10-25%
30499-70-8	Trimethylolpropane, (chloromethyl)oxirane polymer	2.5-10%
14808-60-7	Quartz (SiO2)	25-50%

.

· **Dangerous components B:**		
1477-55-0	m-Xylylenediamine	30-40%
14808-60-7	Quartz (SiO2)	15-30%
1344-28-1	aluminium oxide	5-10%

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· **Additional information** For the wording of the listed risk phrases refer to section 16.

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4 First-aid measures

· **Description of first aid measures**
· **General information** Immediately remove any clothing soiled by the product.
· **After inhalation**
Take affected persons into fresh air and keep quiet.
Seek medical treatment in case of complaints.
· **After skin contact** Immediately wash with water and soap and rinse thoroughly.

(Contd. on page 3)

Trade name: Hilti HIT-RE 500

(Contd. of page 2)

· **After eye contact**
Seek immediate medical advice.
Rinse opened eye for several minutes under running water. Then consult a doctor.
Protect unharmed eye.
Seek medical treatment.
· **After swallowing**
Do not induce vomiting; immediately call for medical help.
Rinse out mouth and then drink plenty of water.
· **Information for doctor**
· **Most important symptoms and effects, both acute and delayed** Allergic reactions
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents** Water with full jet.
· **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Nitrogen oxides (NOx)
Carbon monoxide (CO)
In certain fire conditions, traces of other toxic gases cannot be excluded.
· **Advice for firefighters**
· **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Wear protective clothing.
Ensure adequate ventilation
· **Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Do not allow to penetrate the ground/soil.
· **Methods and material for containment and cleaning up:**
Pick up mechanically.
Clean the affected area carefully; suitable cleaners are:
organic solvent
Dispose contaminated material as waste according to item 13.
· **Reference to other sections**
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

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7 Handling and storage

· **Handling**
· **Precautions for safe handling**
The usual precautionary measures for handling chemicals should be followed.
Take note of emission threshold.
Use only in well ventilated areas.
Check the expiry date: see imprint on manifold (month/year). Do not use expired mortar!
· **Information about protection against explosions and fires:** Keep ignition sources away - Do not smoke.

· **Conditions for safe storage, including any incompatibilities**
· **Storage**
· **Requirements to be met by storerooms and receptacles:**
Keep in a cool, dry and dark place; 41 °F / 5 °C to 77 °F / 25 °C.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Protect from heat and direct sunlight.

· **Storage class** As per VCI (1991) storage classification concept.

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Trade name: Hilti HIT-RE 500

(Contd. of page 3)

· **Specific end use(s)** Adhesive mortar for rebar and anchor fastenings in solid concrete

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8 Exposure controls/personal protection

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.

1477-55-0 m-Xylylenediamine	
REL	Short-term value: C 0.1 mg/m³ Skin
TLV	Short-term value: C 0.1 mg/m³ Skin

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment**
· **General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Do not eat, drink, smoke or sniff while working.
Clean skin thoroughly immediately after handling the product.
Ensure that washing facilities are available at the work place.
Keep away from foodstuffs, beverages and feed.
Use skin protection cream for skin protection.
Do not carry product impregnated cleaning cloths in trouser pockets.
· **Breathing equipment:**
Not necessary if room is well-ventilated.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· **Recommended filter device for short term use:** Filter AX
· **Protection of hands:**



Protective gloves.

Only use chemical-protective gloves with CE-labeling of category III.
EN 374
Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
· **Material of gloves**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.4 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **As protection from splashes gloves made of the following materials are suitable:** Nitrile rubber, NBR
· **Not suitable are gloves made of the following materials:**
Natural rubber, NR
Leather gloves
Strong gloves
· **Eye protection:**



Tightly sealed goggles.

Gauze goggles
Face protection

(Contd. on page 5)

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Trade name: Hilti HIT-RE 500

(Contd. of page 4)

EN 166 / EN 170
· **Body protection:**



Protective work clothing.

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9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pasty
Color:	Component A: grey Component B: red Mixture: red
· **Odor:**	Amine-like
· **Odour threshold:**	Not determined
· **pH-value:**	Component A: 7 Component B: 11,5 Mixture: 11,5
· **Change in condition**	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	> 200 °C (> 392 °F)
· **Flash point:**	> 100 °C (> 212 °F) (DIN EN ISO 1523)
· **Flammability (solid, gaseous)**	Not determined
· **Ignition temperature:**	Not determined
· **Decomposition temperature:**	Not determined
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined
Upper:	Not determined
· **Vapor pressure at 20 °C (68 °F):**	0.04 hPa
· **Density:**	Component A: 1.5 g/cm³ (DIN 51757) Component B: 1.4 g/cm³ (DIN 51757) Not determined
· **Relative density**	Not determined
· **Vapour density**	Not determined
· **Evaporation rate**	Not determined
· **Solubility in / Miscibility with**	
Water:	Insoluble
· **Partition coefficient (n-octanol/water):**	Not determined
· **Viscosity:**	
dynamic at 20 °C (68 °F):	50 Pas (DIN 53019)
kinematic at 20 °C (68 °F):	>20 s (ISO 2431)
· **Solvent content:**	
Organic solvents:	0 %
Water:	0 %
· **Other information**	No further relevant information available.

(Contd. on page 6)

Safety Data Sheet
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Printing date 05/18/2015 **Version number 8** **Reviewed on 05/18/2015**

Trade name: Hilti HIT-RE 500

(Contd. of page 5)

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known

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11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
1477-55-0 m-Xylylenediamine		
Oral	LD50	1040 mg/kg (rat)
Dermal	LD50	2000 mg/kg (rabbit)
Inhalative	LC50/4h	2.4 mg/l (rat)

· **Primary irritant effect:**
· **on the skin:** Strong caustic effect on skin and mucous membranes.
· **on the eye:**
Strong caustic effect.
Strong irritant with the danger of severe eye injury.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Harmful
Corrosive
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· **Carcinogenic categories**

· **NTP (National Toxicology Program)**		
14808-60-7	Quartz (SiO2)	K

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**	
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)	
EC50/48h	9.4 mg/l (Algae)
	1.7 mg/l (magna daphnia)
EC50/96h	1.2 mg/l (fish)
28064-14-4 Reaction product: bisphenol-F epichlorhydrin resin, MW ≤ 700	
EC50/48h	9.4 mg/l (Algae)
	1.7 mg/l (magna daphnia)
EC50/96h	1.5 mg/l (fish)
16096-31-4 1,6-bis(2,3-epoxypropoxy)hexane	
EC50/48h	23.1 mg/l (Algae)
	39 mg/l (magna daphnia)
EC50/96h	17.1 mg/l (fish)
1477-55-0 m-Xylylenediamine	
EC50/48h	12 mg/l (Algae)

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Trade name: Hilti HIT-RE 500

(Contd. of page 6)

	15.2 mg/l (magna daphnia)
EC50/96h	75 mg/l (fish)

· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Toxic for fish
· **Additional ecological information:**
· **According to the formulation contains the following heavy metals and compounds from the EU guideline NO. 2006/11/EC:**
None
· **General notes:**
Avoid transfer into the environment.
The product contains materials that are harmful to the environment.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

*
13 Disposal considerations

· **Waste treatment methods**
· **Recommendation**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Hand over to hazardous waste disposers.
Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

· **European waste catalogue:**	
08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	paint, inks, adhesives and resins containing dangerous substances

· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Dispose of packaging according to regulations on the disposal of packagings.

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14 Transport information

· **UN-Number**	
· **ADR, IMDG, IATA**	3259 / PG II 3077 / PG III
· **UN proper shipping name**	
· **ADR**	AMINES, SOLID, CORROSIVE, N.O.S. (m-Xylylenediamine) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Bisphenol A/F Epoxy Resin)
· **IMDG, IATA**	AMINES, SOLID, CORROSIVE, N.O.S (m-Xylylenediamine) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (Bisphenol A/F Epoxy Resin)
· **Transport hazard class(es)**	
· **ADR**	
· **Class**	8 Corrosive substances 9 Miscellaneous dangerous substances and articles.
· **IMDG, IATA**	
· **Class**	8 9

(Contd. on page 8)

Safety Data Sheet
acc. to ISO 11014

Printing date 05/18/2015 Version number 8 Reviewed on 05/18/2015

Trade name: Hilti HIT-RE 500

(Contd. of page 7)

· **Label**	8 9
· **Packing group** · **ADR, IMDG, IATA**	 3259 / PG II 3077 / PG III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user** · **EMS Number:**	Not applicable. F-A, S-B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **IMDG** · **Remarks:**	 Limited Quantity (LQ) 1 kg 5 kg
· **IATA** · **Remarks:**	 Packing Instruction No. UN 3259: 859 UN 3077: 956 All packed in one
· **UN "Model Regulation":**	II
· **HS-Code:**	3214 10 10: Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Section 355 (Extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

1344-28-1	aluminium oxide

· **TSCA (Toxic Substances Control Act):**

14808-60-7	Quartz (SiO2)
25068-38-6	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)
28064-14-4	Reaction product: bisphenol-F epichlorhydrin resin, MW ≤ 700
1477-55-0	m-Xylylenediamine
16096-31-4	1,6-bis(2,3-epoxypropoxy)hexane
30499-70-8	Trimethylolpropane, (chloromethyl)oxirane polymer
67762-90-7	FUMED SILICA (SILOXANES AND SILICONES, DI-ME, REACTION PRODUCTS WITH SILICA)
65997-16-2	Cement, alumina, chemicals
1344-28-1	aluminium oxide

· **Proposition 65:**

· **Chemicals known to cause cancer:**

14808-60-7	Quartz (SiO2)

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

14808-60-7	Quartz (SiO2)	A2
1344-28-1	aluminium oxide	A4
108-46-3	resorcinol	A4

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acc. to ISO 11014

Trade name: Hilti HIT-RE 500

(Contd. of page 8)

· **MAK (German Maximum Workplace Concentration)**		
14808-60-7	Quartz (SiO2)	1
1344-28-1	aluminium oxide	2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**	
14808-60-7	Quartz (SiO2)

· **National regulations**
The product is subject to be labeled according with the prevailing version of the regulations on hazardous substances.

· **Information about limitation of use:** Employment restrictions concerning young persons must be observed.
· **Chemical safety assessment:** not required.

*
16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases** H318 Causes serious eye damage.

· **Department issuing SDS:**
Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
D-86916 Kaufering
Tel.: +49 8191 906310
Fax: +49 8191 90176310
e-mail: anchor.hse@hilti.com
· **Contact:** Mechthild Krauter
· **Date of preparation / last revision** 05/18/2015 / 7
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
Aquatic Chronic 2: Hazardous to the aquatic environment - Chronic Hazard, Category 2
· *** Data compared to the previous version altered.**

HIT-RE 500 V3

Safety information for 2-Component-products

Date of issue: 13/11/2015 Revision date: 12/11/2015 Version: 1.0

SECTION 1: Kit identification

1.1 Product identifier

Name HIT-RE 500 V3



Product code BU Anchor

1.2 Details of the supplier of the Safety information for 2-Component-products

Hilti, Inc.
Legacy Tower, Suite 1000
75024 Plano - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

SECTION 2: General information

A SDS for each of these components is included. Please do not separate any component SDS from this cover page.

This Kit should be handled in accordance with good laboratory practices and appropriate personal protective equipment should be used.

SECTION 3: Kit contents

Classification of the Product

GHS-US classification

Skin Corr. 1A	H314
Skin Sens. 1	H317
STOT SE 3	H335
Aquatic Chronic 2	H411

Label elements

GHS-US labelling

Hazard pictograms (GHS-US)



GHS05 GHS07 GHS09

Signal word (GHS-US) Danger

Hazardous ingredients Epoxy resin, Amines

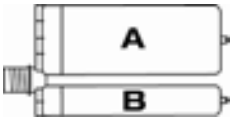
Hazard statements (GHS-US)
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H335 - May cause respiratory irritation
H411 - Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US)
P280 - Wear eye protection, protective clothing, protective gloves
P262 - Do not get in eyes, on skin, or on clothing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention

P302+P352 - IF ON SKIN: Wash with plenty of water

Additional information

2-component-foilpack, contains:
Component A: Epoxy resin, Reactive diluent, inorganic filler
Component B: Amine hardener, inorganic filler



Name	General description	Quantity	Unit	GHS-US classification
HIT-RE 500 V3, A		1	pcs (pieces)	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411
HIT-RE 500 V3, B		1	pcs (pieces)	Skin Corr. 1A, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335 Aquatic Chronic 3, H412

SECTION 4: General advice

General advice	For professional users only

SECTION 5: Safe handling advice

Environmental precautions	Prevent entry to sewers and public waters Notify authorities if liquid enters sewers or public waters Avoid release to the environment
Storage conditions	Protect from sunlight. Store in a well-ventilated place
Technical measures	Comply with applicable regulations
Precautions for safe handling	Wear personal protective equipment Avoid contact with skin and eyes Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work Avoid contact during pregnancy/while nursing
Methods for cleaning up	This material and its container must be disposed of in a safe way, and as per local legislation Recover mechanically the product On land, sweep or shovel into suitable containers Store away from other materials
For containment	Collect spillage
Incompatible materials	Sources of ignition Direct sunlight
Incompatible products	Strong bases Strong acids

SECTION 6: First aid measures

First-aid measures after eye contact	Get immediate medical advice/attention Immediately rinse with water for a prolonged period while holding the eyelids wide open Remove contact lenses, if present and easy to do. Continue rinsing Consult an eye specialist
First-aid measures after ingestion	Drink plenty of water Do not induce vomiting Rinse mouth Immediately call a POISON CENTER or doctor/physician
First-aid measures after inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing

First-aid measures after skin contact	Wash with plenty of soap and water Remove/Take off immediately all contaminated clothing Wash contaminated clothing before reuse If skin irritation or rash occurs: Get immediate medical advice/attention
First-aid measures general	Never give anything by mouth to an unconscious person If you feel unwell, seek medical advice (show the label where possible)
Symptoms/injuries	Causes severe skin burns and eye damage
Symptoms/injuries after eye contact	Causes serious eye damage
Symptoms/injuries after inhalation	May cause an allergic skin reaction

SECTION 7: Fire fighting measures

Firefighting instructions	Use water spray or fog for cooling exposed containers Exercise caution when fighting any chemical fire Prevent fire-fighting water from entering environment
Protection during firefighting	Self-contained breathing apparatus Do not enter fire area without proper protective equipment, including respiratory protection
Hazardous decomposition products in case of fire	Thermal decomposition generates : Carbon dioxide Carbon monoxide

SECTION 8: Other information

No data available

HIT-RE 500 V3, B

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 11/13/2015 Revision date: 11/12/2015 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	Mixture
Name	HIT-RE 500 V3, B
Product code	BU Anchor

1.2. Relevant identified uses of the substance or mixture and uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier
Hilti, Inc.
Legacy Tower, Suite 1000
75024 Plano - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

Department issuing data specification sheet
Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
86916 Kaufering - Deutschland
T +49 8191 906310 - F +49 8191 90176310
anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number

Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)
+1 918 8723000
1-800-879-8000 toll free

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Corr. 1A	H314 -	Causes severe skin burns and eye damage
Skin Sens. 1	H317 -	May cause an allergic skin reaction
STOT SE 3	H335 -	May cause respiratory irritation
Aquatic Chronic 3	H412 -	Harmful to aquatic life with long lasting effects

Full text of H-statements: see section 16

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US)



GHS05 GHS07

Signal word (GHS-US) Danger

Hazard statements (GHS-US)
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H335 - May cause respiratory irritation
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (GHS-US)
P280 - Wear eye protection, protective clothing, protective gloves
P262 - Do not get in eyes, on skin, or on clothing
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS-US classification
2-methyl-1,5-pentanediamine	(CAS No) 15520-10-2	25-40	Flam. Liq. 4, H227 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335
Quartz	(CAS No) 14808-60-7	10 - 25	Carc. 1A, H350
Phenol, styrenated	(CAS No) 61788-44-1	5-10	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317
m-Xylylenediamine	(CAS No) 1477-55-0	5-<8	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Corr. 1B, H314 Skin Sens. 1B, H317 Aquatic Chronic 3, H412
2,4,6-tris(dimethylaminomethyl)phenol	(CAS No) 90-72-2	1-2,5	Skin Corr. 1B, H314 Skin Sens. 1B, H317 Aquatic Chronic 3, H412
3-Aminopropyltriethoxysilan	(CAS No) 919-30-2	1-2,5	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact: Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get immediate medical advice/attention.

First-aid measures after eye contact: Get immediate medical advice/attention. Immediately rinse with water for a prolonged period while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Consult an eye specialist.

First-aid measures after ingestion: Drink plenty of water. Do not induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries: Causes severe skin burns and eye damage.

Symptoms/injuries after inhalation: May cause an allergic skin reaction.

Symptoms/injuries after eye contact: Causes serious eye damage.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media	Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Reactivity	Corrosive vapours.

5.3. Advice for firefighters

Firefighting instructions	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Protection during firefighting	Self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	Use personal protective equipment as required. Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment	Collect spillage.
Methods for cleaning up	This material and its container must be disposed of in a safe way, and as per local legislation. Recover mechanically the product. On land, sweep or shovel into suitable containers. Store away from other materials.
Other information	Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	Wear personal protective equipment. Avoid contact with skin and eyes. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid contact during pregnancy/while nursing.
Hygiene measures	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	Comply with applicable regulations.

Storage conditions	Protect from sunlight. Store in a well-ventilated place.
Incompatible products	Strong bases. Strong acids.
Incompatible materials	Sources of ignition. Direct sunlight.
Storage temperature	5 - 25 °C

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional information	The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.

8.2. Exposure controls

Personal protective equipment: Avoid all unnecessary exposure. Safety glasses. Gloves. Protective clothing.



Hand protection	Wear protective gloves.
Eye protection	Chemical goggles or face shield.
Skin and body protection	Wear suitable protective clothing.
Environmental exposure controls	Avoid release to the environment.
Consumer exposure controls	Avoid contact during pregnancy/while nursing.
Other information	Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste.
Colour	red
Odour	Amine-like
Odour threshold	No data available
pH	11.5
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	No data available
Explosive limits	No data available
Explosive properties	No data available
Oxidising properties	No data available
Vapour pressure	No data available
Relative density	No data available
Relative vapour density at 20 °C	No data available
Density	1.31 g/cm³
Solubility	insoluble in water.

Log Pow	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Viscosity, kinematic	No data available
Viscosity, dynamic	50 - 70 Pa.s HN-0333

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Corrosive vapours.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates : fume. Carbon monoxide. Carbon dioxide. Corrosive vapours.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

2-methyl-1,5-pentanediamine (15520-10-2)	
LD50 oral rat	1690 mg/kg (Rat)
LD50 dermal rat	1870 mg/kg
LC50 inhalation rat (mg/l)	4.9 mg/l
ATE US (oral)	1690.000 mg/kg bodyweight
ATE US (dermal)	1870.000 mg/kg bodyweight
ATE US (gases)	4500.000 ppmv/4h
ATE US (vapours)	4.900 mg/l/4h
ATE US (dust,mist)	4.900 mg/l/4h

Phenol, styrenated (61788-44-1)	
LD50 oral rat	> 2500 mg/kg
LD50 dermal rat	> 2000 mg/kg
LC50 inhalation rat (mg/l)	158.31 mg/l/4h
ATE US (vapours)	158.310 mg/l/4h
ATE US (dust,mist)	158.310 mg/l/4h

m-Xylylenediamine (1477-55-0)	
LD50 oral rat	1090 mg/kg
LD50 dermal rat	> 3100 mg/kg
ATE US (oral)	660.000 mg/kg bodyweight
ATE US (dermal)	2000.000 mg/kg bodyweight
ATE US (dust,mist)	1.340 mg/l/4h

3-Aminopropyltriethoxysilan (919-30-2)	
ATE US (oral)	500.000 mg/kg bodyweight

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
LD50 oral rat	2169 mg/kg (Rat; Equivalent or similar to OECD 401; Literature study; 2169 mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rat	> 2000 mg/kg (Rat; Literature study; Other; >1 ml/kg; Rat; Experimental value)
ATE US (oral)	2169.000 mg/kg bodyweight

Skin corrosion/irritation	Causes severe skin burns and eye damage. pH: 11.5
Serious eye damage/irritation	Not classified pH: 11.5
Respiratory or skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified Based on available data, the classification criteria are not met
Carcinogenicity	Not classified

Quartz (14808-60-7)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity	Not classified Based on available data, the classification criteria are not met
Specific target organ toxicity (single exposure)	May cause respiratory irritation.
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration hazard	Not classified
Potential adverse human health effects and symptoms	Based on available data, the classification criteria are not met.
Symptoms/injuries after inhalation	May cause an allergic skin reaction.
Symptoms/injuries after eye contact	Causes serious eye damage.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water: Harmful to aquatic life with long lasting effects.

2-methyl-1,5-pentanediamine (15520-10-2)	
LC50 fish 1	130 mg/l (LC50; 48 h)
LOEC (acute)	1800 mg/l
NOEC (acute)	1000 mg/l

Phenol, styrenated (61788-44-1)	
LC50 fish 1	5.6 mg/l
LC50 other aquatic organisms 1	9.7 mg/l
EC50 Daphnia 1	1.44 mg/l
NOEC (acute)	3.2 mg/l

Phenol, styrenated (61788-44-1)	
Threshold limit algae 1	0.326 mg/l (72 h; Algae)
Threshold limit algae 2	0.140 mg/l (72 h; Algae)

m-Xylylenediamine (1477-55-0)	
LC50 fish 1	75 mg/l
LC50 other aquatic organisms 1	20.3 ppb
EC50 Daphnia 1	15 mg/l
LOEC (chronic)	15 mg/l
NOEC (acute)	10.5 mg/kg
NOEC (chronic)	4.7 mg/l
NOEC chronic crustacea	4.7 mg/l

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
LC50 fish 1	> 100 mg/l (96 h; Pisces; Nominal concentration)
EC50 Daphnia 1	10 - 100 mg/l (Invertebrata; Estimated value)
EC50 other aquatic organisms 1	84 mg/l (72 h; Desmodesmus subspicatus; growth rate; ECHA)
LC50 fish 2	70.9 mg/l (96 h; Pisces)
NOEC (chronic)	2 mg/l (28 d; activated sludge, domestic; respiration rate; ECHA)
Threshold limit algae 1	10 - 100,Algae
Threshold limit algae 2	84 mg/l (72 h; Scenedesmus subspicatus; Growth rate)

12.2. Persistence and degradability

HIT-RE 500 V3, B	
Persistence and degradability	May cause long-term adverse effects in the environment.

2-methyl-1,5-pentanediamine (15520-10-2)	
Persistence and degradability	Biodegradability in water: no data available.

Phenol, styrenated (61788-44-1)	
Persistence and degradability	Not readily biodegradable in water. Biodegradability in soil: no data available. No (test)data on mobility of the substance available.
Biochemical oxygen demand (BOD)	0.000231 g O_2/g substance
Chemical oxygen demand (COD)	0.004827 g O_2/g substance

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
Persistence and degradability	Not readily biodegradable in water. Highly mobile in soil. Low potential for adsorption in soil.

12.3. Bioaccumulative potential

HIT-RE 500 V3, B	
Bioaccumulative potential	Not established.

2-methyl-1,5-pentanediamine (15520-10-2)	
Log Pow	0.27 (Estimated value)
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

Phenol, styrenated (61788-44-1)	
BCF fish 2	3246 mg/l
Log Pow	6.24 - 7.77 (Experimental value; OECD 123: Partition Coefficient (1-Octanol/Water): Slow-Stirring Method)
Bioaccumulative potential	High potential for bioaccumulation (Log Kow > 5).

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
Log Pow	0.77 (Literature; 0.219; Experimental value; Equivalent or similar to OECD 107; 21.5 °C)
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming	No known ecological damage caused by this product.
Other information	Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	Disposal must be done according to official regulations.
Waste disposal recommendations	Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to Avoid release to the environment, Refer to manufacturer/supplier for information on recovery/recycling.
Ecology - waste materials	Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	RID
14.1. UN number			
3259	3259	3259	3259
14.2. UN proper shipping name			
AMINES, SOLID, CORROSIVE, N.O.S.	AMINES, SOLID, CORROSIVE, N.O.S.	Amines, solid, corrosive, n.o.s.	AMINES, SOLID, CORROSIVE, N.O.S.
Transport document description			
UN 3259 AMINES, SOLID, CORROSIVE, N.O.S. (2-methyl-1,5-pentanediamine, m-Xylylendiamin), 8, II, (E)	UN 3259 AMINES, SOLID, CORROSIVE, N.O.S. (2-methyl-1,5-pentanediamine, m-Xylylendiamin), 8, II		
14.3. Transport hazard class(es)			
8	8	8	8
			
14.4. Packing group			
II	II	II	II
14.5. Environmental hazards			
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available			

14.6. Special precautions for user

- Overland transport

Classification code (ADR)	C8
Special provisions (ADR)	274

Limited quantities (ADR)	1kg
Packing instructions (ADR)	P002, IBC08
Mixed packing provisions (ADR)	MP10
Orange plates	
Tunnel restriction code (ADR)	E

- Transport by sea

Special provisions (IMDG)	274
Limited quantities (IMDG)	1 kg
Packing instructions (IMDG)	P002
EmS-No. (Fire)	F-A
EmS-No. (Spillage)	S-B
Stowage category (IMDG)	A
Stowage and segregation (IMDG)	'Separated from' acids.
MFAG-No	154

- Air transport

PCA packing instructions (IATA)	859
PCA max net quantity (IATA)	15kg
Special provisions (IATA)	A3

- Rail transport

Special provisions (RID)	274
Limited quantities (RID)	1kg
Packing instructions (RID)	P002, IBC08
Carriage prohibited (RID)	No

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Aluminium oxide	CAS No 1344-28-1	5 - 10%

15.2. International regulations

CANADA

HIT-RE 500 V3, B	
WHMIS Classification	Class E - Corrosive Material Class D Division 2 Subdivision B - Toxic material causing other toxic effects

EU-Regulations

No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin Corr. 1A	H314
Eye Dam. 1	H318
Skin Sens. 1	H317
STOT SE 3	H335
Aquatic Chronic 3	H412

Full text of hazard classes and H-statements : see section 16

National regulations

Quartz (14808-60-7)
Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date	11/12/2015
Other information	None.

Full text of H-statements:

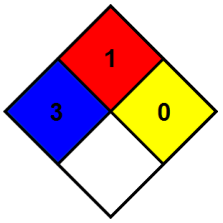
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Carc. 1A	Carcinogenicity, Category 1A
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation, Category 2A
Flam. Liq. 4	Flammable liquids, Category 4
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, Category 1
Skin Sens. 1B	Sensitisation — Skin, category 1B
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H227	Combustible liquid
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H350	May cause cancer
H412	Harmful to aquatic life with long lasting effects

HIT-RE 500 V3, B

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NFPA health hazard	3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
NFPA fire hazard	1 - Must be preheated before ignition can occur.
NFPA reactivity	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability	1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)
Physical	0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.
Personal Protection	B
	B - Safety glasses, Gloves

SDS_US_Hilti

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

HIT-RE 500 V3, A

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 11/13/2015 Revision date: 11/12/2015 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	Mixture
Name	HIT-RE 500 V3, A
Product code	BU Anchor

1.2. Relevant identified uses of the substance or mixture and uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier
Hilti, Inc.
Legacy Tower, Suite 1000
75024 Plano - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

Department issuing data specification sheet
Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
86916 Kaufering - Deutschland
T +49 8191 906310 - F +49 8191 90176310
anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number

Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)

+1 918 8723000
1-800-879-8000 toll free

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Irrit. 2	H315 -	Causes skin irritation
Eye Dam. 1	H318 -	Causes serious eye damage
Skin Sens. 1	H317 -	May cause an allergic skin reaction
Aquatic Chronic 2	H411 -	Toxic to aquatic life with long lasting effects

Full text of H-statements: see section 16

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US)



GHS05 GHS07 GHS09

Signal word (GHS-US) Danger

Hazard statements (GHS-US)
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H411 - Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US)
P260 - Do not breathe fume
P280 - Wear eye protection, protective clothing, protective gloves
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS-US classification
Quartz	(CAS No) 14808-60-7	25 - 40	Carc. 1A, H350
Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700	(CAS No) 25068-38-6	25 - 40	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	(CAS No) 9003-36-5	10 - 25	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411
butanedioldiglycidyl ether	(CAS No) 2425-79-8	5 - 10	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412
1,3 Propanediol, 2 ethyl-2-(hydroxymethyl)-, polymer with 2-(chloromethyl)oxirane	(CAS No) 30499-70-8	5 - 10	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 Aquatic Chronic 3, H412
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	(CAS No) 2530-83-8	2.5 - 5	Eye Dam. 1, H318

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Allow breathing of fresh air. Allow the victim to rest.

First-aid measures after skin contact: Gently wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation occurs: Get immediate medical advice/attention.

First-aid measures after eye contact: Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion: Rinse mouth. Drink plenty of water. Get medical advice/attention. Do not induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation: May cause an allergic skin reaction.

Symptoms/injuries after skin contact: Causes skin irritation.

Symptoms/injuries after eye contact: Causes serious eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water spray. Carbon dioxide. Dry powder. Foam. Sand.
Unsuitable extinguishing media	Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Advice for firefighters

Firefighting instructions	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Protection during firefighting	Self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	Use personal protective equipment as required. Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment	Collect spillage.
Methods for cleaning up	This material and its container must be disposed of in a safe way, and as per local legislation. Recover mechanically the product. On land, sweep or shovel into suitable containers. Store away from other materials.
Other information	Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	Wear personal protective equipment. Avoid contact with skin and eyes. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
Hygiene measures	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Protect from sunlight.
Incompatible products	Strong bases. Strong acids.
Incompatible materials	Sources of ignition. Direct sunlight.
Storage temperature	5 - 25 °C

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional information	The product has a pasty consistency. Exposure limit values for respirable dusts ar not relevant for this product.

8.2. Exposure controls

Personal protective equipment	Avoid all unnecessary exposure. Safety glasses. Gloves. Protective clothing.



Hand protection	Wear protective gloves.
Eye protection	Chemical goggles or safety glasses.
Skin and body protection	Wear suitable protective clothing.
Environmental exposure controls	Avoid release to the environment.
Consumer exposure controls	Avoid contact during pregnancy/while nursing.
Other information	Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste.
Colour	Light grey
Odour	characteristic
Odour threshold	No data available
pH	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	No data available
Explosive limits	No data available
Explosive properties	No data available
Oxidising properties	No data available
Vapour pressure	No data available
Relative density	No data available
Relative vapour density at 20 °C	No data available
Density	1.45 g/cm³
Solubility	insoluble in water.
Log Pow	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available

Viscosity, kinematic	No data available
Viscosity, dynamic	45 - 59 Pa.s 23 °C

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates : fume. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (9003-36-5)	
LD50 oral rat	> 5000 mg/kg bodyweight (Rat; ECHA)
LD50 dermal rat	> 2000 mg/kg bodyweight (Rat; ECHA)

butanedioldiglycidyl ether (2425-79-8)	
LD50 oral rat	2980 mg/kg (Rat)
LD50 dermal rabbit	1130 mg/kg (Rabbit)
ATE US (oral)	1163.000 mg/kg bodyweight
ATE US (dermal)	1130.000 mg/kg bodyweight
ATE US (dust,mist)	1.500 mg/l/4h

Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
LD50 oral rat	> 2000 mg/kg (Rat; OECD 420: Acute Oral toxicity – Acute Toxic Class Method; Experimental value)
LD50 dermal rat	> 2000 mg/kg (Rat; Experimental value; OECD 402: Acute Dermal Toxicity)

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (2530-83-8)	
LD50 oral rat	8025 mg/kg bodyweight (Rat; Equivalent or similar to OECD 401; Experimental value)
LD50 dermal rabbit	4250 mg/kg bodyweight (Rabbit; Experimental value; Equivalent or similar to OECD 402)
ATE US (oral)	8025.000 mg/kg bodyweight
ATE US (dermal)	4250.000 mg/kg bodyweight

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Causes serious eye damage.

Respiratory or skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified Based on available data, the classification criteria are not met
Carcinogenicity	Not classified

Quartz (14808-60-7)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity	Not classified Based on available data, the classification criteria are not met
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration hazard	Not classified
Potential adverse human health effects and symptoms	Based on available data, the classification criteria are not met.
Symptoms/injuries after inhalation	May cause an allergic skin reaction.
Symptoms/injuries after skin contact	Causes skin irritation.
Symptoms/injuries after eye contact	Causes serious eye irritation.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water: Toxic to aquatic life with long lasting effects.

butanedioldiglycidyl ether (2425-79-8)	
LC50 fish 1	24 mg/l (96 h; Pisces) ECHA
LC50 other aquatic organisms 1	> 160 mg/l
NOEC (acute)	40 mg/l
Threshold limit algae 1	88930 mg/l (96 h; Algae)

Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
LC50 fish 1	1.2 mg/l (96 h; Oncorhynchus mykiss; Lethal)
EC50 Daphnia 1	1.1 - 2.8 mg/l (48 h; Daphnia magna; Locomotor effect)
LC50 fish 2	2.3 mg/l (96 h; Oncorhynchus mykiss; Nominal concentration)
Threshold limit algae 1	> 11 mg/l (72 h; Scenedesmus sp.)
Threshold limit algae 2	4.2 mg/l (72 h; Scenedesmus sp.)

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (2530-83-8)	
LC50 fish 1	55 mg/l (96 h; Cyprinus carpio; Young)
EC50 Daphnia 1	473 - 710 mg/l (48 h; Daphnia magna)
LC50 fish 2	237 mg/l 96 h; Salmo gairdneri (Oncorhynchus mykiss)
Threshold limit algae 1	119 mg/l (7 days; Anabaena flosaquae)
Threshold limit algae 2	250 mg/l (72 h; Selenastrum capricornutum)

12.2. Persistence and degradability

HIT-RE 500 V3, A	
Persistence and degradability	May cause long-term adverse effects in the environment.

butanedioldiglycidyl ether (2425-79-8)	
Persistence and degradability	Not readily biodegradable in water.
Biochemical oxygen demand (BOD)	0.01982 g O_2/g substance

Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
Persistence and degradability	Not readily biodegradable in water. Hydrolysis in water. Low potential for adsorption in soil.

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (2530-83-8)	
Persistence and degradability	Not readily biodegradable in water. Hydrolysis in water. No (test)data on mobility of the substance available.

12.3. Bioaccumulative potential

HIT-RE 500 V3, A	
Bioaccumulative potential	Not established.

butanedioldiglycidyl ether (2425-79-8)	
Log Pow	-0.15
Bioaccumulative potential	Bioaccumulation: not applicable.

Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
BCF other aquatic organisms 1	3 - 31
Log Pow	>= 2.918 (Experimental value; EU Method A.8: Partition Coefficient; 25 °C)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (2530-83-8)	
Log Pow	-0.92 (Estimated value)
Bioaccumulative potential	Not bioaccumulative.

12.4. Mobility in soil

Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
Surface tension	0.0 587-0.0589,20 °C

12.5. Other adverse effects

Effect on the global warming: No known ecological damage caused by this product.

Other information: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste): Disposal must be done according to official regulations.

Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to Avoid release to the environment, Refer to manufacturer/supplier for information on recovery/ recycling.

Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	RID
14.1. UN number			
Not regulated for transport			
14.2. UN proper shipping name			
Not applicable	Not applicable	Not applicable	Not applicable
14.3. Transport hazard class(es)			
Not applicable	Not applicable	Not applicable	Not applicable

ADR	IMDG	IATA	RID
Not applicable	Not applicable	Not applicable	Not applicable
14.4. Packing group			
Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards			
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes
ADR 5.2.1.8.1 derogation applies (quantity of liquids ≤ 5 litres or net mass of solids ≤ 5 kg)			
not restricted according ADR Special Provision SP375, IATA-DGR Special Provision A197 and IMDG-Code 2.10.2.7			

14.6. Special precautions for user

- Overland transport

Special provisions (ADR) 375

- Transport by sea

No data available

- Air transport

Special provisions (IATA) A197

- Rail transport

Carriage prohibited (RID) No

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (9003-36-5)	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e., Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C)).
butanedioldiglycidyl ether (2425-79-8)	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.
1,3 Propanediol, 2 ethyl-2-(hydroxymethyl)-, polymer with 2-(chloromethyl)oxirane **(30499-70-8)**	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e., Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C)).
Bisphenol-A-Epichlorhydrin Epoxy resin Average MW < 700 (25068-38-6)	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e., Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C)).
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (2530-83-8)	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

15.2. International regulations

CANADA
No additional information available

EU-Regulations
No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Skin Irrit. 2 H315
Eye Dam. 1 H318
Skin Sens. 1 H317
Aquatic Chronic 2 H411
Full text of hazard classes and H-statements : see section 16

National regulations

Quartz (14808-60-7)
Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date 11/12/2015
Other information None.

Full text of H-statements:

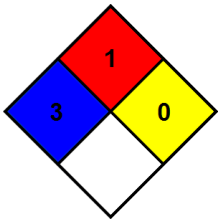
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Carc. 1A	Carcinogenicity, Category 1A
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation, Category 2A
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, Category 1
H302	Harmful if swallowed
H312	Harmful in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H350	May cause cancer
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

HIT-RE 500 V3, A

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

NFPA health hazard	3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
NFPA fire hazard	1 - Must be preheated before ignition can occur.
NFPA reactivity	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability	1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)
Physical	1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
Personal Protection	B
	B - Safety glasses, Gloves

SDS_US_Hilti

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

SAFETY DATA SHEET

This Safety Data Sheet (SDS) is for welding consumables and related products and may be used to comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499 and Canadian Workplace Hazardous Materials Information System (WHMIS) per Health Canada administrative policy. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with ISO 11014-1 and ANSI Z400.1. This document is translated in several languages and is available on our website at www.hobartbrothers.com, from your sales representative or by calling customer service at 1 (937) 332-4000.

SECTION 1 – IDENTIFICATION

Manufacturer/Supplier
Name: HOBART BROTHERS COMPANY
Address: 101 TRADE SQUARE EAST, TROY, OH 45373
Website: www.hobartbrothers.com

Telephone No: +1 (937) 332-4000
Emergency No: +1 (800) 424-9300

Product Type: SHIELDED METAL ARC WELDING (SMAW) ELECTRODES

GROUP A: Product For: CARBON STEEL
AWS Specification: E6010, E6011, E6012, E6013, E6022, E7014, E7024-1

GROUP B: Product For: LOW HYDROGEN CARBON STEEL
AWS Specification: E7016, E7018, E7018-1, E7018-M

GROUP C: Product For: LOW HYDROGEN, LOW ALLOY STEEL
AWS Specification: E7018-A1, E7018-G, E8018-B2, E8018-B2L, E8018-B6, E8018-B8, E8018-C1, E8018-C2, E8018-C3, E8018-G, E9015-B9, E9018-B3, E9018-B3L, E9018-M, E10018-D2, E10018-M, E10518-M, E11018-M, E12018-M

GROUP D: Product For: HIGH STRENGTH CELLULOSE CARBON STEEL
AWS Specification: E7010-P1, E8010-P1, E9010-G, E9010-P1

Recommended Use: SHIELDED METAL ARC WELDING (SMAW) ELECTRODES
Restrictions on Use: Use only as indicated for welding operations

SECTION 2 – IDENTIFICATION OF HAZARDS

HAZARD CLASSIFICATION – The products described in Section 1 are not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

LABEL ELEMENTS: **Hazard Symbol** – No symbol required
Hazard Statement – Not applicable
Signal Word – No signal word required
Precautionary Statement – Not Applicable

HAZARDS NOT OTHERWISE CLASSIFIED

WARNING! - Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.
PRIMARY ROUTES OF ENTRY: Respiratory System, Eyes and/or Skin.
ELECTRIC SHOCK: Arc welding and associated processes can kill. See Section 8.
ARC RAYS: The welding arc can injure eyes and burn skin.
FUMES AND GASES: Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation, plus those from the base metal and coating, etc., of the materials shown in Section 3 of this Safety Data Sheet. Monitor for the component materials identified in the list in Section 3.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, calcium oxide, chromium, fluorspar or fluorides, manganese, nickel, silica and strontium. Other reasonably expected constituents of the fume would also include complex oxides of iron, titanium, silicon and molybdenum. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and F1.3, available from the "American Welding Society", 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS

IMPORTANT - This section covers the hazardous materials from which this product is manufactured. This data has been classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The fumes and gases produced during welding with normal use of this product are addressed in Section 8.

SAFETY DATA SHEET

INGREDIENT	CAS NO.	EINECS[r]	GROUP AND %WEIGHT				GHS Classification(s)	GHS HAZARD STATEMENTS (See Section 16 for Complete Phrases)
			A	B	C	D		
ALUMINUM OXIDE	1344-28-1	215-691-6	<5	<1	<1	---	**NONE**	
CALCIUM CARBONATE	1317-65-3	215-279-6	---	2-10	2-10	---	**NONE**	
CELLULOSE	9004-34-6	232-674-9	<5	---	---	<5	**NONE**	
CHROMIUM (metal)	7440-47-3	231-157-5	---	---	<9	---	**NONE**	
FLUORSPAR	7789-75-5	232-188-7	---	1-12	4-15	---	**NONE**	
IRON	7439-89-6	231-096-4	70-90	60-80	60-90	70-90	**NONE**	
MAGNESIUM CARBONATE	546-93-0	208-915-9	<2	<5	<1	<1	**NONE**	
MANGANESE	7439-96-5	231-105-1	1-5	1-5	1-5	1-5	**- Acute Tox. 4 (Inhalation)(1) - Acute Tox. 4 (Oral) (1) - STOT RE 1(2)**	**H332 H302 H372**
MICA	12001-26-2	None	<5	---	---	---	**NONE**	
MOLYBDENUM	7439-98-7	231-107-2	---	---	<2	<1	**- STOT RE 2(2) - Eye Irrit. 2(3) - STOT SE 3(4)**	**H373 H319 H335**
NICKEL	7440-02-0	231-111-4	---	---	<5	<2	**Powder/Element: - Carc. 2(5) - Skin Sens. 1(6) - STOT RE 1(2) - Aquatic Chronic 3**	**H351 H317 H372 H412**
POTASSIUM SILICATE	1312-76-1	215-199-1	<2	<2	<2	<2	**NONE**	
SILICA	14808-60-7	238-878-4	<7	<8	<7	<7	**- STOT RE 2(2) - Carc. 2(5) - Acute Tox. 4 (Inhalation)(1)**	**H373 H351 H332**
(Amorphous Silica Fume)	69012-64-2	273-761-1	---	---	---	---	**NONE**	
SILICON	7440-21-3	231-130-8	<2	<2	<5	<2	**NONE**	
SODIUM SILICATE	1344-09-8	215-687-4	<2	<2	<2	<2	**NONE**	
STRONTIUM CARBONATE	1633-05-2	216-643-7	---	<2	<2	---	**NONE**	
TITANIUM DIOXIDE	13463-67-7	236-675-5	<14	<10	<5	<5	**- Carc. 2(5)**	**H351**
HEXAVALENT CHROMIUM [CHROMIUM (VI) TRIOXIDE] (Fume constituent)	1333-82-0	215-607-8	Varies	Varies	Varies	Varies	**- Ox. Sol. 1(7) - Carc. 1A(5) - Muta. 1B(8) - Repr. Tox 2(9) - Acute Tox. 2 (Inhalation)(1) - Acute Tox. 3 (Skin & Oral)(1) - STOT RE 1(2) - Skin Corr. 1A(10) - Skin Sens. 1(6) - Resp. Sens. 1(11) - Aquatic Acute 1 - Aquatic Chronic 1**	**H271 H350 H340 H361f H330 H311, H301 H372 H314 H317 H334, H317 H400 H410**

--- Dashes indicate the ingredient is not present within the group of products **Γ** – European Inventory of Existing Chemical Commercial Substance Number **(1)** Acute toxicity (Cat. 1, 2, 3 and 4) **(2)** Specific target organ toxicity (STOT) – repeated exposure (Cat. 1 and 2) **(3)** Serious eye damage/eye irritation (Cat. 1 and 2) **(4)** Specific target organ toxicity (STOT) – single exposure ((Cat. 1, 2) and Cat. 3 for narcotic effects and respiratory tract irritation, only) **(5)** Carcinogenicity (Cat. 1A, 1B and 2) **(6)** Skin sensitization (Cat. 1, Sub-cat. 1A and 1B) **(7)** Oxidizing solid (Cat. 1, 2 and 3) **(8)** Germ cell mutagenicity (Cat. 1A, 1B and 2) **(9)** Reproductive toxicity (Cat. 1A, 1B and 2) **(10)** Skin corrosion/irritation (Cat. 1, 1A, 1B, 1C and 2) **(11)** Respiratory sensitization (Cat. 1, Sub-cat. 1A and 1B)

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SECTION 4 – FIRST AID MEASURES

INGESTION: Not an expected route of exposure. Do not eat, drink, or smoke while welding; wash hands thoroughly before performing these activities. If symptoms develop, seek medical attention at once.
INHALATION during welding: If breathing is difficult, provide fresh air and contact physician. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.
SKIN CONTACT during welding: Remove contaminated clothing and wash the skin thoroughly with soap and water. If symptoms develop, seek medical attention at once.
EYE CONTACT during welding: Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until victim is transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.
Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

SECTION 5 – FIRE-FIGHTING MEASURES

Fire Hazards: Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

Welding arcs and sparks can ignite combustibles and flammable products. If there are flammable materials, including fuel or hydraulic lines, in the work area and the worker cannot move the work or the flammable material, a fire-resistant shield such as a piece of sheet metal or fire resistant blanket should be placed over the flammable material. If welding work is conducted within 35 feet or so of flammable materials, station a responsible person in the work zone to act as fire watcher to observe where sparks are flying and to grab an extinguisher or sound the alarm if needed.
Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard Institute (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.
Suitable Extinguishing Media: This product is essentially nonflammable until welded; therefore, use a suitable extinguishing agent for a surrounding fire.
Unsuitable Extinguishing Media: None known.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

In the case of a release of solid welding consumable products, solid objects can be picked up and placed into a disposal container. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8. Wear proper personal protective equipment while handling. Do not discard as general trash.

SECTION 7 - HANDLING AND STORAGE

HANDLING: No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and product labels.
STORAGE: Keep separate from acids and strong bases to prevent possible chemical reactions.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL (Permissible Exposure Limit) or ACGIH TLV (Threshold Limit Value). The OSHA PEL for Particulates – Not Otherwise Regulated (PNOR) is 5 mg/m^3 – Respirable Fraction, 15 mg/m^3 – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m^3 – Respirable Particles, 10 mg/m^3 – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA PNOR and ACGIH PNOS. An Industrial Hygienist, the OSHA PELs for Air Contaminants (29 CFR 1910.1000), and the ACGIH TLVs should be consulted to determine the specific fume constituents present and their respective exposure limits. All exposure limits are in milligrams per cubic meter (mg/m^3).

INGREDIENT	CAS	EINECS	OSHA PEL	ACGIH TLV
ALUMINUM###	7429-90-5	231-072-3	5 R*, 15 (Dust)	1 R* {A4} 5 (Welding fumes, as Al)
CALCIUM CARBONATE	1317-65-3	215-279-6	5 R*, 5 (as CaO)	3 R*, 2 (as CaO)
CELLULOSE	9004-34-6	232-674-9	5 R*	10 Dust
CHROMIUM#	7440-47-3	231-157-5	1 (Metal) 0.5 (Cr II & Cr III Cpnds) 0.005 (Cr VI Cpnds (Calif. OSHA PEL)	0.5 (Metal) {A4} 0.5 (Cr III Cpnds) {A4} 0.05 (Cr VI Sol Cpnds) {A1} 0.01 (Cr VI Insol Cpnds) {A1}
FLUORSPAR	7789-75-5	232-188-7	2.5 (as F)	2.5 (as F) {A4}
IRON+	7439-89-6	231-096-4	5 R*	5 R* (Fe_2O_3) {A4}
IRON OXIDE	1309-37-1	215-168-2	10 (Oxide Fume)	5 R* (Fe_2O_3) {A4}
MAGNESIUM CARBONATE+	546-93-0	208-915-9	5 R*	3 R*
MANGANESE#	7439-96-5	231-105-1	5 CL ** (Fume) 1, 3 STEL*** ■	0.1 I* {A4} ♦ 0.02 R* ♦♦
MICA	12001-26-2	None	3 R*■	3 R*
MOLYBDENUM	7439-98-7	231-107-2	5 R*	3 R*; 10 I* (Ele and Insol) 0.5 R* (Sol Cpnds) {A3}
NICKEL#	7440-02-0	231-111-4	1 (Metal) 1 (Sol Cpnds) 1 (Insol Cpnds)	1.5 I* (Ele) {A5} 0.1 I* (Sol Cpnds) {A4} 0.2 I* (Insol Cpnds) {A1}
POTASSIUM SILICATE	1312-76-1	215-199-1	Not established	Not established
SILICA++	14808-60-7	238-878-4	0.1 R*	0.025 R* {A2}
(Amorphous Silica Fume)	69012-64-2	273-761-1	0.8	2 R*
SILICON+	7440-21-3	231-130-8	5 R*	3 R*
SODIUM SILICATE	1344-09-8	215-687-4	Not established	Not established
STRONTIUM CARBONATE+	1633-05-2	216-643-7	5 R*	3 R*
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	10 {A4}

R* - Respirable Fraction I* - Inhalable Fraction ** - Ceiling Limit *** - Short Term Exposure Limit + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form #- Reportable material under Section 313 of SARA ## - Reportable material under Section 313 of SARA only in fibrous form ■ - NIOSH REL TWA and STEL ■■ - AIHA Ceiling Limit of 1 mg/m^3 ♦ - Limit of 0.1 mg/m^3 is for Inhalable Mn in 2015 by ACGIH ♦♦ - Limit of 0.02 mg/m^3 is for Respirable Mn in 2015 by ACGIH Ele – Element Sol – Soluble Insol – Insoluble Inorg – Inorganic Cpnds – Compounds NOS – Not Otherwise Specified {A1} - Confirmed Human Carcinogen per ACGIH {A2} - Suspected Human Carcinogen per ACGIH {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4} - Not Classifiable as a Human Carcinogen per ACGIH {A5} - Not Suspected as a Human Carcinogen per ACGIH (noncrystalline form) EINECS – European Inventory of Existing Commercial Chemical Substances OSHA – U.S. Occupational Safety and Health Admininstration ACGIH – American Conference of Governmental Industrial Hygienists

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VENTILATION: Use enough ventilation or local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.
RESPIRATORY PROTECTION: Use NIOSH-approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the regulatory limits.
EYE PROTECTION: Wear helmet or use face shield with filter lens for open arc welding processes. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.
PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark non-synthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.
PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable
SPECIAL PRECAUTIONS (IMPORTANT): When welding with electrodes that require special ventilation (such as stainless or hardfacing, or other products which require special ventilation, or on lead- or cadmium-plated steel and other metals or coatings like galvanized steel, which produce hazardous fumes) maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard Institute (ANSI) Z49.1; Safety in Welding and Cutting published by the American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353; and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.
PHYSICAL STATE: Solid
APPEARANCE: Cored Wire/Coated Rod
COLOR: Gray
ODOR: Not Applicable
ODOR THRESHOLD: Not Applicable
pH: Not Applicable
MELTING POINT/FREEZING POINT: Not Available
INITIAL BOILING POINT AND BOILING RANGE: Not Available
FLASH POINT: Not Available
EVAPORATION RATE: Not Applicable
FLAMMABILITY (SOLID, GAS): Not Available
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: Not Available
VAPOR PRESSURE: Not Applicable
VAPOR DENSITY: Not Applicable
RELATIVE DENSITY: Not Available
SOLUBILITY(IES): Not Available
PARTITION COEFFICIENT: N-OCTANOL/WATER: Not Applicable
AUTO-IGNITION TEMPERATURE: Not Available
DECOMPOSITION TEMPERATURE: Not Available
VISCOSITY: Not Applicable

SECTION 10 – STABILITY AND REACTIVITY

GENERAL: Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.
STABILITY: This product is stable under normal conditions.
REACTIVITY: Contact with acids or strong bases may cause generation of gas.

SECTION 11 – TOXICOLOGICAL INFORMATION

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS: Welding Fumes - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes. **Aluminum Oxide** - Irritation of the respiratory system. **Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Chromium** - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people. **Fluorides** - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis. **Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume. **Magnesium, Magnesium Oxide** - Overexposure to the oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure. **Manganese** - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure. **Mica** - Dust may cause irritation of the respiratory system, skin and eyes. **Molybdenum** - Irritation of the eyes, nose and throat. **Nickel, Nickel Compounds** - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction. **Potassium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Silica (Amorphous)** - Dust and fumes may cause irritation of the respiratory system, skin and eyes. **Sodium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Strontium Compounds** - Strontium salts are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea. **Titanium Dioxide** - Irritation of respiratory system.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS: Welding Fumes - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis." Studies have concluded that there is sufficient evidence for ocular melanoma in welders. **Aluminum Oxide** - Pulmonary fibrosis and emphysema. **Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Fluorides** - Serious bone erosion (Osteoporosis) and mottling of teeth. **Iron, Iron Oxide Fumes** - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe_3O_4) are not regarded as fibrogenic materials. **Magnesium, Magnesium Oxide** - No adverse long term health effects have been reported in the literature. **Manganese** - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. **Mica** - Prolonged overexposure may cause scarring of the lungs and pneumoconiosis characterized by cough, shortness of breath, weakness and weight loss. **Molybdenum** - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia. **Nickel, Nickel Compounds** - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Potassium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Silica (Amorphous)** - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential. **Sodium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Strontium Compounds** - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets". **Titanium Dioxide** - Pulmonary irritation and slight fibrosis.

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MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Chromium VI compounds, nickel compounds and silica (crystalline quartz) are classified as IARC Group 1 and NTP Group K carcinogens. Titanium dioxide, nickel metal/alloys and welding fumes are classified as IARC Group 2B carcinogens.

CALIFORNIA PROPOSITION 65: WARNING: These products contain or produce a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

INGREDIENT	CAS	IARC[E]	NTP[Z]	OSHA[H]	65[Θ]
ALUMINUM OXIDE	1344-28-1	---	---	---	---
CALCIUM CARBONATE	1317-65-3	---	---	---	---
CELLULOSE	9004-34-6	---	---	---	---
CHROMIUM	7440-47-3	3[Σ], 1[ΣΣ]	K[ΣΣ]	X[ΣΣ]	X[ΣΣ]
FLUORSPAR	7789-75-5	---	---	---	---
IRON	7439-89-6	---	---	---	---
IRON OXIDE	1309-37-1	3	---	---	---
MAGNESIUM CARBONATE	546-93-0	---	---	---	---
MANGANESE	7439-96-5	---	---	---	---
MICA	12001-26-2	---	---	---	---
MOLYBDENUM	7439-98-7	---	---	---	---
NICKEL	7440-02-0	2B[β], 1[ββ]	S[β], K[ββ]	---	X[β], X[ββ]
POTASSIUM SILICATE	1312-76-1	---	---	---	---
SILICA	14808-60-7	1[Ψ]	K	---	X
(Amorphous Silica fume)	69012-64-2	3	--	---	---
SILICON	7440-21-3	---	---	---	---
SODIUM SILICATE	1344-09-8	---	---	---	---
STRONTIUM CARBONATE	1633-05-2	---	---	---	---
TITANIUM DIOXIDE	13463-67-7	2B	---	---	X
Welding Fumes	--	2B	--	---	--

E – International Agency for Research on Cancer (1 – Carcinogenic to Humans, 2A – Probably Carcinogenic to Humans, 2B – Possibly Carcinogenic to Humans, 3 – Not Classifiable as to its Carcinogenicity to Humans, 4 --- Probably Not Carcinogenic to Humans) Z – US National Toxicology Program (K – Known Carcinogen, S – Suspected Carcinogen) H – OSHA Designated Carcinogen List Θ – California Proposition 65 (X – On Proposition 65 list) Σ – Chromium Metal and Chromium III Compounds ΣΣ – Chromium VI β – Nickel metal and alloys ββ -- Nickel compounds Ψ – Silica Crystalline α-Quartz --- Dashes indicate the ingredient is not listed with the IARC, NTP, OSHA or Proposition 65

SECTION 12 – ECOLOGICAL INFORMATION

Welding processes can release fumes directly to the environment. Welding wire can degrade if left outside and unprotected. Residues from welding consumables and processes could degrade and accumulate in the soil and groundwater.

SECTION 13 – DISPOSAL CONSIDERATIONS

Use recycling procedures if available. Discard any product, residue, packaging, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

No international regulations or restrictions are applicable. No special precautions are necessary.

SECTION 15 – REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label and the safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.
United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.
CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

Ingredient name	**RQ(lb)**	**TPQ (lb)**
Products on this SDS are a solid solution in the form of a solid article.	--	--

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.
Section 311 Hazard Class
As shipped: Immediate In use: Immediate delayed
EPCRA/SARA TITLE III 313 TOXIC CHEMICALS: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potentially subject to annual SARA 312 reporting: Aluminum Oxide (fibrous forms),Chromium, Manganese and Nickel. See Section 3 for weight percentage.
CANADIAN WHMIS CLASSIFICATION: Class D; Division 2, Subdivision A
CANADIAN CONTROLLED PRODUCTS REGULATION: This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

SECTION 16 – OTHER INFORMATION

The following Hazard Statements, provided in the OSHA Hazard Communication Standard (29 CFR Part 1910.1200) correspond to the columns labeled 'GHS Hazard Statements' within Section 3 of this safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

H271: May cause fire or explosion; strong oxidizer
H301: Toxic if swallowed
H302: Harmful if swallowed

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H311: Toxic in contact with skin
H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction
H319: Causes serious eye irritation
H330: Fatal if inhaled
H332: Harmful if inhaled
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335: May cause respiratory irritation
H340: May cause genetic defects
H350: May cause cancer
H351: Suspected of causing cancer
H361f: Suspected of damaging fertility or the unborn child
H372: Causes damage to organs through prolonged or repeated exposure
H373: May cause damage to organs through prolonged or repeated exposure
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H412: Harmful to aquatic life with long lasting effects.

For additional information please refer to the following sources:

USA: **American National Standard Institute (ANSI) Z49.1** "Safety in Welding and Cutting", **ANSI/American Welding Society (AWS) F1.5** "Methods for Sampling and Analyzing Gases from Welding and Allied Processes", **ANSI/AWS F1.1** "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", **AWSF3.2M/F3.2** "Ventilation Guide for Weld Fume", American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353. Safety and Health Fact Sheets available from AWS at www.aws.org.

OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.

Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.

NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

Canada: **CSA Standard CAN/CSA-W117.2-01** "Safety in Welding, Cutting and Allied Processes".

Hobart Brothers Company strongly recommends the users of this product study this SDS, the product label information and become aware of all hazards associated with welding. Hobart Brothers Company believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers Company cannot make any expressed or implied warranty as to this information.

SAFETY DATA SHEET
Klean Strip Denatured Alcohol

Printed: 04/13/2015
Revision: 04/13/2015
Supersedes Revision: 09/10/2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Klean Strip Denatured Alcohol	
Company Name:	W. M. Barr 2105 Channel Avenue Memphis, TN 38113	**Phone Number:** (901)775-0100
Web site address:	www.wmbarr.com	
Emergency Contact:	3E 24 Hour Emergency Contact	(800)451-8346
Information:	W.M. Barr Customer Service	(800)398-3892
Intended Use:	Cleans glass and is used as a fuel for marine stoves	
Synonyms:	CSL26, GSL26, QSL26, QSL26W	
Additional Information	This product is regulated by the United States Consumer Product Safety Commission and is subject to certain labeling requirements under the Federal Hazardous Substances Act. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS). The product label also includes other important information, including directions for use, and should always be read in its entirety prior to using the product.	

2. HAZARDS IDENTIFICATION

Flammable Liquids, Category 2
Acute Toxicity: Oral, Category 3
Acute Toxicity: Skin, Category 3
Acute Toxicity: Inhalation, Category 3
Specific Target Organ Toxicity (single exposure), Category 1



GHS Signal Word: **Danger**

GHS Hazard Phrases:
H225: Highly flammable liquid and vapor.
H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H331: Toxic if inhaled.
H370: Causes damage to organs.

GHS Precaution Phrases:
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233: Keep container tightly closed.
P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ventilating/lighting equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P260: Do not breathe gas/mist/vapors/spray.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P235: Keep cool.

GHS Response Phrases:
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P302+352: IF ON SKIN: Wash with plenty of soap and water.
P303+361+353: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P307+311: IF exposed: Call a POISON CENTER or doctor/physician.
P311: Call a POISON CENTER or doctor/physician.
P330: Rinse mouth.
P361: Remove/Take off immediately all contaminated clothing.
P363: Wash contaminated clothing before reuse.
P370+378: In case of fire, use dry chemical powder to extinguish.

GHS Storage and Disposal Phrases:
P403+233: Store container tightly closed in well-ventilated place.
P405: Store locked up.
P501: Dispose of contents/container to local, state and federal regulations.

Hazard Rating System:

HMIS:

HEALTH *	2
FLAMMABILITY	3
PHYSICAL	0
PPE	X

NFPA:



OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

Potential Health Effects (Acute and Chronic):

Inhalation Acute Exposure Effects:
Vapor harmful. May cause dizziness, headache, watering of eyes, irritation of respiratory tract, irritation to the eyes, drowsiness, nausea, other central nervous system effects, spotted or blurry vision, dilation of pupils, and convulsions.

Skin Contact Acute Exposure Effects:
May cause irritation, drying of skin, redness, and dermatitis. May cause symptoms listed under inhalation. May be absorbed through damaged skin.

Eye Contact Acute Exposure Effects:
May cause irritation.

Ingestion Acute Exposure Effects:
Poison. Cannot be made non-poisonous. May be fatal or cause blindness. May produce fluid in the lungs and pulmonary edema. May cause dizziness, headache, nausea, drowsiness, loss of coordination, stupor, reddening of face and or neck, liver, kidney and heart damage, coma, and death. May produce symptoms listed under inhalation.

Chronic Exposure Effects:
May cause symptoms listed under inhalation, dizziness, fatigue, tremors, permanent central nervous system changes, blindness, pancreatic damage, and death.

Target Organs:
Liver, kidneys, pancreas, heart, lungs, brain, central nervous system, eyes

Medical Conditions Generally Aggravated By Exposure: Diseases of the liver, skin, lung, kidney, central nervous system, pancreas, and heart; asthma; inflammatory or fibrotic pulmonary disease; any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease, or anemias

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Hazardous Components (Chemical Name)	Concentration	RTECS #
64-17-5	Ethyl alcohol {Ethanol}	30.0 -50.0 %	KQ6300000
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	40.0 -60.0 %	PC1400000

Additional Chemical Information Specific percentage of composition is being withheld as a trade secret.

4. FIRST AID MEASURES

Emergency and First Aid Procedures:

Skin:
Immediately begin washing the skin thoroughly with large amounts of water and mild soap, if available, while removing contaminated clothing. Seek medical attention if irritation persists.

Eyes:
Immediately begin to flush eyes with water, remove any contact lens. Continue to flush the eyes for at least 15 minutes, then seek immediate medical attention.

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

Ingestion:
If swallowed, do NOT induce vomiting. Seek immediate medical attention. Call a physician, hospital emergency room, or poison control center immediately. Never give anything by mouth to an unconscious person.

Signs and Symptoms Of Exposure: See Potential Health Affects

Note to Physician: Poison. This product contains methanol. Methanol is metabolized to formaldehyde and formic acid. These metabolites may cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used as an antidote. Methanol is effectively removed by hemodialysis. Call your local poison control center for further instructions.

5. FIRE FIGHTING MEASURES

OSHA Class IB

Flash Pt: 45.00 F Method Used: Setaflash Closed Cup (Rapid Setaflash)

Explosive Limits: LEL: No data. UEL: No data.

Autoignition Pt: No data.

Suitable Extinguishing Media: Use carbon dioxide, dry powder, or alcohol resistant foam.

Unsuitable Extinguishing Media: Water may be ineffective. Solid streams of water will likely spread the fire.

Fire Fighting Instructions: Self-contained respiratory protection should be provided for fire fighters fighting fires in buildings or confined area. Storage containers exposed to fire should be kept cool with water spray to prevent pressure build-up. Stay away from heads of containers that have been exposed to intense heat or flame.

Flammable Properties and Hazards: Vapors are heavier than air. Vapor may travel considerable distance to source of ignition and flash back.

Flammability Classification:

6. ACCIDENTAL RELEASE MEASURES

Steps To Be Taken In Case Material Is Released Or Spilled:

Vapors are heavier than air. Vapors may cause flash fire or ignite explosively.

Clean up: Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Shut off ignition sources; keep flares, smoking or flames out of hazard area. Use non-sparking tools. Use proper bonding and grounding methods for all equipment and processes. Keep out of waterways and bodies of water. Be cautious of vapors collecting in small enclosed spaces, sewers, low lying areas, confined spaces, etc.

Small spills: Take up with sand, earth or other noncombustible absorbent material and place in a plastic container where applicable.

Large spills: Dike far ahead of spill for later disposal.

Waste Disposal: Dispose in accordance with applicable local, state and federal regulations.

7. HANDLING AND STORAGE

Precautions To Be Taken in Handling:

Read carefully all cautions and directions on product label before use. Since empty container retains residue, follow all label warnings even after container is empty. Dispose of empty container according to all regulations. Do not reuse this container.

Do not use this product near any source of heat or open flame, furnace areas, pilot lights, stoves, etc.

Do not use in small enclosed spaces, such as basements and bathrooms where vapors can accumulate. Vapors can accumulate and explode if ignited.

Do not use this product if the work area is not well ventilated. Use only with adequate ventilation to prevent build up of vapors.

Do not spread this product over large surface areas because fire and health safety risks will increase dramatically.

Use proper bonding and grounding when transferring material. Be aware of static electricity generation when handling material.

Precautions To Be Taken in Storing:

Keep container tightly closed when not in use. Store in a cool, dry place. Do not store near any source of heat or open flame, furnace areas, pilot lights, stoves, etc.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits
64-17-5	Ethyl alcohol {Ethanol}	PEL: 1000 ppm	TLV: 1000 ppm	No data.
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	PEL: 200 ppm	TLV: 200 ppm STEL: 250 ppm	No data.

Respiratory Equipment (Specify Type): For use in areas with inadequate ventilation or fresh air, wear a properly maintained and properly fitted NIOSH approved respirator for organic solvent vapors.

For OSHA controlled work places and other regular users - Use only with adequate ventilation under engineered air control systems designed to prevent exceeding the appropriate TLV.

A dust mask does not provide protection against vapors.

Eye Protection: Chemical splash goggles should be worn to prevent eye contact.

Protective Gloves: Wear gloves with as much resistance to the chemical ingredients as possible. Glove materials such as nitrile, natural rubber, and neoprene will provide protection. Glove selection should be based on chemicals being used and conditions of use. Consult your glove supplier for additional information. Gloves contaminated with product should be discarded and not reused.

Other Protective Clothing: Various application methods can dictate the use of additional protective safety equipment, such as impermeable aprons, etc., to minimize exposure.

Engineering Controls (Ventilation etc.): Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Use only with adequate ventilation to prevent buildup of vapors. Do not use in areas where vapors can accumulate and concentrate, such as basements, bathrooms or small enclosed areas. Whenever possible, use outdoors in an open air area. If using indoors open all windows and doors and maintain a cross ventilation of moving fresh air across the work area. If strong odor is noticed or you experience slight dizziness, headache, nausea or eye-watering -- STOP -- ventilation is inadequate. Leave area immediately and move to fresh air.

Work/Hygienic/Maintenance Practices: Wash hands thoroughly after use and before eating, drinking, smoking, or using the restroom.

Do not eat, drink, or smoke in the work area.

Discard any clothing or other protective equipment that cannot be decontaminated.

Facilities storing or handling this material should be equipped with an emergency eyewash and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical States:	[ ] Gas [X] Liquid [ ] Solid
Appearance and Odor:	Water white, alcohol odor
Melting Point:	No data.
Boiling Point:	147.00 F
Autoignition Pt:	No data.
Flash Pt:	45.00 F Method Used: Setaflash Closed Cup (Rapid Setaflash)
Explosive Limits:	LEL: No data. UEL: No data.
Specific Gravity (Water = 1):	0.7934 - 0.8108
Density:	6.646 LB/GL
Vapor Pressure (vs. Air or mm Hg):	76 MM HG at 68.0 F
Vapor Density (vs. Air = 1):	> 1
Evaporation Rate:	> 1
Solubility in Water:	No data.
Percent Volatile:	100.0 % by weight.
VOC / Volume:	793.0000 G/L

10. STABILITY AND REACTIVITY

Stability:	Unstable [ ] Stable [X]
Conditions To Avoid - Instability:	No data available.
Incompatibility - Materials To Avoid:	Incompatible with strong oxidizing agents, strong acids, reactive metals, halogens, strong inorganic acids, and aldehydes.
Hazardous Decomposition Or Byproducts:	Decomposition may produce carbon monoxide and carbon dioxide.
Possibility of Hazardous Reactions:	Will occur [ ] Will not occur [X]
Conditions To Avoid - Hazardous Reactions:	No data available.

11. TOXICOLOGICAL INFORMATION

Toxicological Information: This product has not been tested as a whole. Refer to section 2 for acute and chronic effects.

Carcinogenicity/Other Information:
IARC 1 - Carcinogenic to Humans
IARC 2B - Possibly Carcinogenic to Humans
ACGIH A4 - Not Classifiable as a Human Carcinogen.

IARC has determined that the consumption of alcoholic beverages is casually related to the occurrence of malignant tumors of the oral cavity, pharynx, larynx, esophagus, and liver in humans. The carcinogenic response attributed to drinking alcoholic beverages has not be verified in studies with laboratory animals. Established uses of denatured ethanol and non-beverage use of pure ethanol are not considered to pose any significant cancer hazard.

CAS #	Hazardous Components (Chemical Name)	NTP	IARC	ACGIH	OSHA
64-17-5	Ethyl alcohol {Ethanol}	n.a.	1	A4	n.a.
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	n.a.	n.a.	n.a.	n.a.

12. ECOLOGICAL INFORMATION

General Ecological Information: This product has not been tested as a whole.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose in accordance with applicable local, state, and federal regulations.

14. TRANSPORT INFORMATION

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Alcohols, n.o.s. (Ethyl Alcohol, Methanol)
DOT Hazard Class: 3 FLAMMABLE LIQUID
UN/NA Number: UN1987 **Packing Group:** II



Additional Transport Information: The shipper / supplier may apply one of the following exceptions: Combustible Liquid, Consumer Commodity, Limited Quantity, Viscous Liquid, Does Not Sustain Combustion, or others, as allowed under 49CFR Hazmat Regulations. Please consult 49CFR Subchapter C to ensure that subsequent shipments comply with these exceptions.

15. REGULATORY INFORMATION

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
64-17-5	Ethyl alcohol {Ethanol}	No	No	No
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	No	Yes 5000 LB	Yes

This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:	[X] Yes [ ] No	Acute (immediate) Health Hazard
	[X] Yes [ ] No	Chronic (delayed) Health Hazard
	[X] Yes [ ] No	Fire Hazard
	[ ] Yes [X] No	Sudden Release of Pressure Hazard
	[ ] Yes [X] No	Reactive Hazard

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
64-17-5	Ethyl alcohol {Ethanol}	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	CAA HAP,ODC: HAP; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: Yes

Regulatory Information Statement: All components of this material are listed on the TSCA Inventory or are exempt.

16. OTHER INFORMATION

Revision Date: 04/13/2015

Preparer Name: W.M. Barr EHS Dept (901)775-0100

Additional Information About This Product: No data available.

Company Policy or Disclaimer: The information contained herein is presented in good faith and believed to be accurate as of the effective date shown above. This information is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determination of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Any use of this data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.

SAFETY DATA SHEET
Klean Strip Lacquer Thinner

Revision: 05/24/2017
Supersedes Revision: 04/03/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Klean Strip Lacquer Thinner

Company Name: W. M. Barr
2105 Channel Avenue
Memphis, TN 38113

Phone Number: (901)775-0100

Web site address: www.wmbarr.com

Emergency Contact: 3E 24 Hour Emergency Contact (800)451-8346
Information: W.M. Barr Customer Service (800)398-3892

Intended Use: Paint, stain, and varnish thinning.

Product Code: GML170, QML170, CML170, DML170, GML170P, PA12782, QML170W, GML170W, GML170HDWS, PML1701

2. HAZARDS IDENTIFICATION

Flammable Liquids, Category 2
Acute Toxicity: Oral, Category 3
Acute Toxicity: Skin, Category 3
Acute Toxicity: Inhalation, Category 3
Serious Eye Damage/Eye Irritation, Category 2
Toxic To Reproduction, Category 2
Specific Target Organ Toxicity (single exposure), Category 1
Specific Target Organ Toxicity (repeated exposure), Category 2
Aspiration Toxicity, Category 1



GHS Signal Word: **Danger**

GHS Hazard Phrases:
H225: Highly flammable liquid and vapor.
H301: Toxic if swallowed.
H304: May be fatal if swallowed and enters airways.
H311: Toxic in contact with skin.
H319: Causes serious eye irritation.
H331: Toxic if inhaled.
H361: Suspected of damaging fertility or the unborn child.
H370: Causes damage to organs.
H373: May cause damage to organs through prolonged or repeated exposure.

GHS Precaution Phrases:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233: Keep container tightly closed.
P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ventilating/lighting equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P260: Do not breathe gas/mist/vapors/spray.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P281: Use personal protective equipment as required.
P235: Keep cool.

GHS Response Phrases:

P301+310: IF SWALLOWED: Immediately P311: Call a POISON CENTER or doctor/physician.
P302+352: IF ON SKIN: Wash with plenty of soap and water.
P303+361+353: IF ON SKIN (or hair): P361: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307+311: IF exposed: P311: Call a POISON CENTER or doctor/physician.
P308+313: IF exposed or concerned: Get medical attention/advice.
P314: Get medical attention/advice if you feel unwell.
P321: Specific treatment see label.
P330: Rinse mouth.
P331: Do NOT induce vomiting.
P337+313: If eye irritation persists, get medical advice/attention.
P363: Wash contaminated clothing before reuse.
P370+378: In case of fire, use dry chemical powder to extinguish.

GHS Storage and Disposal Phrases:

P403+233: Store container tightly closed in well-ventilated place.
P405: Store locked up.
P501: Dispose of contents/container according to local, state and federal regulations.

Hazard Rating System:



HMIS:



NFPA:

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

Potential Health Effects (Acute and Chronic):

Inhalation Acute Exposure Effects:
Vapor harmful. May cause dizziness; headache; watering of eyes; irritation of respiratory tract; weakness; drowsiness; nausea; numbness in fingers, arms and legs; depression of central nervous system; loss of appetite; fatigue; hallucinations; light headedness; visual disturbances; giddiness and intoxication; sleepiness; cough and dyspnea; cold, clammy extremities; diarrhea; vomiting; dilation of pupils; spotted vision. Severe overexposure may cause convulsions; unconsciousness; coma; and death. Intentional misuse of this product by deliberately concentrating and inhaling can be harmful or fatal.

Skin Contact Acute Exposure Effects:
May be absorbed through the skin. May cause irritation; numbness in the fingers and arms; drying of skin; and dermatitis. May cause increased severity of symptoms listed under inhalation.

Eye Contact Acute Exposure Effects:
This material is an eye irritant. May cause irritation; burns; conjunctivitis of eyes; and corneal ulcerations of the eye. Vapors may irritate eyes.

Ingestion Acute Exposure Effects:
Poison. Cannot be made non-poisonous. May be fatal or cause blindness. May cause dizziness; headache; nausea; vomiting; burning sensation in mouth, throat, and stomach; loss of coordination; depression of the central nervous system; narcosis; stupor; gastrointestinal irritation; liver, kidney, and heart damage; diarrhea; loss of appetite; coma and death. May produce symptoms listed under inhalation.

Chronic Exposure Effects:
Reports have associated repeated and prolonged overexposure to solvents with neurological and other physiological damage. Prolonged or repeated contact may cause dermatitis. Prolonged skin contact may result in absorption of a harmful amount of this material. May cause conjunctivitis; gastric disturbances; insomnia; dizziness; headache; weakness; fatigue; nausea; heart palpitations; skin irritation; numbness in hands and feet; permanent central nervous system changes; some loss of memory; pancreatic damage; giddiness; visual impairment or blindness; kidney or liver damage; and death. May cause symptoms listed under inhalation.

Target Organs: Central Nervous System, Liver, Kidney, Heart, Stomach, Respiratory System

Primary Routes of Entry: Inhalation, Ingestion, Skin Absorption

Medical Conditions Generally Aggravated By Exposure: Diseases of the skin, eyes, liver, kidneys, central nervous system and respiratory system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Hazardous Components (Chemical Name)	Concentration
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	25.0 -35.0 %
67-64-1	Acetone {2-Propanone}	20.0 -30.0 %
NA	Petroleum Hydrocarbon Mixture (Alkanes and Cycloalkanes)	20.0 -30.0 %
141-78-6	Acetic acid, ethyl ester {Ethyl acetate}	<15.0 %
108-88-3	Toluene {Benzene, Methyl-; Toluol}	< 5.0 %
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	< 5.0 %

Additional Chemical Information Specific percentage of composition is being withheld as a trade secret.

4. FIRST AID MEASURES

Emergency and First Aid Procedures:

Skin:
Immediately begin washing the skin thoroughly with large amounts of water and mild soap, if available, while removing contaminated clothing. Seek medical attention if irritation persists.

Eyes:
Immediately begin to flush eyes with water, remove any contact lens. Continue to flush the eyes for at least 15 minutes, then seek immediate medical attention.

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting. Seek immediate medical attention. Call a physician, hospital emergency room, or poison control center immediately. Never give anything by mouth to an unconscious person.

In Case of Inhalation: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

In Case of Skin Contact: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

In Case of Eye Contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

In Case of Ingestion: If swallowed, do NOT induce vomiting. Call a physician, hospital emergency room, or poison control center immediately. Never give anything by mouth to an unconscious person.

Signs and Symptoms Of Exposure: See Potential Health Effects.

Note to Physician: Poison. This product contains methanol. Methanol is metabolized to formaldehyde and formic acid. These metabolites may cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used as an antidote. Methanol is effectively removed by hemodialysis. Call your local poison control center for further information.

5. FIRE FIGHTING MEASURES

NFPA Class IB

Flash Pt: < 15.00 F Method Used: Setaflash Closed Cup (Rapid Setaflash)

Explosive Limits: LEL: 1 UEL: 7

Autoignition Pt: No data.

Suitable Extinguishing Media: Use carbon dioxide, dry powder, or foam.

Unsuitable Extinguishing Media: Do not use a solid water stream, as this may spread the fire.

Fire Fighting Instructions: Self-contained respiratory protection should be provided for fire fighters fighting fires in buildings or confined areas. Storage containers exposed to fire should be kept cool with water spray to prevent pressure build-up. Stay away from heads of containers that have been exposed to intense heat or flame.

Flammable Properties and Hazards: No data available.

6. ACCIDENTAL RELEASE MEASURES

Steps To Be Taken In Case Material Is Released Or Spilled: Vapors may cause flash fire or ignite explosively.

Clean up: Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Shut off ignition sources; keep flares, smoking or flames out of hazard area. Use non-sparking tools. Use proper bonding and grounding methods for all equipment and processes. Keep out of waterways and bodies of water. Be cautious of vapors collecting in small enclosed spaces, sewers, low lying areas, confined spaces, etc.

Small spills: Take up with sand, earth or other noncombustible absorbent material and place in a plastic container where applicable.

Large spills: Dike far ahead of spill for later disposal.

Waste Disposal: Dispose in accordance with applicable local, state and federal regulations.

7. HANDLING AND STORAGE

Precautions To Be Taken In Handling:

Do not use in small enclosed spaces, such as basements and bathrooms. Vapors can accumulate and explode if ignited.
Read carefully all cautions and directions on product label before use. Since empty container retains residue, follow all label warnings even after container is empty. Dispose of empty container according to all regulations. Do not reuse this container.

Do not use this product near any source of heat or open flame, furnace areas, pilot lights, stoves, etc.

Do not use in small enclosed spaces, such as basements and bathrooms. Vapors can accumulate and explode if ignited.

Do not spread this product over large surface areas because fire and health safety risks will increase dramatically.

Precautions To Be Taken In Storing:

Keep container tightly closed when not in use. Store in a cool, dry place. Do not store near flames or at elevated temperatures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	PEL: 200 ppm	TLV: 200 ppm STEL: 250 ppm	No data.
67-64-1	Acetone {2-Propanone}	PEL: 1000 ppm	TLV: 500 ppm STEL: 750 ppm	No data.
NA	Petroleum Hydrocarbon Mixture (Alkanes and Cycloalkanes)	No data.	TLV: 1500 mg/m3	No data.
141-78-6	Acetic acid, ethyl ester {Ethyl acetate}	PEL: 400 ppm	TLV: 400 ppm	No data.
108-88-3	Toluene {Benzene, Methyl-; Toluol}	PEL: 200 ppm STEL: 500 ppm/(10min) CEIL: 300 ppm	TLV: 50 ppm	No data.
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	PEL: 50 ppm	TLV: 20 ppm	No data.

Respiratory Equipment (Specify Type):

For OSHA controlled work place and other regular users. Use only with adequate ventilation under engineered air control systems designed to prevent exceeding appropriate TLV.

For occasional use, where engineered air control is not feasible, use properly maintained and properly fitted NIOSH approved respirator for organic solvent vapors. A dust mask does not provide protection against vapors.

Eye Protection:

Protect eyes with chemical splash goggles.

Protective Gloves:

Wear gloves with as much resistance to the chemical ingredients as possible. Glove materials such as nitrile rubber may provide protection. Glove selection should be based on chemicals being used and conditions of use. Consult your glove supplier for additional information. Gloves contaminated with product should be discarded and not reused.

Other Protective Clothing:

Various application methods can dictate use of additional protective safety equipment,

such as impermeable aprons, etc., to minimize exposure.

Engineering Controls (Ventilation etc.): Use only with adequate ventilation to prevent build-up of vapors. Open all windows and doors. Use only with a cross ventilation of moving fresh air across the work area. If strong odor is noticed or you experience slight dizziness, headache, nausea, or eye-watering - Stop - ventilation is inadequate. Leave area immediately.

Do not use in small enclosed spaces, such as basements and bathrooms.

Work/Hygienic/Maintenance Practices: A source of clean water should be available in the work area for flushing eyes and skin.
Do not eat, drink, or smoke in the work area.
Wash hands thoroughly after use.
Before reuse, thoroughly clean any clothing or protective equipment that has been contaminated by prior use.
Discard any clothing or other protective equipment that cannot be decontaminated, such as gloves or shoes.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical States:	[ ] Gas [X] Liquid [ ] Solid
Appearance and Odor:	Water White / Free and Clear
Melting Point:	No data.
Boiling Point:	133.00 F
Autoignition Pt:	No data.
Flash Pt:	< 15.00 F Method Used: Setaflash Closed Cup (Rapid Setaflash)
Explosive Limits:	LEL: 1 UEL: 7
Specific Gravity (Water = 1):	0.7742 - 0.7942
Density:	6.518 LB/GL
Vapor Pressure (vs. Air or mm Hg):	115 MM HG at 68.0 F
Vapor Density (vs. Air = 1):	> 1
Evaporation Rate:	> 1
Solubility in Water:	Slight
Viscosity:	Water thin
Percent Volatile:	100.0 % by weight.
VOC / Volume:	600.0000 G/L

10. STABILITY AND REACTIVITY

Stability:	Unstable [ ] Stable [X]
Conditions To Avoid - Instability:	No data available.
Incompatibility - Materials To Avoid:	Incompatible with strong oxidizing agents, strong caustics, hydrogen peroxide, and nitrates.
Hazardous Decomposition or Byproducts:	Decomposition may produce carbon monoxide; carbon dioxide
Possibility of Hazardous Reactions:	Will occur [ ] Will not occur [X]
Conditions To Avoid - Hazardous Reactions:	No data available.

11. TOXICOLOGICAL INFORMATION

Toxicological Information: This product has not been tested as a whole. Information below will be for individual ingredients. Refer to section 2 for acute and chronic effects.

CAS# 67-64-1:
Standard Draize Test, Eyes, Species: Rabbit, 20.00 MG, Severe.
Result:
Behavioral: Change in motor activity (specific assay).
Behavioral: Alteration of classical conditioning.
- American Journal of Ophthalmology., Ophthalmic Pub. Co., 435 N. Michigan Ave., Suite 1415, Chicago, IL 60611, Vol/p/yr: 29,1363, 1946

CAS# 141-78-6:
Standard Draize Test, Eyes, Human, 400.0 PPM.
Result:
Liver: Hepatitis (hepatocellular necrosis), zonal.
- Journal of Industrial Hygiene and Toxicology, Vol/p/yr: 25,282, 1943

CAS# 108-88-3:
Reproductive Effects:, TCLo, Inhalation, Rat, 800.0 MG/M3, 6 H, female 14-20 day(s) after conception.
Result:
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Effects on Newborn: Behavioral.
- Brazilian Journal of Medical and Biological Research., Vol/p/yr: 23,533, 1990

Standard Draize Test, Eyes, Species: Rabbit, 2.000 MG, 24 H, Severe.
Result:
Effects on Embryo or Fetus: Other effects to embryo.
Specific Developmental Abnormalities: Eye, ear.
- Prehled Prumyslove Toxikologie, Marhold, J., Organicke Latky, Prague Czechoslovakia, Vol/p/yr: -,29, 1986

CAS# 111-76-2:
Acute toxicity, LC50, Inhalation, Rat, 450.0 PPM, 4 H.
Result:
Behavioral: Ataxia.
Nutritional and Gross Metabolic:Weight loss or decreased weight gain.
- Toxicology and Applied Pharmacology, Academic Press, Inc., 1 E. First St., Duluth, MN 55802, Vol/p/yr: 68,405, 1983

Acute toxicity, LD50, Skin, Species: Rabbit, 220.0 MG/KG.
Result:
Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).
Effects on Embryo or Fetus: Other effects to embryo.
Specific Developmental Abnormalities: Musculoskeletal system.
- Dow Chemical Company Reports., Dow Chemical USA, Health and Environment Research, Toxicology Research Lab, Midland, MI 48640, Vol/p/yr: MSD-46,

Chronic Toxicological Effects:

Acute toxicity, LD50, Oral, Rat, 250.0 mg/kg.
Result:
Lungs, Thorax, or Respiration:Changes in pulmonary vascular resistance.

Standard Draize Test, Eyes, Species: Rabbit, 100.0 MG, Severe.
Result:
Effects on Newborn: Apgar score (human only).
Effects on Newborn: Other neonatal measures or effects.
Effects on Newborn: Drug dependency.
- American Journal of Ophthalmology., Ophthalmic Pub. Co., 435 N. Michigan Ave., Suite 1415, Chicago, IL 60611, Vol/p/yr: 29,1363, 1946

Carcinogenicity/Other Information:

IARC 3: Not Classifiable as to Carcinogenicity in Humans
ACGIH A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
ACGIH A4 - Not Classifiable as a Human Carcinogen

CAS #	Hazardous Components (Chemical Name)	NTP	IARC	ACGIH	OSHA
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	n.a.	n.a.	n.a.	n.a.
67-64-1	Acetone {2-Propanone}	n.a.	n.a.	A4	n.a.
NA	Petroleum Hydrocarbon Mixture (Alkanes and Cycloalkanes)	n.a.	n.a.	n.a.	n.a.
141-78-6	Acetic acid, ethyl ester {Ethyl acetate}	n.a.	n.a.	n.a.	n.a.
108-88-3	Toluene {Benzene, Methyl-; Toluol}	n.a.	3	A4	n.a.
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	n.a.	3	A3	n.a.

12. ECOLOGICAL INFORMATION

General Ecological Information: This product has not been tested as a whole. Information below will be for individual ingredients.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of in accordance with all applicable local, state, and federal regulations.

14. TRANSPORT INFORMATION

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Paint Related Material
DOT Hazard Class: 3 FLAMMABLE LIQUID
UN/NA Number: UN1263 **Packing Group:** II



Additional Transport Information: The shipper/supplier may apply one of the following exceptions: Combustible Liquid, Consumer Commodity, Limited Quantity, Viscous Liquid, Does Not Sustain Combustion, or others, as allowed under 49CFR Hazmat Regulations. Please consult 49CFR Subchapter C to ensure that subsequent shipments comply with these exceptions.

15. REGULATORY INFORMATION

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	No	Yes 5000 LB	Yes
67-64-1	Acetone {2-Propanone}	No	Yes 5000 LB	No
NA	Petroleum Hydrocarbon Mixture (Alkanes and Cycloalkanes)	No	No	No
141-78-6	Acetic acid, ethyl ester {Ethyl acetate}	No	Yes 5000 LB	No
108-88-3	Toluene {Benzene, Methyl-; Toluol}	No	Yes 1000 LB	Yes
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	No	No	Yes-Cat. N230

This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:	[X] Yes [ ] No	Acute (immediate) Health Hazard
	[X] Yes [ ] No	Chronic (delayed) Health Hazard
	[X] Yes [ ] No	Fire Hazard
	[ ] Yes [X] No	Sudden Release of Pressure Hazard
	[ ] Yes [X] No	Reactive Hazard

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
67-56-1	Methanol {Methyl alcohol; Carbinol; Wood alcohol}	CAA HAP,ODC: HAP; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: Yes: RDTox.
67-64-1	Acetone {2-Propanone}	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
NA	Petroleum Hydrocarbon Mixture (Alkanes and Cycloalkanes)	CAA HAP,ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: Yes
141-78-6	Acetic acid, ethyl ester {Ethyl acetate}	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
108-88-3	Toluene {Benzene, Methyl-; Toluol}	CAA HAP,ODC: HAP; CWA NPDES: Yes; TSCA: Yes - Inventory, 8A CAIR; CA PROP.65: Yes: RDTox(F)
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	CAA HAP,ODC: Yes - Cat.; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No

Regulatory Information: This product is regulated by the United States Consumer Product Safety Commission and is subject to certain labeling requirements under the Federal Hazardous Substances Act. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS). The product label also includes other important information, including directions for use, and should always be read in its entirety prior to using the product.

16. OTHER INFORMATION

Revision Date: 05/24/2017

Preparer Name: W.M. Barr EHS Dept (901)775-0100

Additional Information About This Product: No data available.

Company Policy or Disclaimer: The information contained herein is presented in good faith and believed to be accurate as of the effective date shown above. This information is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determination of suitability

and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Any use of this data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.

ThermoFisher SCIENTIFIC

SAFETY DATA SHEET

Creation Date 28-Apr-2009 **Revision Date** 19-Jan-2018 **Revision Number** 6

1. Identification

Product Name **Acetone**

Cat No. : **AC177170000; AC177170010; AC177170025; AC177170050; AC177170100; AC177170250**

CAS-No 67-64-1
Synonyms 2-Propanone

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, spleen, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Causes serious eye irritation
May cause drowsiness or dizziness
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Keep cool
Response
Get medical attention/advice if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Repeated exposure may cause skin dryness or cracking

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Acetone	67-64-1	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Get medical attention if

	symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water.
Most important symptoms and effects	None reasonably foreseeable. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.
Unsuitable Extinguishing Media	Water may be ineffective
Flash Point	-20 °C / -4 °F
Method -	Closed cup
Autoignition Temperature	465 °C / 869 °F
Explosion Limits	
Upper	12.8 vol %
Lower	2.5 vol %
Oxidizing Properties	Not oxidising
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Flammable. Risk of ignition. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO_2) Formaldehyde Methanol
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
Environmental Precautions	Should not be released into the environment.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Ensure adequate ventilation. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Storage Flammables area. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Acetone	TWA: 250 ppm STEL: 500 ppm	(Vacated) TWA: 750 ppm (Vacated) TWA: 1800 mg/m³ (Vacated) STEL: 2400 mg/m³ (Vacated) STEL: 1000 ppm TWA: 1000 ppm TWA: 2400 mg/m³	IDLH: 2500 ppm TWA: 250 ppm TWA: 590 mg/m³	TWA: 1000 ppm TWA: 2400 mg/m³ STEL: 1260 ppm STEL: 3000 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	sweet
Odor Threshold	19.8 ppm
pH	7
Melting Point/Range	-95 °C / -139 °F
Boiling Point/Range	56 °C / 132.8 °F
Flash Point	-20 °C / -4 °F
Method -	Closed cup
Evaporation Rate	5.6 (Butyl Acetate = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.8 vol %
Lower	2.5 vol %
Vapor Pressure	247 mbar @ 20 °C
Vapor Density	2.0
Specific Gravity	0.790
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available

Autoignition Temperature	465 °C / 869 °F
Decomposition Temperature	> 4°C
Viscosity	0.32 mPa.s @ 20 °C
Molecular Formula	C3 H6 O
Molecular Weight	58.08
Refractive index	1.358 - 1.359

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Heat, flames and sparks. Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents, Strong reducing agents, Strong bases, Peroxides, Halogenated compounds, Alkali metals, Amines

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2), Formaldehyde, Methanol

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Acetone	5800 mg/kg (Rat)	> 15800 mg/kg (rabbit) > 7400 mg/kg (rat)	76 mg/l, 4 h, (rat)

Toxicologically Synergistic Products Carbon tetrachloride; Chloroform; Trichloroethylene; Bromodichloromethane; Dibromochloromethane; N-nitrosodimethylamine; 1,1,2-Trichloroethane; Styrene; Acetonitrile, 2,5-Hexanedione; Ethanol; 1,2-Dichlorobenzene

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Acetone	67-64-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Kidney Liver spleen Blood

Aspiration hazard No information available

Symptoms / effects,both acute and Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

delayed May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Acetone	NOEC = 430 mg/l (algae; 96 h)	Oncorhynchus mykiss: LC50 = 5540 mg/l 96h Alburnus alburnus: LC50 = 11000 mg/l 96h Leuciscus idus: LC50 = 11300 mg/L/48h Salmo gairdneri: LC50 = 6100 mg/L/24h	EC50 = 14500 mg/L/15 min	EC50 = 8800 mg/L/48h EC50 = 12700 mg/L/48h EC50 = 12600 mg/L/48h

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

Component	log Pow
Acetone	-0.24

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Acetone - 67-64-1	U002	-

14. Transport information

DOT

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

TDG

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

IATA

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Acetone	X	X	-	200-662-2	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Acetone	5000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Acetone	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Acetone	2000 lb STQ

Other International Regulations

Mexico - Grade Serious risk, Grade 3

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 28-Apr-2009
Revision Date 19-Jan-2018
Print Date 19-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET
Methyl ethyl ketone (MEK)

SDS conform REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex II - EU

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Date issued	19.08.2014

1.1. Product identifier

Product name	Methyl ethyl ketone (MEK)
Chemical name	Methyl ethyl ketone
Synonyms	butan-2-on, 2-butanon, Ethyl methyl ketone
REACH Reg. No.	01-2119457290-43-0000
CAS no.	78-93-3
EC no.	201-159-0
Index no.	606-002-00-3
Article no.	18000000

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/preparation	For the preparation of paints and as a solvent.

1.3. Details of the supplier of the safety data sheet

Manufacturer

Company name	Fred Holmberg & Co AB
Office address	Geijersgatan 8
Postal address	Box 60056
Postcode	S-216 10
City	Limhamn
Country	Sweden
Tel	+46 (0)40 15 79 20
Fax	+46 (0)40 16 22 95
E-mail	info@holmberg.se
Website	http://www.holmberg.se/en/

1.4. Emergency telephone number

Emergency telephone	112 (Europe)

SECTION 2: Hazards identification

2.1. Classification of substance or mixture

Classification according to 67/548/EEC or 1999/45/EC	F; R11 Xi; R36 R66,R67
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	Flam. Liq. 2;H225; Eye Irrit. 2;H319; STOT SE3;H336;

2.2. Label elements

Hazard Pictograms (CLP)



Signal word	Danger
Hazard statements	H225 Highly flammable liquid and vapour. H319 Causes serious eye irritation. H336 May cause drowsiness or dizziness.
Precautionary statements	P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P233 Keep container tightly closed. P243 Take precautionary measures against static discharge. P280 Wear protective gloves/protective clothing/eye protection/face protection. P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P403 + P235 Store in a well-ventilated place. Keep cool.
Supplemental label information	EUH 066 Repeated exposure may cause skin dryness or cracking.

2.3. Other hazards

Other hazards	Not known.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance	Identification	Classification	Contents
Butanone	CAS no.: 78-93-3 EC no.: 201-159-0 Index no.: 606-002-00-3 Synonyms: Butan-2-one	F; R11 Xi; R36 R66 R67 Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336	100 %

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
Skin contact	Remove contaminated clothes and rinse skin thoroughly with water.
Eye contact	Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. To hospital or eye specialist.
Ingestion	NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Do not induce vomiting. Rinse mouth with water. Contact physician if larger quantity has been consumed. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Information for health personnel	Treat Symptomatically. Do not give victim anything to drink if he is unconscious.

4.3. Indication of any immediate medical attention and special treatment needed

Specific details on antidotes	No recommendation given.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.
Improper extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards	HIGHLY FLAMMABLE! Vapours are heavier than air and may spread near ground to sources of ignition. Solvent vapours may form explosive mixtures with air.
Hazardous combustion products	Fire creates: Carbon monoxide (CO). Carbon dioxide (CO_2).

5.3. Advice for firefighters

Fire fighting procedures	No specific fire fighting procedure given.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal protection measures	Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. Ventilate well. Stop leak if possible without risk. Avoid contact with skin and eyes. Do not breathe vapour. For personal protection, see section 8.

6.2. Environmental precautions

Environmental precautionary measures	Avoid discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up

Cleaning method	Dam and absorb spillages with sand, earth or other non-combustible material. Collect spillage in containers, seal securely and deliver for disposal according to local regulations.

6.4. Reference to other sections

Other instructions	Information regarding exposure / personal protection and disposal, see section 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling	Keep away from heat, sparks and open flame. Take precautionary measures against static discharges. Mechanical ventilation may be required.

Protective Safety Measures

Advice on general occupational hygiene	Provide easy access to water supply and eye wash facilities.

7.2. Conditions for safe storage, including any incompatibilities

Storage	Keep away from heat, sparks and open flame. Ground container and transfer equipment to eliminate static electric sparks. Store in a cool and well-ventilated place.

7.3. Specific end use(s)

Specific use(s)	Not entered.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Other Information about threshold limit values	Norske grenseverdier; FOR-2011-12-06-1358 vedlegg 1. Butanon: 8 t.: 75ppm, 220 mg/m3 (2003)

DNEL / PNEC

Method of testing	Contents
DNEL	Group: Worker Exposure route: Dermal

	Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 1161 mg/kg
DNEL	Group: Worker Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 600 mg/m3
DNEL	Group: Consumer Exposure route: Oral Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 31 mg/kg
DNEL	Group: Consumer Exposure route: Dermal Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 412 mg/kg
DNEL	Group: Consumer Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 106 mg/m3
Exposure guidelines	Country of origin: Sverige Limit value type: KTV OEL Short Term Value: 300 mg/m3 Source: Nationella hygieniska gränsvärden, AFS 2005:17
Other Information	NGV, 150 mg/m3 TWA, 200 ppm STEL, 300 ppm

8.2. Exposure controls

Occupational exposure limits	Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of vapours. Protective gloves and goggles are recommended. Provide eyewash, quick drench.

Safety signs



Respiratory protection

Respiratory protection	Respiratory protection must be used if air contamination exceeds acceptable level. Use respiratory equipment with gas filter, type A2.

Hand protection

Hand protection	Use protective gloves. Chemical resistant gloves required for prolonged or repeated contact.

Eye / face protection

Eye protection	Use safety goggles or face shield in case of splash risk.

Skin protection

Skin protection (except hands)	Wear appropriate clothing to prevent any possibility of skin contact.

Hygiene / Environmental

Specific hygiene measures	Wash hands after contact.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Colour	Colourless.
Odour	Characteristic.
Comments, pH (as supplied)	Not relevant.
Melting point/melting range	Value: -86 °C
Boiling point / boiling range	Value: 82 °C
Flash point	Value: -9 °C
Explosion limit	Value: 1,8-11,5 %
Vapour pressure	Value: 12,6 kPa Test temperature: 20 °C
Vapour density	Value: 2,4 Test temperature: 20 °C
Specific gravity	Value: 804-806 kg/m3 Test temperature: 20 °C
Solubility description	Soluble in: Alcohol.
Solubility in water	250 g/l (20 °C)
Partition coefficient: n-octanol/water	Value: 0,3
Spontaneous combustability	Value: 515 °C
Viscosity	Value: 0,42 mPas Test temperature: 20 °C

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity: Heating may cause a fire.

10.2. Chemical stability

Stability: Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions: Not known.

10.4. Conditions to avoid

Conditions to avoid: Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid: Avoid contact with oxidising agents (e.g. nitric acid, peroxides and chromates). Strong acids.

10.6. Hazardous decomposition products

Hazardous decomposition products: Fire creates: Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological Information:

Other toxicological data: Acute Toxicity (Oral LD50): mg/kg (oral rat) > 2000 - ≤ 5000
Acute Toxicity (Inhalation LC50): > 5000 ppm
Acute Toxicity (Dermal LD50): Rabbit mg/kg > 5000

Potential acute effects

Inhalation	In high concentrations, vapours are narcotic and may cause headache, fatigue, dizziness and nausea. Icke klassificerad som aspirationstoxisk (Not classified as asp. tox.)
Skin contact	Prolonged or frequent contact may cause redness, itching, eczema and skin cracking. Defats the skin.
Eye contact	Causes serious eye irritation.
Ingestion	Ingestion of large amounts may cause unconsciousness. However, ingestion may cause nausea, headache, dizziness and intoxication. Ingestion may cause irritation of the gastrointestinal tract, vomiting and diarrhoea. May cause

irritation to the mouth and throat.

Delayed effects / repeated exposure

Sensitisation	Not known.
Chronic effects	None known.

Carcinogenic, Mutagenic or Reprotoxic

Carcinogenicity	Not known.
Mutagenicity	Not known.
Teratogenic properties	Not known.
Reproductive toxicity	Not known.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic, fish	Value: > 100 mg/l Method of testing: LL/EL/IL50
Acute aquatic, algae	Value: > 100 mg/l Method of testing: LL/EL/IL50
Acute aquatic, Daphnia	Value: > 100 mg/l Method of testing: LL/EL/IL50

12.2. Persistence and degradability

Degradation half life	Lättnedbrytbart. 100% bryts ned på 28 dygn OECD 301D.
Comments, BOD	BOD5/COD: 0,66-0,87
Persistence and degradability	Log Pow: 0,61

12.3. Bioaccumulative potential

Bioaccumulative potential	Will not bio-accumulate.

12.4. Mobility in soil

Mobility	The product is water soluble and may spread in water systems.
Surface tension	Value: 24,8 mN/m (20 °C)

12.5. Results of PBT and vPvB assessment

PBT assessment results	This substance is not classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects / Remarks	None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Specify the appropriate methods of disposal	Confirm disposal procedures with environmental engineer and local regulations. Absorb in vermiculite or dry sand and dispose of at a licenced hazardous waste collection point. Liquid components can be disposed of by incineration.
Product classified as hazardous waste	Yes
Packaging classified as hazardous waste	Yes

SECTION 14: Transport information

14.1. UN number

ADR	1193
RID	1193
IMDG	1193
ICAO/IATA	1193

14.2. UN proper shipping name

ADR	METHYL ETHYL KETONE
RID	METHYL ETHYL KETONE

IMDG	METHYL ETHYL KETONE
ICAO/IATA	METHYL ETHYL KETONE

14.3. Transport hazard class(es)

ADR	3
Hazard no.	33
RID	3
ADN	33
IMDG	3
ICAO/IATA	3

14.4. Packing group

ADR	II
RID	II
IMDG	II
ICAO/IATA	II

14.5. Environmental hazards

Comments	Not relevant.

14.6. Special precautions for user

EmS	F-E, S-D

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Ship type required	3
Pollution category	Z

SECTION 15: Regulatory information

EC no.	201-159-0

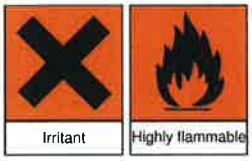
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Other Label Information	Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments.
Legislation and regulations	Dangerous Substance Directive 67/548/EEC. The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716). The List of Wastes (England) (Amendment) Regulations 2005. (SI 2005 No. 895). Avfallsförordningen (2011:927).

15.2. Chemical safety assessment

SECTION 16: Other information

Hazard symbol



R-phrases	R11 Highly flammable. R36 Irritating to eyes. R66 Repeated exposure may cause skin dryness or cracking. R67 Vapours may cause drowsiness and dizziness.
S-phrases	S2 Keep out of the reach of children. S7 Keep container tightly closed. S16 Keep away from sources of ignition - No smoking.
Classification according to	Flam. Liq. 2; H225;

Regulation (EC) No 1272/2008 [CLP/GHS]	Eye Irrit. 2; H319; STOT SE3; H336;
List of relevant R-phrases (under headings 2 and 3).	R36 Irritating to eyes. R11 Highly flammable. R67 Vapours may cause drowsiness and dizziness. R66 Repeated exposure may cause skin dryness or cracking.
List of relevant H-phrases (Section 2 and 3).	H225 Highly flammable liquid and vapour. H336 May cause drowsiness or dizziness. H319 Causes serious eye irritation.
Version	1
Responsible for safety data sheet	Fred Holmberg & Co AB

SAFETY DATA SHEET

Date of issue/Date of revision 6 June 2018

Version 13

Section 1. Identification

Product name : LN-907 LIQUID NAILS EXTREME HEAVY DUTY INTERIOR AND EXTERIOR CONSTRUCTION ADHESIVE

Product code : 00414607

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Industrial applications.

Use of the substance/ mixture : Adhesive.

Uses advised against : Not applicable.

Manufacturer : PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

Emergency telephone number : (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 or + 52 55 5559 1588 (Mexico)

Technical Phone Number : 1-800-441-9695 (8:00 am to 5:00 pm EST)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : CARCINOGENICITY - Category 1A

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 50.1% (Oral), 56.6% (Dermal), 28.3% (Inhalation)

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : May cause cancer.

Precautionary statements

Section 2. Hazards identification

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing.

Response : IF exposed or concerned: Get medical attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Sanding and grinding dusts may be harmful if inhaled. This product contains crystalline silica which can cause lung cancer or silicosis. The risk of cancer depends on the duration and level of exposure to dust from sanding surfaces or mist from spray applications. Emits toxic fumes when heated.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Product name : LN-907 LIQUID NAILS EXTREME HEAVY DUTY INTERIOR AND EXTERIOR CONSTRUCTION ADHESIVE

Ingredient name	%	CAS number
Limestone	≥20 - ≤50	1317-65-3
Kaolin	≥1.0 - ≤5.0	1332-58-7
propane-1,2-diol	≥1.0 - ≤5.0	57-55-6
crystalline silica, respirable powder (>10 microns)	≤1.0	14808-60-7

SUB codes represent substances without registered CAS Numbers.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Description of necessary first aid measures

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Section 4. First aid measures

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon oxides
metal oxide/oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Section 7. Handling and storage

Special precautions : Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Vapors are heavier than air and may spread along floors. If this material is part of a multiple component system, read the Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store below the following temperature: 5°C (41°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Limestone	**OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Kaolin	**ACGIH TLV (United States, 3/2017).** TWA: 2 mg/m³ 8 hours. Form: Respirable fraction **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
propane-1,2-diol	**IPEL (PPG).** TWA: 10 mg/m³
crystalline silica, respirable powder (>10 microns)	**OSHA PEL Z3 (United States, 6/2016).** TWA: 10 mg/m³ / (%SiO2+2) 8 hours. Form: Respirable TWA: 250 mppcf / (%SiO2+5) 8 hours. Form: Respirable **OSHA PEL (United States, 6/2016).** TWA: 50 µg/m³ 8 hours. Form: Respirable dust **ACGIH TLV (United States, 3/2017).** TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction

Key to abbreviations

Section 8. Exposure controls/personal protection

A	= Acceptable Maximum Peak	S	= Potential skin absorption
ACGIH	= American Conference of Governmental Industrial Hygienists.	SR	= Respiratory sensitization
C	= Ceiling Limit	SS	= Skin sensitization
F	= Fume	STEL	= Short term Exposure limit values
IPEL	= Internal Permissible Exposure Limit	TD	= Total dust
OSHA	= Occupational Safety and Health Administration.	TLV	= Threshold Limit Value
R	= Respirable	TWA	= Time Weighted Average
Z	= OSHA 29 CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances		

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety glasses with side shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : For prolonged or repeated handling, use the following type of gloves:

Recommended: nitrile rubber

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : White.

Odor : Characteristic.

Odor threshold : Not available.

pH : 8.2

Melting point : Not available.

Boiling point : 100°C (212°F)

Flash point : Closed cup: Not applicable. [Product does not sustain combustion.]

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Evaporation rate : 0.05 (butyl acetate = 1)

Vapor pressure : 3.3 kPa (25 mm Hg) [room temperature]

Vapor density : Not available.

Relative density : 1.3

Density (lbs / gal) : 10.85

Solubility : Partially soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Viscosity : Kinematic (40°C (104°F)): >0.21 cm^2/s (>21 cSt)

Volatility : 54% (v/v), 41.389% (w/w)

% Solid. (w/w) : 58.611

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Section 10. Stability and reactivity

Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products. Refer to protective measures listed in sections 7 and 8.

Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

Hazardous decomposition products : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Kaolin	LD50 Oral	Rat	>5000 mg/kg	-
propane-1,2-diol	LD50 Dermal	Rabbit	20800 mg/kg	-
	LD50 Oral	Rat	20 g/kg	-

Conclusion/Summary : There are no data available on the mixture itself.

Irritation/Corrosion

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Eyes : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Sensitization

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Mutagenicity

Conclusion/Summary : There are no data available on the mixture itself.

Carcinogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Classification

Product/ingredient name	OSHA	IARC	NTP
crystalline silica, respirable powder (>10 microns)	-	1	Known to be a human carcinogen.

Carcinogen Classification code:

IARC: 1, 2A, 2B, 3, 4
NTP: Known to be a human carcinogen; Reasonably anticipated to be a human carcinogen
OSHA: +
Not listed/not regulated: -

Reproductive toxicity

Conclusion/Summary : There are no data available on the mixture itself.

Section 11. Toxicological information

Teratogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Target organs : Contains material which causes damage to the following organs: eyes. Contains material which may cause damage to the following organs: lungs, upper respiratory tract, skin, stomach.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Conclusion/Summary : There are no data available on the mixture itself. This product contains crystalline silica which can cause lung cancer or silicosis. The risk of cancer depends on the duration and level of exposure to dust from sanding surfaces or mist from spray applications. If splashed in the eyes, the liquid may cause irritation and reversible damage. Ingestion may cause nausea, diarrhea and vomiting. This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.

Short term exposure

Potential immediate effects : There are no data available on the mixture itself.
Potential delayed effects : There are no data available on the mixture itself.

Long term exposure

Potential immediate effects : There are no data available on the mixture itself.
Potential delayed effects : There are no data available on the mixture itself.

Potential chronic health effects

General : No known significant effects or critical hazards.

Section 11. Toxicological information

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
propane-1,2-diol	-0.92	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class (es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Marine pollutant substances	Not applicable.	Not applicable.	Not applicable.

Additional information

DOT : None identified.

IMDG : None identified.

IATA : None identified.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

United States

United States inventory (TSCA 8b) : All components are listed or exempted.

SARA 302/304

SARA 304 RQ : Not applicable.

Composition/information on ingredients

No products were found.

SARA 311/312

Classification : CARCINOGENICITY - Category 1A

Composition/information on ingredients

Name	%	Classification
Crystalline silica, respirable powder (>10 microns)	≤1.0	CARCINOGENICITY - Category 1A

Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

California Prop. 65

⚠ **WARNING**: Cancer - www.P65Warnings.ca.gov.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 1 * **Flammability** : 0 **Physical hazards** : 0

(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on MSDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Health : 1 **Flammability** : 0 **Instability** : 0

Date of previous issue : **1/30/2018**

Organization that prepared the MSDS : EHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

SAFETY DATA SHEET

Date of issue/Date of revision 5 June 2018
Version 7

Section 1. Identification

Product name : LN-2000 LIQUID NAILS FUZE IT
Product code : 00378931
Other means of identification : Not available.
Product type : Solid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Consumer applications, Professional applications.
Use of the substance/ mixture : Adhesive.
Uses advised against : Not applicable.

Manufacturer : PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272
Emergency telephone number : (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 or + 52 55 5559 1588 (Mexico)
Technical Phone Number : 1-800-441-9695 (8:00 am to 5:00 pm EST)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
TOXIC TO REPRODUCTION (Fertility) - Category 1B
TOXIC TO REPRODUCTION (Unborn child) - Category 1B
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 95.4% (Oral), 75.5% (Dermal), 24% (Inhalation)

GHS label elements

Hazard pictograms :



Signal word : Danger

Section 2. Hazards identification

Hazard statements : Causes serious eye irritation.
May cause an allergic skin reaction.
May damage fertility or the unborn child.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid breathing dust. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace.

Response : IF exposed or concerned: Get medical attention. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Trimethoxysilanes are capable of forming methanol if hydrolyzed or ingested. If swallowed, methanol may be harmful or fatal or cause blindness. This product either contains formaldehyde or is capable of releasing formaldehyde above 0.5 ppm under certain conditions. Formaldehyde is a known cancer hazard, a skin sensitizer and a respiratory sensitizer. Emits toxic fumes when heated.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Product name : LN-2000 LIQUID NAILS FUZE IT

Ingredient name	%	CAS number
Limestone	≥50 - ≤75	1317-65-3
proprietary trade secret organic	≥20 - ≤36	Not available.
amide wax	≥1.0 - ≤5.0	Not available.
N-(3-(trimethoxysilyl)propyl)ethylenediamine	≥1.0 - <3.0	1760-24-3
dibutylbis(pentane-2,4-dionato-O,O')tin	<1.0	22673-19-4

SUB codes represent substances without registered CAS Numbers.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Description of necessary first aid measures

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
metal oxide/oxides
Formaldehyde.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Section 6. Accidental release measures

Methods and materials for containment and cleaning up

Small spill : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Special precautions : Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Vapors are heavier than air and may spread along floors. If this material is part of a multiple component system, read the Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 50°C (122°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Limestone	**OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
proprietary trade secret organic	**ACGIH TLV (United States). Absorbed through skin.** TWA: 50 ppm
amide wax	**ACGIH TLV (United States).** TWA: 3 mg/m³ Form: Respirable dust TWA: 10 mg/m³ Form: inhalable dust
N-(3-(trimethoxysilyl)propyl)ethylenediamine	None.
dibutylbis(pentane-2,4-dionato-O,O')tin	**ACGIH TLV (United States). Absorbed through skin.** STEL: 0.2 mg/m³ **OSHA PEL (United States).** TWA: 0.1 mg/m³, (as Sn) TWA: 0.1 mg/m³, (as Sn) Form: Total dust **ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 0.1 mg/m³, (as Sn) 8 hours. STEL: 0.2 mg/m³, (as Sn) 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 0.1 mg/m³, (as Sn) 8 hours.

Key to abbreviations

A	= Acceptable Maximum Peak	S	= Potential skin absorption
ACGIH	= American Conference of Governmental Industrial Hygienists.	SR	= Respiratory sensitization
C	= Ceiling Limit	SS	= Skin sensitization
F	= Fume	STEL	= Short term Exposure limit values
IPEL	= Internal Permissible Exposure Limit	TD	= Total dust
OSHA	= Occupational Safety and Health Administration.	TLV	= Threshold Limit Value
R	= Respirable	TWA	= Time Weighted Average
Z	= OSHA 29 CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances		

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 8. Exposure controls/personal protection

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : butyl rubber

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Section 9. Physical and chemical properties

Appearance

Physical state : Solid.

Color : Gray.

Odor : Characteristic.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: Not applicable. [Product does not sustain combustion.]

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Evaporation rate : Not available.

Vapor pressure : Not available.

Section 9. Physical and chemical properties

Vapor density : Not available.

Relative density : 1.47

Density (lbs / gal) : 12.27

Solubility : Insoluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Viscosity : Kinematic (40°C (104°F)): Not applicable.

Volatility : 1% (v/v), 0.028% (w/w)

% Solid. (w/w) : 99.972

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products. Refer to protective measures listed in sections 7 and 8.

Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

Hazardous decomposition products : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
proprietary trade secret organic	LC50 Inhalation Gas.	Rat	48000 ppm	4 hours
N-(3-(trimethoxysilyl)propyl) ethylenediamine	LD50 Dermal LD50 Oral	Rabbit Rat	3000 mg/kg 2413 mg/kg	- -
dibutylbis(pentane-2, 4-dionato-O,O')tin	LD50 Oral	Rat	>2 g/kg	-

Conclusion/Summary : There are no data available on the mixture itself.

Irritation/Corrosion

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Section 11. Toxicological information

Eyes : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Sensitization

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Mutagenicity

Conclusion/Summary : There are no data available on the mixture itself.

Carcinogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Reproductive toxicity

Conclusion/Summary : There are no data available on the mixture itself.

Teratogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Specific target organ toxicity (single exposure)

Name	Category
dibutylbis(pentane-2,4-dionato-O,O')tin	Category 1

Specific target organ toxicity (repeated exposure)

Name	Category
dibutylbis(pentane-2,4-dionato-O,O')tin	Category 1

Target organs : Contains material which may cause damage to the following organs: lungs, upper respiratory tract, skin, eyes.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Section 11. Toxicological information

Skin contact : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Conclusion/Summary : There are no data available on the mixture itself. Trimethoxysilanes are capable of forming methanol if hydrolyzed or ingested. If swallowed, methanol may be harmful or fatal or cause blindness. This product either contains formaldehyde or is capable of releasing formaldehyde above 0.5 ppm under certain conditions. Formaldehyde is a known cancer hazard, a skin sensitizer and a respiratory sensitizer. Ingestion may cause nausea, diarrhea and vomiting. This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.

Short term exposure

Potential immediate effects : There are no data available on the mixture itself.

Potential delayed effects : There are no data available on the mixture itself.

Long term exposure

Potential immediate effects : There are no data available on the mixture itself.

Potential delayed effects : There are no data available on the mixture itself.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : May damage the unborn child.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : May damage fertility.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	9805.3 mg/kg
Dermal	3496.8 mg/kg
Inhalation (gases)	301670.6 ppm
Inhalation (vapors)	737.4 mg/l
Inhalation (dusts and mists)	100.6 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
amide wax	EC50 29 to 43 mg/l EC50 94 mg/l	Algae Daphnia	72 hours 48 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
amide wax	-	63 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
amide wax	-	-	Readily

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class (es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Marine pollutant substances	Not applicable.	Not applicable.	Not applicable.

Additional information

DOT : None identified.

IMDG : None identified.

IATA : None identified.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

United States

United States inventory (TSCA 8b) : All components are listed or exempted.

SARA 302/304

SARA 304 RQ : Not applicable.

Composition/information on ingredients

No products were found.

SARA 311/312

Classification : EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
TOXIC TO REPRODUCTION (Fertility) - Category 1B
TOXIC TO REPRODUCTION (Unborn child) - Category 1B

Composition/information on ingredients

Section 15. Regulatory information

Name	%	Classification
amide wax	≥1.0 - ≤5.0	COMBUSTIBLE DUSTS SKIN SENSITIZATION - Category 1B
N-(3-(trimethoxysilyl)propyl) ethylenediamine	≥1.0 - <3.0	ACUTE TOXICITY (inhalation) - Category 4 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1B
dibutylbis(pentane-2,4-dionato-O, O')tin	<1.0	ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION - Category 1C SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1B GERM CELL MUTAGENICITY - Category 2 TOXIC TO REPRODUCTION (Fertility) - Category 1B TOXIC TO REPRODUCTION (Unborn child) - Category 1B SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (immune system) (oral) - Category 1

Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 2 * **Flammability** : 0 **Physical hazards** : 0

(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on MSDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Health : 2 **Flammability** : 0 **Instability** : 0

Date of previous issue : **2/7/2018**

Organization that prepared the MSDS : EHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

Section 16. Other information

UN = United Nations

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

SAFETY DATA SHEET

Date of issue/Date of revision **2 September 2018**
Version 9

Section 1. Identification

Product name : LNP-602 LIQUID NAILS SUBFLOOR ADHESIVE
Product code : 00384054
Other means of identification : Not available.
Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Industrial applications.
Use of the substance/ mixture : Adhesive.
Uses advised against : Not applicable.

Manufacturer : PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272
Emergency telephone number : (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 or + 52 55 5559 1588 (Mexico)
Technical Phone Number : 1-800-441-9695 (8:00 am to 5:00 pm EST)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY (dermal) - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN IRRITATION - Category 2
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1A
TOXIC TO REPRODUCTION (Fertility) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (central nervous system (CNS), hearing organs, kidneys, liver) - Category 2
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 44.1% (Oral), 89.5% (Dermal), 69.6% (Inhalation)

Section 2. Hazards identification

This product contains TiO2 which has been classified as a GHS Carcinogen Category 2 based on its IARC 2B classification. For many PPG products, TiO2 is utilized as a raw material in a liquid coating formulation. In this case, the TiO2 particles are bound in a matrix with no meaningful potential for human exposure to unbound particles of TiO2 when the product is applied with a brush or roller. Sanding the coating surface or mist from spray applications may be harmful depending on the duration and level of exposure and require the use of appropriate personal protective equipment and/or engineering controls (see Section 8).

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
Harmful in contact with skin or if inhaled.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
Suspected of damaging fertility.
May cause damage to organs through prolonged or repeated exposure. (central nervous system (CNS), hearing organs, kidneys, liver)

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Wash hands thoroughly after handling.

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Sanding and grinding dusts may be harmful if inhaled. This product contains crystalline silica which can cause lung cancer or silicosis. The risk of cancer depends on the duration and level of exposure to dust from sanding surfaces or mist from spray applications. Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness and nausea and may lead to unconsciousness or death. Avoid contact with skin and clothing. Wash thoroughly after handling. Emits toxic fumes when heated.

Section 2. Hazards identification

Hazards not otherwise classified : Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Product name : LNP-602 LIQUID NAILS SUBFLOOR ADHESIVE

Ingredient name	%	CAS number
Limestone	≥10 - ≤20	1317-65-3
Kaolin	≥10 - ≤20	1332-58-7
Distillates (petroleum), light distillate hydrotreating process, low-boiling	≥10 - ≤20	68410-97-9
cyclohexane	≥5.0 - ≤10	110-82-7
xylene	≥5.0 - ≤7.7	1330-20-7
ethylbenzene	≤1.3	100-41-4
n-hexane	<1.0	110-54-3
titanium dioxide	≤1.0	13463-67-7
crystalline silica, respirable powder (>10 microns)	≤1.0	14808-60-7
cristobalite (<10 microns)	<1.0	14464-46-1
crystalline silica, respirable powder (<10 microns)	<1.0	14808-60-7

SUB codes represent substances without registered CAS Numbers.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Description of necessary first aid measures

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Harmful if inhaled.

Section 4. First aid measures

Skin contact : Harmful in contact with skin. Causes skin irritation. Defatting to the skin.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Section 5. Fire-fighting measures

Specific hazards arising from the chemical : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon oxides
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 6. Accidental release measures

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Special precautions : Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Vapors are heavier than air and may spread along floors. If this material is part of a multiple component system, read the Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 50°C (122°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Limestone	**OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Kaolin	**ACGIH TLV (United States, 3/2017).** TWA: 2 mg/m³ 8 hours. Form: Respirable fraction **OSHA PEL (United States, 6/2016).** TWA: 5 mg/m³ 8 hours. Form: Respirable

Section 8. Exposure controls/personal protection

	fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Distillates (petroleum), light distillate hydrotreating process, low-boiling	**OSHA PEL (United States).** TWA: 500 ppm
cyclohexane	**ACGIH TLV (United States, 3/2017).** TWA: 100 ppm 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 1050 mg/m³ 8 hours. TWA: 300 ppm 8 hours.
xylene	**ACGIH TLV (United States, 3/2017).** STEL: 651 mg/m³ 15 minutes. STEL: 150 ppm 15 minutes. TWA: 434 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
ethylbenzene	**ACGIH TLV (United States, 3/2017).** TWA: 20 ppm 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
n-hexane	**ACGIH TLV (United States, 3/2017).** **Absorbed through skin.** TWA: 50 ppm 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 1800 mg/m³ 8 hours. TWA: 500 ppm 8 hours.
titanium dioxide	**OSHA PEL (United States, 6/2016).** TWA: 15 mg/m³ 8 hours. Form: Total dust **ACGIH TLV (United States, 3/2017).** TWA: 10 mg/m³ 8 hours.
crystalline silica, respirable powder (>10 microns)	**OSHA PEL Z3 (United States, 6/2016).** TWA: 10 mg/m³ / (%SiO2+2) 8 hours. Form: Respirable TWA: 250 mppcf / (%SiO2+5) 8 hours. Form: Respirable **OSHA PEL (United States, 6/2016).** TWA: 50 µg/m³ 8 hours. Form: Respirable dust **ACGIH TLV (United States, 3/2017).** TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction
cristobalite (<10 microns)	**OSHA PEL Z3 (United States, 6/2016).** TWA: 250 mppcf / 2 x (%SiO2+5) 8 hours. Form: Respirable TWA: 10 mg/m³ / 2 x (%SiO2+2) 8 hours. Form: Respirable TWA: 30 mg/m³ / 2 x (%SiO2+2) 8 hours. Form: Total dust **OSHA PEL (United States, 6/2016).** TWA: 50 µg/m³ 8 hours. Form: Respirable

Section 8. Exposure controls/personal protection

	dust **ACGIH TLV (United States, 3/2017).** TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction
crystalline silica, respirable powder (<10 microns)	**ACGIH TLV (United States, 3/2017).** TWA: 0.025 mg/m³ 8 hours. Form: Respirable **OSHA PEL Z3 (United States, 6/2016).** TWA: 10 mg/m³ / (%SiO2+2) 8 hours. Form: Respirable TWA: 250 mppcf / (%SiO2+5) 8 hours. Form: Respirable **OSHA PEL (United States, 6/2016).** TWA: 50 µg/m³ 8 hours. Form: Respirable dust

Key to abbreviations

A	= Acceptable Maximum Peak	S	= Potential skin absorption
ACGIH	= American Conference of Governmental Industrial Hygienists.	SR	= Respiratory sensitization
C	= Ceiling Limit	SS	= Skin sensitization
F	= Fume	STEL	= Short term Exposure limit values
IPEL	= Internal Permissible Exposure Limit	TD	= Total dust
OSHA	= Occupational Safety and Health Administration.	TLV	= Threshold Limit Value
R	= Respirable	TWA	= Time Weighted Average
Z	= OSHA 29 CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances		

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Chemical splash goggles.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : For prolonged or repeated handling, use the following type of gloves:

Not recommended: nitrile rubber
Recommended: polyvinyl alcohol (PVA), Viton®

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Tan.

Odor : Hydrocarbon.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: -17°C (1.4°F)

Material supports combustion. : Yes.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Evaporation rate : 1.5 (butyl acetate = 1)

Vapor pressure : 2.5 kPa (19 mm Hg) [room temperature]

Vapor density : Not available.

Section 9. Physical and chemical properties

Relative density : 1.16

Density (lbs / gal) : 9.68

Solubility : Insoluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Viscosity : Kinematic (40°C (104°F)): >0.21 cm^2/s (>21 cSt)

Volatility : 51% (v/v), 32.743% (w/w)

% Solid. (w/w) : 67.257

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products. Refer to protective measures listed in sections 7 and 8.

Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

Hazardous decomposition products : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Kaolin	LD50 Oral	Rat	>5000 mg/kg	-
Distillates (petroleum), light distillate hydrotreating process, low-boiling	LD50 Oral	Rat	5.17 g/kg	-
cyclohexane	LD50 Oral	Rat	6240 mg/kg	-
xylene	LD50 Dermal	Rabbit	>1.7 g/kg	-
	LD50 Oral	Rat	4.3 g/kg	-
ethylbenzene	LC50 Inhalation Vapor	Rat	17.8 mg/l	4 hours
	LD50 Dermal	Rabbit	17.8 g/kg	-
	LD50 Oral	Rat	3.5 g/kg	-
n-hexane	LC50 Inhalation Gas.	Rat	48000 ppm	4 hours
	LD50 Oral	Rat	15840 mg/kg	-
titanium dioxide	LC50 Inhalation Dusts and mists	Rat	>6.82 mg/l	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-

Section 11. Toxicological information

	LD50 Oral	Rat	>5000 mg/kg	-

Conclusion/Summary : There are no data available on the mixture itself.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
xylene	Skin - Moderate irritant	Rabbit	-	24 hours 500 mg	-

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Eyes : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Sensitization

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Mutagenicity

Conclusion/Summary : There are no data available on the mixture itself.

Carcinogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Classification

Product/ingredient name	OSHA	IARC	NTP
xylene	-	3	-
ethylbenzene	-	2B	-
titanium dioxide	-	2B	-
crystalline silica, respirable powder (>10 microns)	-	1	Known to be a human carcinogen.
cristobalite (<10 microns)	-	1	Known to be a human carcinogen.
crystalline silica, respirable powder (<10 microns)	-	1	Known to be a human carcinogen.

Carcinogen Classification code:

IARC: 1, 2A, 2B, 3, 4
NTP: Known to be a human carcinogen; Reasonably anticipated to be a human carcinogen
OSHA: +
Not listed/not regulated: -

Reproductive toxicity

Conclusion/Summary : There are no data available on the mixture itself.

Teratogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Specific target organ toxicity (single exposure)

Name	Category
cyclohexane	Category 3
xylene	Category 3
n-hexane	Category 3

Specific target organ toxicity (repeated exposure)

Section 11. Toxicological information

Name	Category
cyclohexane	Category 2
xylene	Category 2
ethylbenzene	Category 2
n-hexane	Category 2
cristobalite (<10 microns)	Category 1
crystalline silica, respirable powder (<10 microns)	Category 1

Target organs : Contains material which causes damage to the following organs: brain, central nervous system (CNS).
Contains material which may cause damage to the following organs: kidneys, lungs, the nervous system, liver, cardiovascular system, upper respiratory tract, skin, ears, eye, lens or cornea, stomach.

Aspiration hazard

Name	Result
Distillates (petroleum), light distillate hydrotreating process, low-boiling	ASPIRATION HAZARD - Category 1
cyclohexane	ASPIRATION HAZARD - Category 1
xylene	ASPIRATION HAZARD - Category 1
ethylbenzene	ASPIRATION HAZARD - Category 1
n-hexane	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Harmful if inhaled.

Skin contact : Harmful in contact with skin. Causes skin irritation. Defatting to the skin.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Conclusion/Summary : There are no data available on the mixture itself. This product contains crystalline silica which can cause lung cancer or silicosis. The risk of cancer depends on the duration and level of exposure to dust from sanding surfaces or mist from spray applications. This product contains TiO2 which has been classified as a GHS Carcinogen Category 2 based on its IARC 2B classification. For many PPG products, TiO2 is utilized as a raw material in a liquid coating formulation. In this case, the TiO2 particles are bound in a matrix with no meaningful potential for human exposure to unbound particles of TiO2 when the product is applied with a brush or roller. Sanding the coating surface or mist from spray applications may be harmful depending on the duration and level of exposure and require the use of appropriate personal protective equipment and/or engineering controls (see Section 8). Exposure to component solvent vapor concentrations in excess of the stated occupational exposure limit may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Solvents may cause some of the above effects by absorption through the skin. There is some evidence that repeated exposure to organic solvent vapors in combination with constant loud noise can cause greater hearing loss than expected from exposure to noise alone. If splashed in the eyes, the liquid may cause irritation and reversible damage. Ingestion may cause nausea, diarrhea and vomiting. This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.

Short term exposure

Potential immediate effects : There are no data available on the mixture itself.

Potential delayed effects : There are no data available on the mixture itself.

Long term exposure

Potential immediate effects : There are no data available on the mixture itself.

Potential delayed effects : There are no data available on the mixture itself.

Potential chronic health effects

General : May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : May cause genetic defects.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : Suspected of damaging fertility.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	30595.9 mg/kg
Dermal	1790.3 mg/kg
Inhalation (gases)	18039.9 ppm
Inhalation (vapors)	46.79 mg/l
Inhalation (dusts and mists)	6.013 mg/l

Section 11. Toxicological information

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
ethylbenzene	Acute LC50 150 to 200 mg/l Fresh water	Fish - Lepomis macrochirus - Young of the year	96 hours
titanium dioxide	Acute LC50 >100 mg/l Fresh water	Daphnia - Daphnia magna	48 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
xylene	-	-	Readily
ethylbenzene	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
cyclohexane	3.44	83.18	low
xylene	3.16	7.4 to 18.5	low
ethylbenzene	3.15	79.43	low
n-hexane	3.9	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	IMDG	IATA
UN number	UN1133	UN1133	UN1133
UN proper shipping name	ADHESIVES	ADHESIVES	ADHESIVES
Transport hazard class (es)	3	3	3
Packing group	II	II	II
Environmental hazards	No.	Yes.	Yes. The environmentally hazardous substance mark is not required.
Marine pollutant substances	Not applicable.	(cyclohexane)	Not applicable.
Product RQ (lbs)	1550.5	Not applicable.	Not applicable.
RQ substances	(xylene, cyclohexane)	Not applicable.	Not applicable.

Additional information

DOT : Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

United States

United States inventory (TSCA 8b) : All components are listed or exempted.

United States - TSCA 5(a)2 - Final significant new use rules:

4-nonylphenol, branched	Listed
nonylphenol	Listed

SARA 302/304

SARA 304 RQ : Not applicable.

Composition/information on ingredients

No products were found.

SARA 311/312

Section 15. Regulatory information

Classification : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY (dermal) - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN IRRITATION - Category 2
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1A
TOXIC TO REPRODUCTION (Fertility) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (central nervous system (CNS), hearing organs, kidneys, liver) - Category 2
HNOC - Defatting irritant

Composition/information on ingredients

Name	%	Classification
Distillates (petroleum), light distillate hydrotreating process, low-boiling	≥10 - ≤20	GERM CELL MUTAGENICITY - Category 1B CARCINOGENICITY - Category 1B ASPIRATION HAZARD - Category 1 HNOC - Defatting irritant
cyclohexane	≥5.0 - ≤10	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 ASPIRATION HAZARD - Category 1
xylene	≥5.0 - ≤7.7	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (central nervous system (CNS), kidneys, liver) - Category 2 ASPIRATION HAZARD - Category 1
ethylbenzene	≤1.3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (hearing organs) - Category 2 ASPIRATION HAZARD - Category 1 HNOC - Defatting irritant
n-hexane	<1.0	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 TOXIC TO REPRODUCTION (Fertility) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 ASPIRATION HAZARD - Category 1 HNOC - Defatting irritant
titanium dioxide	≤1.0	CARCINOGENICITY - Category 2
crystalline silica, respirable	≤1.0	CARCINOGENICITY - Category 1A

Section 15. Regulatory information

powder (>10 microns) cristobalite (<10 microns)	<1.0	CARCINOGENICITY - Category 1A SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (inhalation) - Category 1
crystalline silica, respirable powder (<10 microns)	<1.0	CARCINOGENICITY - Category 1A SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (inhalation) - Category 1

SARA 313

Supplier notification :

Chemical name	CAS number	Concentration
cyclohexane	110-82-7	5 - 10
xylene	1330-20-7	3 - 7
ethylbenzene	100-41-4	0.5 - 1.5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

California Prop. 65

⚠ **WARNING**: Cancer - www.P65Warnings.ca.gov.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 2 * **Flammability** : 4 **Physical hazards** : 0

(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on MSDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Health : 2 **Flammability** : 4 **Instability** : 0

Date of previous issue : **5/9/2018**

Organization that prepared the MSDS : EHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

Section 16. Other information

UN = United Nations

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

Acetylene, dissolved in DMF

Safety Data Sheet P-6201

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1987 Revision date: 01/12/2015 Supersedes: 11/01/2008

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Acetylene, dissolved in DMF
CAS No	:	74-86-2
Formula	:	C2H2
Other means of identification	:	Acetylen, ethine, ethyne, narcylene

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	:	Onsite Emergency: 1-800-645-4633 CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Flam. Gas 1 H220
Dissolved gas H280

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02 GHS04

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H220 - EXTREMELY FLAMMABLE GAS
H231 - MAY REACT EXPLOSIVELY EVEN IN THE ABSENCE OF AIR AT ELEVATED PRESSURE AND/OR TEMPERATURE
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR

Precautionary statements (GHS-US) :
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, Open flames, sparks, hot surfaces. - No smoking
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
P501 - Dispose of contents/container in accordance with container supplier/owner instructions
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG13 - Fusible plugs in the top, bottom, or valve melt at 98°C to 107°C (208°F to 224°F). Do not discharge at pressures above 15 psig (103 kPa).
CGA-PG06 - Close valve after each use and when empty.

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CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards not contributing to the classification : For safety reasons, the acetylene is dissolved in dimethylformamide (CAS # 68-12-2; Repr. 1B, Acute Tox. 4, Eye Irrit. 2) in the gas container. Vapor of the solvent is carried away as impurity when the acetylene is extracted from the gas container. The concentration of the solvent vapor in the gas is lower than the concentration limits to change the classification of the acetylene.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name	Product identifier	%
Acetylene, dissolved in DMF (Main constituent)	(CAS No) 74-86-2	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : See below. See CGA Pamphlet SB-4, Handling Acetylene Cylinders in Fire Situations, for further information.

5.2. Special hazards arising from the substance or mixture

Fire hazard : EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

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5.3. Advice for firefighters

Firefighting instructions	:	Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.
Protection during firefighting	:	Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible. Continue water spray from protected position until container stays cool.
Other information	:	Acetylene containers are provided with pressure relief devices designed to vent contents when exposed to elevated temperature.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate ventilation. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Storage area : Acetylene trailers are designed and intended for outdoor use. Acetylene storage in excess of 2.500 cu ft (70.79 cubic meters) is prohibited in buildings and other occupancies.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Acetylene, dissolved in DMF (74-86-2)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear leather safety gloves and safety shoes when handling cylinders.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

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Appearance	:	Colorless, odorless gas.
Molecular mass	:	26 g/mol
Color	:	Colorless.
Odor	:	Garlic like.
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-80.8 °C
Freezing point	:	No data available
Boiling point	:	-84 °C
Flash point	:	No data available
Critical temperature	:	36 °C
Auto-ignition temperature	:	305 °C
Decomposition temperature	:	635 °C
Flammability (solid, gas)	:	2.5 - 100 vol %
Vapor pressure	:	4400 kPa
Critical pressure	:	6138 kPa
Relative vapor density at 20 °C	:	No data available
Relative density	:	Not applicable.
Specific gravity / density	:	0.0012 g/cm³ (at 0 °C)
Relative gas density	:	0.9
Solubility	:	Water: 1185 mg/l
Log Pow	:	0.37
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosive limits	:	No data available

9.2. Other information

Sublimation point	:	-83.3 °C
Gas group	:	Dissolved gas

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Dissolved in a solvent supported in a porous mass. Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

May react explosively even in the absence of air. May decompose violently at high temperature and/or pressure or in the presence of a catalyst. Can form explosive mixture with air. May react violently with oxidants.

10.4. Conditions to avoid

High temperature. High pressure. Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

Forms explosive acetylides with copper, silver and mercury. Do not use alloys containing more than 65% copper. Air, Oxidizer. Do not use alloys containing more than 43% silver.

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10.6. Hazardous decomposition products

Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

No known effects from this product.

Aspiration hazard : Not classified

Not applicable.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Acetylene, dissolved in DMF (74-86-2)	
Persistence and degradability	Will rapidly degrade by indirect photolysis in air. Will not undergo hydrolysis.

12.3. Bioaccumulative potential

Acetylene, dissolved in DMF (74-86-2)	
Log Pow	0.37
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Acetylene, dissolved in DMF (74-86-2)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer : No known effects from this product.

Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

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SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1001 Acetylene, dissolved

UN-No.(DOT) : UN1001

Proper Shipping Name (DOT) : Acetylene, dissolved

Hazard labels (DOT) : 2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : N86 - UN pressure receptacles made of aluminum alloy are not authorized.
N88 - Any metal part of a UN pressure receptacle in contact with the contents may not contain more than 65% copper, with a tolerance of 1%.

Additional information

Emergency Response Guide (ERG) Number : 116 (UN1001)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1001

Proper Shipping Name (IMDG) : Acetylene, dissolved

Class (IMDG) : 2 - Gases

MFAG-No : 116

Air transport

UN-No.(IATA) : 1001

Proper Shipping Name (IATA) : Acetylene, dissolved

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Acetylene, dissolved in DMF (74-86-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Reactive hazard Fire hazard

15.2. International regulations

CANADA

Acetylene, dissolved in DMF (74-86-2)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class F - Dangerously Reactive Material

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EU-Regulations

Acetylene, dissolved in DMF (74-86-2)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Flam. Gas 1 H220
Dissolved gas H280

Full text of H-phrases: see section 16

15.2.2. National regulations

Acetylene, dissolved in DMF (74-86-2)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Acetylene, dissolved in DMF(74-86-2)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date : 1/12/2015 12:00:00 AM

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Other information : When using this product in welding and cutting, read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, Precautions and Safe Practices for Gas Welding, Cutting, and Heating, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society (AWS), www.aws.org. Order AWS documents from Global Engineering Documents, global.ihs.com. Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hotwork. Do not strike an arc on the container. The defect produced by an arc burn may lead to container rupture.

Fumes and gases produced during welding and cutting processes can be dangerous to your health and may cause serious lung disease. KEEP YOUR HEAD OUT OF FUMES. DO NOT BREATHE FUMES AND GASES. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort. Contaminants in the air may add to the hazard of fumes and gases.

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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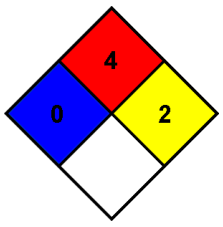
Full text of H-phrases:

Dissolved gas	Gases under pressure Dissolved gas
Flam. Gas 1	Flammable gases Category 1
H220	EXTREMELY FLAMMABLE GAS
H280	CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity : 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.



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HMIS III Rating

Health	: 2 Moderate Hazard - Temporary or minor injury may occur
Flammability	: 4 Severe Hazard
Physical	: 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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Oxygen, compressed

Safety Data Sheet P-4638

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1979 Revision date: 06/23/2015 Supersedes: 05/11/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Oxygen, compressed
CAS No	:	7782-44-7
Formula	:	O2
Other means of identification	:	Oxygen, Compressed; MediPure Oxygen; Aviator's Breathing Oxygen; USP Oxygen; Oxygen - Diving Grade

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Medical applications. Industrial use Diving Gas (Underwater Breathing)

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	:	Onsite Emergency: 1-800-645-4633 CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Ox. Gas 1	H270
Compressed gas	H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS03 GHS04

Signal word (GHS-US)	:	DANGER
Hazard statements (GHS-US)	:	H270 - MAY CAUSE OR INTENSIFY FIRE; OXIDIZER H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
Precautionary statements (GHS-US)	:	P202 - Do not handle until all safety precautions have been read and understood P220 - Keep/Store away from combustible materials, clothing P244 - Keep reduction valves/valves and fittings free from oil and grease P271+P403 - Use and store only outdoors or in a well-ventilated place. P370+P376 - In case of fire: Stop leak if safe to do so CGA-PG05 - Use a back flow preventive device in the piping. CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure. CGA-PG22 - Use only with equipment cleaned for oxygen service. CGA-PG21 - Open valve slowly. CGA-PG06 - Close valve after each use and when empty.

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CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards not contributing to the classification : Breathing 80 percent or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and central nervous system (CNS) effects, resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name : Oxygen, compressed

CAS No : 7782-44-7

Name	Product identifier	%
Oxygen	(CAS No) 7782-44-7	99.5 - 100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Move to fresh air. Get medical advice/attention.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g., safety shower) is the preferred extinguishing media for clothing fires.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion.

5.3. Advice for firefighters

Firefighting instructions : High-pressure, oxidizing gas.

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible.
Other information	:	Heat of fire can build pressure in container and cause it to rupture. Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) No part of the container should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Ensure adequate air ventilation. Eliminate ignition sources. Evacuate area. Try to stop release. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.
Safe use of the product	:	**The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Oxygen, compressed (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

Oxygen (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Avoid oxygen rich (>23.5%) atmospheres. Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 32 g/mol

Color : Colorless.

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Odor	:	No odor warning properties.
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-219 °C (-362°F)
Freezing point	:	No data available
Boiling point	:	-183 °C (-297°F)
Flash point	:	Not applicable.
Critical temperature	:	-118.6 °C (-181.48°F)
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	Not applicable.
Critical pressure	:	50.4 bar (731.4 psia)
Relative vapor density at 20 °C	:	0.0827 lb/ft3 (1.325 kg/m3) absolute vapor density at 70°F/21.1°C, 1 atm
Relative density	:	1.1
Density	:	1.4289 kg/m³ (at 21.1 °C)
Relative gas density	:	1.1
Solubility	:	Water: 39 mg/l
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	Oxidizer.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidizes organic material.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep equipment free from oil and grease. Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion. May react violently with combustible materials. May react violently with reducing agents.

10.6. Hazardous decomposition products

None.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Oxygen, compressed (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Oxygen, compressed (7782-44-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Oxygen, compressed (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on ozone layer : None.

Effect on the global warming : No known effects from this product.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1072 Oxygen, compressed, 2.2

UN-No.(DOT) : UN1072

Proper Shipping Name (DOT) : Oxygen, compressed

Transport hazard class(es) (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas
5.1 - Oxidizer



DOT Special Provisions (49 CFR 172.102) : 110 - Fire extinguishers transported under UN1044 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per extinguishing unit.
A14 - This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with 173.306 of this subchapter when transported aboard an aircraft.

Additional information

Emergency Response Guide (ERG) Number : 122 (UN1072)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1072

Proper Shipping Name (IMDG) : OXYGEN, COMPRESSED

Class (IMDG) : 2 - Gases

MFAG-No : 122

Air transport

UN-No. (IATA) : 1072

Proper Shipping Name (IATA) : Oxygen, compressed

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases nonflammable nontoxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Oxygen, compressed (7782-44-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Fire hazard

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

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This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Oxygen, compressed (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

Oxygen (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Oxygen, compressed (7782-44-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Oxygen, compressed (7782-44-7)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Oxygen, compressed(7782-44-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

Oxygen (7782-44-7)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
No	No	No	No	

Oxygen (7782-44-7)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date : 6/23/2015 12:00:00 AM

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Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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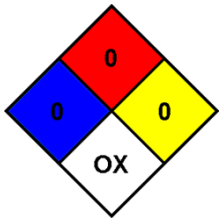
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NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard : OX - This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.



HMIS III Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 0 Minimal Hazard

Physical : 3 Serious Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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Propane

Safety Data Sheet P-4646

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1984 Revision date: 10/24/2016 Supersedes: 01/21/2016

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Propane
CAS No	:	74-98-6
Formula	:	C3H8
Other means of identification	:	Propane, Liquefied Petroleum Gas, n-propane,dimethylmethane,propyl hydride, refrigerant gas R290

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1 H220
Liquefied gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02 GHS04

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) : H220 - **EXTREMELY FLAMMABLE GAS**
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR
CGA-HG01 - MAY CAUSE FROSTBITE

Precautionary statements (GHS-US) : P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking
P271+P403 - Use and store only outdoors or in a well-ventilated place
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG12 - Do not open valve until connected to equipment prepared for use
CGA-PG06 - Close valve after each use and when empty
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles

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CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

2.3. Other hazards

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name	Product identifier	%
Propane (Main constituent)	(CAS No) 74-98-6	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, dry chemical powder, water spray, fog.

5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS**. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : **EXTREMELY FLAMMABLE GAS**. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

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Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems Stop flow of product if safe to do so Use water spray or fog to knock down fire fumes if possible.
Other information	:	Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate air ventilation. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Propane (74-98-6)		
USA OSHA	OSHA PEL (TWA) (mg/m³)	1800 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (mg/m³)	< mg/m³
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
ACGIH	Not established	

8.2. Exposure controls

Appropriate engineering controls : An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder’s gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colorless gas.
Molecular mass	:	44 g/mol
Color	:	Colorless.
Odor	:	Poor warning properties at low concentrations. Stenchant often added. Sweetish.
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	No data available
Freezing point	:	-187.69 °C (-305.8°F)
Boiling point	:	-42.1 °C (-44.32°F)
Flash point	:	-104.4 °C (-155.2°F) TCC
Critical temperature	:	96.8 °C (206°F)
Auto-ignition temperature	:	450 °C (842°F)
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	2.1 - 9.5 vol %
Vapor pressure	:	8.58 bar (109.73 psig)
Relative vapor density at 20 °C	:	No data available
Relative density	:	0.58
Density	:	0.506 - 0.583 g/cm³ (at 15 °C)
Relative gas density	:	1.5
Solubility	:	Water: 75 mg/l
Log Pow	:	2.36
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Liquefied gas
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

Air, Oxidizer. Chlorine dioxide.

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10.6. Hazardous decomposition products

Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Propane (\f)74-98-6	
LC50 inhalation rat (mg/l)	658 mg/l/4h
ATE US (vapors)	658.000 mg/l/4h
ATE US (dust, mist)	658.000 mg/l/4h

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Propane (74-98-6)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

Propane (74-98-6)	
Log Pow	2.36
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Propane (74-98-6)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1978 Propane (see also Petroleum gases, liquefied [UN1075]), 2.1

UN-No.(DOT) : UN1978

Proper Shipping Name (DOT) : Propane

see also Petroleum gases, liquefied [UN1075]

Class (DOT) : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115

Hazard labels (DOT) : 2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : 19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information
T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

Additional information

Emergency Response Guide (ERG) Number : 115 (UN1075)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1978

Proper Shipping Name (IMDG) : PROPANE

Class (IMDG) : 2 - Gases

MFAG-No : 115

Air transport

UN-No. (IATA) : 1978

Proper Shipping Name (IATA) : PROPANE

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Propane (74-98-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Sudden release of pressure hazard Fire hazard

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Propane (74-98-6)
All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.
This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Propane (74-98-6)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Propane (74-98-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Propane (74-98-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

Propane(74-98-6)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

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SECTION 16: Other information

Other information : When using this product in welding and cutting, read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, Precautions and Safe Practices for Gas Welding, Cutting, and Heating, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society (AWS), www.aws.org. Order AWS documents from Global Engineering Documents, global.ihs.com. Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hotwork. Do not strike an arc on the container. The defect produced by an arc burn may lead to container rupture

Fumes and gases produced during welding and cutting processes can be dangerous to your health and may cause serious lung disease. KEEP YOUR HEAD OUT OF FUMES. DO NOT BREATHE FUMES AND GASES. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort. Contaminants in the air may add to the hazard of fumes and gases

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

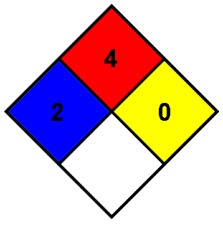
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NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



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HMIS III Rating

Health	: 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	: 4 Severe Hazard
Physical	: 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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Tap Magic Formula 1 Aqueous

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: **Tap Magic Formula 1 Aqueous**

Manufacturer/Supplier Article number: 50016Q, 50128Q, 50640Q, 53840Q, 57040Q

Special Notes on Product uses: After use of this product, clean and lubricate metal surfaces to avoid staining and/or corrosion.
**** Tap Magic Formula 1 Aqueous must not be used for magnesium machining.****

Recommended uses of the product: Machining, Cutting, Tapping, and Metal Processing.

Manufacturer/Supplier Details:
The Steco Corporation
2330 Cantrell Road
Little Rock, AR 72202 USA
Tel: 501-375-5644
Website: www.tapmagic.com
Email: steco@tapmagic.com

Emergency telephone number: ChemTel Inc.: (800)255-3924, +1 (813)248-0585

SECTION 2: Hazards identification

Classification of the substance or mixture:



GHS07: Irritant.
Skin2 H315, Eye2 H319

Signal word: Warning.

Hazard statements:

H315: Causes skin irritation.

H319: Causes serious eye irritation.

Precautionary statements:

P264: Wash hands and exposed skin thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to d

P337+P313: If eye irritation persists get medical advice/attention.

P321: Specific treatment (see Section 4 on this SDS).

P362: Take off contaminated clothing and wash before reuse.

P302+P352: IF ON SKIN: Wash with soap and water.

Hazards Not Otherwise Classified (HNOC): None.

Unknown Acute Toxicity: <0.2% ingredients are of unknown acute toxicity.

NFPA/HMIS



NFPA SCALE (0-4)
Health = 1
Fire = 0
Reactivity = 0

HEALTH	1
FIRE	0
PHYSICAL HAZARD	0

HMIS SCALE (0-4)
Health = 1
Fire = 0
Physical Hazard = 0

0=Minimal Hazard; 1=Slight Hazard; 2=Moderate Hazard; 3=Serious Hazard; 4=Severe Hazard.

SECTION 3: Composition/information on ingredients

Chemical characterization: Mixture.
Description: Machining, cutting, tapping, and metal processing.
Hazardous components:

CAS / Identifying No.	Description	Wt. %
CAS: 39464-70-5	Polyethylene glycol phenyl ether phosphate *Eye1 H318; Skin 2 H315*	1 – 10%
CAS: 102-71-6	Triethanolamine *Eye2 H319,*	1 – 10%
The specific chemical identity has been withheld as a trade secret.	Amine complex trade secret *Sk1B H314; Acute tox 302, 312, 332, , STOT SE3 H335*	1%
CAS: 68551-13-3	Alcohols, C12-15, ethoxylated propoxylated *AcTox H302, H312, Eye2 H319; Aq AcTox1 H400*	1 – 10%

SECTION 4: First aid measures

Description of first aid measures

General information:
Take affected persons into fresh air, if feasible, or away from the source.
Consult a doctor/physician if concerned or feel unwell.
Immediately remove any clothing soiled by the product.
In case of irregular breathing or respiratory arrest, provide artificial respiration.

After inhalation:
Supply fresh air; consult doctor in case of complaints.
If aspirated, seek medical attention immediately.
Provide oxygen treatment if affected person has difficulty breathing.

After skin contact:
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.

After eye contact:
Remove contact lenses if worn.
Rinse opened eye for at least 15 - 20 minutes under running water. If symptoms persist, consult a doctor.

After swallowing:
Rinse out mouth and then drink plenty of water.
Call for medical help immediately.
Do not induce vomiting.
If victim vomits, be sure to keep head below knees to prevent aspiration of vomitus into lungs.
If victim is unconscious, position on their side and support them so they cannot roll onto their back.

Most important symptoms and effects, both acute and delayed:
Breathing difficulty.
Coughing.
Irritant to skin and mucous membranes.
Irritant effect on eyes.
Gastric or intestinal disorders when ingested.

Hazards:
Danger of impaired breathing.
May cause respiratory irritation.

Indication of any immediate medical attention and special treatment needed:
Consult a doctor/physician if concerned or feel unwell.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

Use an extinguishing agent suitable for the surrounding fire.
Foam.
Carbon Dioxide.
Dry Chemical.

For safety reasons unsuitable extinguishing agents: None known.

Special hazards arising from the substance or mixture: Carbon monoxide.

Advice for firefighters

Protective equipment:

Use self-contained breathing apparatus (SCBA) and full bunker turnout gear in a sustained fire.
Wear fully protective suit.

Hazardous Combustion Products:

Carbon oxides.
Nitrogen oxides.

Additional information:

Cool endangered receptacles with water fog or haze.
Use large quantities of foam as it is partially destroyed by the product.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use respiratory protective device against the effects of release.
Wear protective equipment.
Keep unprotected persons away.
Ensure adequate ventilation.
Particular danger of slipping on leaked/spilled product.

Environmental precautions:

For small spills, soak up with shop towels or absorbent material such as oil-dry or vermiculite.
For large spills, any leaks should be stopped.
Spill should be contained, then cleaned up using vacuum truck or absorbent material.

Methods and material for containment and cleaning up:

Absorb with non-combustible liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Pick up mechanically.
Send for recovery or disposal in suitable receptacles.
Dispose contaminated material as waste according to Section 13.

Reference to other sections:

See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

Precautions for safe handling:

Prevent formation of aerosols.
Avoid splashes or spray in enclosed areas.
Use only in well ventilated areas.
Prevent from freezing.
**After use of this product, clean and lubricate metal surfaces to avoid staining and/or corrosion.

Conditions for safe storage, including any incompatibilities

Storage:

Requirements to be met by storerooms and receptacles:

Store only in the original receptacle.

Avoid storage near extreme heat, ignition sources or open flame.

Information about storage in one common storage facility:

Store away from oxidizing agents.

Do not store together with alkalis/caustic solutions.

Store away from foodstuffs.

Further information about storage conditions:

Store in cool, dry conditions in well-sealed containers.

Store receptacle in a well-ventilated area.

Information about fire and explosion protection: No special measures required.

SECTION 8: Exposure controls/personal protection



Safety glasses



Protective gloves

Control Parameters:

Triethanolamine 102-71-6	
ACGIH TLV-TWA	5 mg/m3
Amine complex trade secret	
ACGIH TLV-STEL	6ppm, TLV-TWA 3ppm
NIOSH IDLH	30 ppm, STEL 6ppm 15 mg/m3; TWA 3 ppm 8mg/m3
OSHA PEL TWA	3ppm 6mg/m3

Exposure controls:

General protective and hygienic measures:

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

Do not inhale gases / fumes / aerosols.

Respiratory protection:

Not required under normal conditions of use.

Use suitable respiratory protective device when aerosol or mist is formed.

Use suitable respiratory protective device in case of insufficient ventilation.

Use respiratory protection when grinding or cutting material.

For spills, respiratory protection may be advisable.

Protection of hands:

Protective gloves should be worn. The glove material has to be impermeable and resistant to the product. Selection of the glove material should be based on the penetration time, rates of diffusion and the degradation of the glove material. The exact break through time has to be determined by the manufacturer of the protective gloves.

Eye protection:

Contact lenses should not be worn.

Body protection:

Protective work clothing.

SECTION 9: Physical and chemical properties

Appearance		**Explosion limit**	
Physical state:	Liquid.	**Lower:**	Not determined.
Color:	Amber.	**Upper:**	Not determined.
Odor:	Mild.	**Vapor pressure:**	Not determined.
Odor threshold:	Not determined.	**Vapor density:**	Not Determined.
pH-value:	9.3	**Density:**	1.0 g/ml
Melting/Freezing point:	32° F	**Solubility:**	100% soluble in water. Insoluble in Hydrocarbons.
Boiling point/Boiling range:	Not determined.	**Partition coefficient (n-octanol/water):**	Not determined.
Flash point (closed cup):	Not applicable.	**Auto -ignition temperature:**	Not determined.
Evaporation rate:	Not determined.	**Decomposition temperature:**	Not determined.
Flammability (solid, gaseous):	Non-flammable.		
Viscosity:	6.5 cSt @ 100° F		

Non-standard parameters: None noted.

SECTION 10: Stability and reactivity

Reactivity: Not determined

Chemical stability:

Stable at ambient temperatures and pressure.
Elevated temperature and exposure to strong alkalis, oxidizers, and/or acids will promote decomposition.
Such decomposition results in the release of hydrogen chloride, hydrogen sulfide, and sulfur from the product.
At normal room temperatures, decomposition is virtually nil.
Exposure to strong direct sunlight may cause decomposition and discoloration of some components present in this product.

Possible hazardous reactions:

Reacts with strong oxidizing agents.
Reacts with strong acids and alkali.
Toxic fumes may be released if heated above the decomposition point.

Conditions to avoid: Store away from oxidizing agents.

Incompatible materials:

Contact with alkali materials.
Oxidizers.
Acids.
Magnesium alloys.

Hazardous decomposition products:

Carbon monoxide.
Carbon dioxide.
Phosphorus compounds.
Nitrogen oxides (NOx).

SECTION 11: Toxicological information

Acute Toxicity: The product is not classified as Acutely Toxic, although some of the ingredients are.

Triethanolamine 102-71-6
Dermal LD50 Rabbit >20 mg/kg

Amine complex trade secret
Dermal LD50 Rabbit 1000 mg/kg; Oral LD50 Rat 1720 mg/kg.

Alcohols, C12-15, ethoxylated propoxylated 68551-13-3
Dermal LD50 Rat 2000 mg/kg; Oral LD50 Rat 1350 mg/kg

Routes of Entry: Inhalation, Ingestion, Skin, Eye.

Other Acute effects (irritation and corrosivity): Irritant to skin, eyes, mucous membranes and tissues at each route of entry.

Chronic Effects on Humans: None known.

Mutagenicity: None known.

Carcinogenicity: None known.

Reproductive Effects: None known.

Other Effects on Humans: Hazardous in case of ingestion or inhalation above the PEL without respiratory protection.

SECTION 12: Ecological information

Information on Ecotoxicological effects:

Toxicity: No additional information.

Aquatic toxicity: The material is not classified as being harmful to the environment.

Repeated dose toxicity: None known.

Persistence and degradability: The biodegradability has not been determined for the product; it is aqueous based.

Bioaccumulative potential: No additional information.

Ecotoxical effects: No additional information.

Mobility in soil: Aqueous base is mobile in soil.

General notes: Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Other adverse effects: No additional information.

SECTION 13: Disposal considerations

Waste treatment methods

Recommendation:

Product/containers must NOT be disposed together with household garbage.

Do not allow product to reach sewage system.

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non-hazardous wastes.

Suitable absorbents include natural minerals (clay), activated charcoal, man-made polymers (HD polyethylene).

Uncleaned packaging:

Recommendation: Disposal must be made in accordance with all local, state and federal regulations.

Component Waste Numbers:

No EPA Waste Numbers are applicable for this product's components.

SECTION 14: Transport information

US DOT Transportation Information

Proper shipping name:

DOT, ADR, IMDG, IATA: Not Regulated.

UN-Number:

DOT, ADR, IMDG, IATA: Not Regulated.

Packing group:

DOT, ADR, IMDG, IATA: Not Regulated.

Transport hazard class(es):

Class: Not Regulated.

Label: None.

Environmental hazards:

Marine pollutant: No.

Special precautions for user: Not applicable.

SECTION 15: Regulatory information

United States (USA)

General Product Information: No additional information available.

Component Analysis: No additional information available.

The following is provided to aide in the preparation of SARA 311 and 312 reports.

SARA 311/312

Acute Health Hazard: Yes
Chronic Health Hazard: No
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactive Hazard: No

TSCA (Toxic Substances Control Act): All ingredients are listed.

Clean Air Act: None of the ingredient is listed.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for females: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for males: None of the ingredient is listed.
Chemicals known to cause developmental toxicity: None of the ingredient is listed.

Canada

Canadian Domestic Substances List (DSL): All ingredients are listed.
Canadian Ingredient Disclosure list (limit 0.1%): None of the ingredients is listed.
Canadian Ingredient Disclosure list (limit 1%):
Amine complex trade secret
Triethanolamine 102-71-6

SECTION 16: Other information

Effective date: 11/20/2014 **US Only (GHS) Version**

This information is based on our present knowledge according to 29 CFR 1910/1200 and GHS Rev 3. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent

This SDS applies to part numbers: 50016Q, 50128Q, 50640Q, 53840Q, 57040Q

LD50: Lethal dose, 50 percent
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

Special Note: Tap Magic Formula 1 Aqueous must not be used for magnesium machining.

Tap Magic SDSs are available at www.tapmagic.com
Document Group: "Formula_1_Aqueous_USA_EN_Rev0"

SDS Created by:
Global Safety Management, Inc.
10006 Cross Creek Blvd
Tampa, FL, 33647
Tel: 1-844-GSM-INFO (1-844-476-4636)
Website: www.GSMSDS.com

ThermoFisher SCIENTIFIC

SAFETY DATA SHEET

Creation Date 28-Apr-2009 **Revision Date** 19-Jan-2018 **Revision Number** 6

1. Identification

Product Name **Acetone**

Cat No. : **AC177170000; AC177170010; AC177170025; AC177170050; AC177170100; AC177170250**

CAS-No 67-64-1
Synonyms 2-Propanone

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, spleen, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Causes serious eye irritation
May cause drowsiness or dizziness
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Keep cool
Response
Get medical attention/advice if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Repeated exposure may cause skin dryness or cracking

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Acetone	67-64-1	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Get medical attention if

	symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water.
Most important symptoms and effects	None reasonably foreseeable. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.
Unsuitable Extinguishing Media	Water may be ineffective
Flash Point	-20 °C / -4 °F
Method -	Closed cup
Autoignition Temperature	465 °C / 869 °F
Explosion Limits	
Upper	12.8 vol %
Lower	2.5 vol %
Oxidizing Properties	Not oxidising
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Flammable. Risk of ignition. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO_2) Formaldehyde Methanol
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
Environmental Precautions	Should not be released into the environment.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Ensure adequate ventilation. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Storage Flammables area. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Acetone	TWA: 250 ppm STEL: 500 ppm	(Vacated) TWA: 750 ppm (Vacated) TWA: 1800 mg/m³ (Vacated) STEL: 2400 mg/m³ (Vacated) STEL: 1000 ppm TWA: 1000 ppm TWA: 2400 mg/m³	IDLH: 2500 ppm TWA: 250 ppm TWA: 590 mg/m³	TWA: 1000 ppm TWA: 2400 mg/m³ STEL: 1260 ppm STEL: 3000 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	sweet
Odor Threshold	19.8 ppm
pH	7
Melting Point/Range	-95 °C / -139 °F
Boiling Point/Range	56 °C / 132.8 °F
Flash Point	-20 °C / -4 °F
Method -	Closed cup
Evaporation Rate	5.6 (Butyl Acetate = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.8 vol %
Lower	2.5 vol %
Vapor Pressure	247 mbar @ 20 °C
Vapor Density	2.0
Specific Gravity	0.790
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available

Autoignition Temperature	465 °C / 869 °F
Decomposition Temperature	> 4°C
Viscosity	0.32 mPa.s @ 20 °C
Molecular Formula	C3 H6 O
Molecular Weight	58.08
Refractive Index	1.358 - 1.359

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Heat, flames and sparks. Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents, Strong reducing agents, Strong bases, Peroxides, Halogenated compounds, Alkali metals, Amines

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2), Formaldehyde, Methanol

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Acetone	5800 mg/kg (Rat)	> 15800 mg/kg (rabbit) > 7400 mg/kg (rat)	76 mg/l, 4 h, (rat)

Toxicologically Synergistic Products Carbon tetrachloride; Chloroform; Trichloroethylene; Bromodichloromethane; Dibromochloromethane; N-nitrosodimethylamine; 1,1,2-Trichloroethane; Styrene; Acetonitrile, 2,5-Hexanedione; Ethanol; 1,2-Dichlorobenzene

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Acetone	67-64-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Kidney Liver spleen Blood

Aspiration hazard No information available

Symptoms / effects,both acute and Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting:

delayed May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

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Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Acetone	NOEC = 430 mg/l (algae; 96 h)	Oncorhynchus mykiss: LC50 = 5540 mg/l 96h Alburnus alburnus: LC50 = 11000 mg/l 96h Leuciscus idus: LC50 = 11300 mg/L/48h Salmo gairdneri: LC50 = 6100 mg/L/24h	EC50 = 14500 mg/L/15 min	EC50 = 8800 mg/L/48h EC50 = 12700 mg/L/48h EC50 = 12600 mg/L/48h

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

Component	log Pow
Acetone	-0.24

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Acetone - 67-64-1	U002	-

14. Transport information

DOT

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

TDG

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

IATA

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No UN1090
Proper Shipping Name ACETONE
Hazard Class 3
Packing Group II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Acetone	X	X	-	200-662-2	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Acetone	5000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Acetone	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Acetone	2000 lb STQ

Other International Regulations

Mexico - Grade Serious risk, Grade 3

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 28-Apr-2009
Revision Date 19-Jan-2018
Print Date 19-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

U.S. SILICA COMPANY
SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier: Silica Sand, Ground Silica, and Fine Ground Silica

Product Name/Trade Names:
Sand and Ground Silica Sand (sold under various names: ASTM TESTING SANDS • GLASS SAND • FILPRO® · FLINT SILICA • DM-SERIES • F-SERIES • FOUNDRY SANDS • FJ-SERIES H-SERIES • L-SERIES • N-SERIES • NJ SERIES • OK-SERIES • P-SERIES • T-SERIES • hydraulic fracturing sand, all sizes • frac sand, all sizes • MIN-U-SIL® Fine Ground Silica • MYSTIC WHITE II® • #1 DRY • #1 SPECIAL • PENN SAND® • PRO WHITE® · SILURIAN® · Q-ROK® • SIL-CO-SIL® Ground Silica • MICROSIL® • SUPERSIL® • MASON SAND • GS SERIES • PERSPEC • proppant, all sizes • SHALE FRAC® - SERIES • KOSSE WHITE® • OTTAWA WHITE® • OPTIJUMP® • LIGHTHOUSE™• MICRO STIM™• MICRO STIM PLUS™

Chemical Name or Synonym:
Crystalline Silica (Quartz), Sand, Silica Sand, Flint, Ground Silica, Fine Ground Silica, Silica Flour.

Recommended use of the chemical and restrictions on use: (non-exhaustive list): brick, ceramics, foundry castings, glass, grout, hydraulic fracturing sand, frac sand, proppant, mortar, paint and coatings, silicate chemistry, silicone rubber, thermoset plastics.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Manufacturer:
U.S. Silica Company
8490 Progress Drive, Suite 300
Frederick, MD 21701
U.S.A.

Phone: 800-243-7500
Emergency Phone: 301-682-0600
Fax: 301-682-0690

2. HAZARD(S) IDENTIFICATION

Classification:

Physical	Health
Not Hazardous	Carcinogen Category 1A Specific Target Organ Toxicity – Repeated Exposure Category 1



DANGER
May cause cancer by inhalation.
Causes damage to lungs through prolonged or repeated exposure by inhalation.
Response:
If exposed or concerned: Get medical advice.
Disposal:
Dispose of contents/containers in accordance with local regulation.

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Do not eat, drink or smoke when using this product.
Wear protective gloves and safety glasses or goggles.
In case of inadequate ventilation wear respiratory protection.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	Percent
Crystalline Silica (quartz)	14808-60-7	95-99.9

4. FIRST-AID MEASURES

Inhalation: First aid is not generally required. If irritation develops from breathing dust, move the person from the overexposure and seek medical attention if needed.
Skin contact: First aid is not required.
Eye contact: Wash immediately with plenty of water. Do not rub eyes. If irritation persists, seek medical attention.
Ingestion: First aid is not required.
Most important symptoms/effects, acute and delayed: Particulates may cause abrasive eye injury. Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer.
Indication of immediate medical attention and special treatment, if necessary: Immediate medical attention is not required.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media: Use extinguishing media appropriate for surrounding fire.

Specific hazards arising from the chemical: Product is not flammable, combustible or explosive.

Special protective equipment and precautions for fire-fighters: None required.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Wear appropriate protective clothing and respiratory protection (see Section 8). Avoid generating airborne dust during clean-up.

Environmental precautions: No specific precautions. Report releases to regulatory authorities if required by local, state and federal regulations.

Methods and materials for containment and cleaning up: Avoid dry sweeping. Do not use compressed air to clean spilled sand or ground silica. Use water spraying/flushing or ventilated/HEPA filtered vacuum cleaning system. Wet before sweeping. Dispose of in closed containers.

7. HANDLING AND STORAGE

Precautions for safe handling:
Avoid generating dust. Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Respirable crystalline silica dust may be in the air without a visible dust cloud. Use adequate exhaust ventilation and dust collection to reduce respirable crystalline silica dust levels to below the permissible exposure limit ("PEL"). Maintain and test ventilation and dust collection equipment. Use all available work practices to control

dust exposures, such as water sprays. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Keep airborne dust concentrations below permissible exposure limits.

Where necessary to reduce exposures below the PEL or other applicable limit (if lower than the PEL), wear a respirator approved for silica containing dust when using, handling, storing or disposing of this product or bag. See Section 8, for further information on respirators. Do not alter the respirator. Do not wear a tight-fitting respirator with facial hair such as a beard or mustache that prevents a good seal between the respirator and face. Maintain, clean, and fit test respirators in accordance with applicable standards. Wash or vacuum clothing that has become dusty.

Participate in training, exposure monitoring, and health surveillance programs to monitor any potential adverse health effects that may be caused by breathing respirable crystalline silica. The OSHA Respirable Crystalline Silica Standards; 29CFR1910.1053, 1915.1053 and 1926.1053, the OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.1200, 1917.28, 1918.90, 1926.59 and 1928.21, and state and local worker or community "right-to-know" laws and regulations should be strictly followed.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Conditions for safe storage, including any incompatibilities: Use dust collection to trap dust produced during loading and unloading. Keep containers closed and store bags to avoid accidental tearing, breaking, or bursting.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure guidelines:

Until Effective Date of New OSHA PEL below:

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Crystalline Silica (quartz)	10 mg/m3 %SiO_2 + 2 TWA (respirable dust) 30 mg/m3 %SiO_2 + 2 TWA (total dust)	0.025 mg/m3 TWA (respirable dust)	0.05 mg/m3 TWA (respirable dust)

If crystalline silica (quartz) is heated to more than 870°C, quartz can change to a form of crystalline silica known as tridymite; if crystalline silica (quartz) is heated to more than 1470°C, quartz can change to a form of crystalline silica known as cristobalite. The OSHA PEL for crystalline silica as tridymite or cristobalite is one-half of the OSHA PEL for crystalline silica (quartz).

New OSHA PEL from 2016 Respirable Crystalline Silica Standard – see Effective Dates below.

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Crystalline Silica (quartz, cristobalite and tridymite)	0.05 mg/m3 TWA (respirable dust)	0.025 mg/m3 TWA (respirable dust)	0.05 mg/m3 TWA (respirable dust)

Effective Dates: Construction 29CFR 1926.1153 Effective June 23, 2017
General Industry and Maritime 29CFR 1910.1053 / 1915.1053 Effective June 23, 2018
Oil and Gas including Hydraulic Fracturing 29CFR 1910.1053 Effective June 23, 2018

Appropriate engineering controls: Use adequate general or local exhaust ventilation to maintain concentrations in the workplace below the applicable exposure limits listed above.

Respiratory protection: If it is not possible to reduce airborne exposure levels to below the OSHA PEL or other applicable limit with ventilation, use the table below to assist you in selecting respirators that will reduce personal exposures to below the OSHA PEL. This table is part of the OSHA Respirator Standard 29CFR1910.134(d). ***Assigned protection factor (APF)*** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by the Standard. For example, an APF of 10 means that the respirator should reduce the airborne concentration of a particulate by a factor of 10, so that if the workplace concentration of a particulate was 150 ug/m3, then a respirator with an APF of 10 should reduce the concentration of particulate to 15 ug/m3. In additional a cartridge change-out schedule must be developed based on the concentrations in the workplace.

1. -- Assigned Protection Factors[5]

Type of respirator[1], [2]	Quarter mask	Half mask	Full facepiece	Helmet/ hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	[3]10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR)	.....	50	1,000	[4]25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	.....	10	50	.....	.....
• Continuous flow mode	.....	50	1,000	[4]25/1,000	25
• Pressure-demand or other positive-pressure mode	.....	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	.....	10	50	50	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	.....	10,000	10,000	.....

Notes:

[1]Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2]The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3]This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4]The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5]These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

Skin protection: Maintain good industrial hygiene. Protection recommended for workers suffering from dermatitis or sensitive skin.

Eye protection: Safety glasses with side shields or goggles recommended if eye contact is anticipated.

Other: None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.): White or tan sand: granular, crushed or ground to a powder.
Odor: None.

Odor threshold: Not determined	**pH:** 6-8
Melting point/freezing point: 3110°F/1710°C	**Boiling point/range:** 4046°F/2230°C
Flash point: Not applicable	**Evaporation rate:** Not applicable
Flammable limits: LEL: Not applicable	**UEL:** Not applicable
Vapor pressure: Not applicable	**Vapor density:** Not applicable
Relative density: 2.65	**Solubility(ies):** Insoluble in water
Partition coefficient: n-octanol/water: Not applicable	**Auto-ignition temperature:** Not determined
Decomposition temperature: Not determined	**Viscosity:** Not applicable
Flammability (solid, gas): Not applicable	

10. STABILITY AND REACTIVITY

Reactivity: Not reactive under normal conditions of use.
Chemical stability: Stable.
Possibility of hazardous reactions: Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires.
Conditions to avoid: Avoid generation of dust in handling and use.
Incompatible materials: Powerful oxidizers such as fluorine, chlorine trifluoride, and oxygen difluoride and hydrofluoric acid.
Hazardous decomposition products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafluoride.

11. TOXICOLOGICAL INFORMATION

Acute effects of exposure:
Inhalation: Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath.
Ingestion: Ingestion in an unlikely route of exposure. If dust is swallowed, it may irritate the mouth and throat.
Skin contact: No adverse effects are expected.
Eye contact: Particulates may cause abrasive injury.

Chronic effects: Prolonged inhalation of respirable crystalline silica may cause lung disease, silicosis, lung cancer and other effects as indicated below.

The method of exposure that can lead to the adverse health effects described below is inhalation.

A. SILICOSIS
Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute:

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years (10 to 20 or more) of prolonged repeated inhalation of relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Complicated silicosis or PMF symptoms, if present, are shortness of breath and cough. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

Accelerated Silicosis can occur with prolonged repeated inhalation of high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of initial exposure. Progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that lung lesions appear earlier and progression is more rapid.

Acute Silicosis can occur after the repeated inhalation of very high concentrations of respirable crystalline silica over a short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough, weakness and weight loss. Acute silicosis is fatal.

B. CANCER
IARC - The International Agency for Research on Cancer ("IARC") concluded that "crystalline silica in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)"*. For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C,"A Review of Human Carcinogens: Arsenic, Metals, Fibres and Dusts " (2011).

NTP classifies "Silica, Crystalline (respirable size)" as Known to be a human carcinogen.

C. AUTOIMMUNE DISEASES
Several studies have reported excess cases of several autoimmune disorders -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis -- among silica-exposed workers.

D. TUBERCULOSIS
Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to tuberculosis bacteria. Individuals with chronic silicosis have a three-fold higher risk of contracting tuberculosis than similar individuals without silicosis.

E. KIDNEY DISEASE
Several studies have reported excess cases of kidney diseases, including end stage renal disease, among silica-exposed workers. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis", Nephron, Volume 85, pp. 14-19 (2000).

F. NON-MALIGNANT RESPIRATORY DISEASES

The reader is referred to Section 3.5 of the NIOSH Special Hazard Review cited below for information concerning the association between exposure to crystalline silica and chronic bronchitis, emphysema and small airways disease. There are studies that disclose an association between dusts found in various mining occupations and non-malignant respiratory diseases, particularly among smokers. It is unclear whether the observed associations exist only with underlying silicosis, only among smokers, or result from exposure to mineral dusts generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

Sources of information:
The ***NIOSH Hazard Review - Occupational Effects of Occupational Exposure to Respirable Crystalline Silica*** published in April 2002 summarizes and discusses the medical and epidemiological literature on the health risks and diseases associated with occupational exposures to respirable crystalline silica. The *NIOSH Hazard Review* is available from NIOSH - Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226, or through the NIOSH web site, www.cdc.gov/niosh/topics/silica, then click on the link "NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica".

For a more recent review of the health effects of respirable crystalline silica, the reader may consult *Fishman's Pulmonary Diseases and Disorders*, Fourth Edition, Chapter 57. "Coal Workers' Lung Diseases and Silicosis".

The US Occupational Safety and Health Administration (OSHA) published a summary of respirable crystalline silica health effects in connection with OSHA's Proposed Rule regarding occupational exposure to respirable crystalline silica. The summary was published in the September 12, 2013 Federal Register, which can be found at www.federalregister.gov/articles/2013/09/12/2013-20997/occupational-exposure-to-respirable-crystalline-silica.

Numerical measures of toxicity:
Crystalline Silica (quartz): LD50 oral rat >22,500 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity: Crystalline silica (quartz) is not known to be ecotoxic.
Persistence and degradability: Silica is not degradable.
Bioaccumulative potential: Silica is not bioaccumulative.
Mobility in soil: Silica is not mobile in soil.
Other adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in full compliance with national regulations.

14. TRANSPORT INFORMATION

UN number: None
UN proper shipping name: Not regulated
Transport hazard classes(es): None
Packing group, if applicable: None
Environmental hazards: None

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not determined
Special precautions: None known.

15. REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

TSCA Status: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

RCRA: This product is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

Emergency Planning and Community Right to Know Act (SARA Title III): This product contains the following chemicals subject to SARA 302 or SARA 313 reporting: None above the de minimus concentrations.

Clean Air Act: Crystalline silica (quartz) mined and processed by U.S. Silica Company is not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

California Proposition 65: Crystalline silica (airborne particles of respirable size) is classified as a substance known to the State of California to be a carcinogen.

California Inhalation Reference Exposure Level (REL): California established a chronic non-cancer effect REL of 3 μg for silica (crystalline, respirable). A chronic REL is an airborne level of a substance at or below which no non-cancer health effects are anticipated in individuals indefinitely exposed to the substance at that level.

Massachusetts Toxic Use Reduction Act: Silica, crystalline (respirable size, <10 microns) is "toxic" for purposes of the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is a hazardous substance under the Act, but it is not a special hazardous substance or an environmental hazardous substance.

Texas Commission on Environmental Quality: The Texas CEQ has established chronic and acute Reference Values and short term and long term Effects Screening Levels for crystalline silica (quartz). The information can be accessed through www.tceq.texas.gov.

CANADA

Domestic Substances List: U. S. Silica Company products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification: D2A

OTHER NATIONAL INVENTORIES

Australian Inventory of Chemical Substances (AICS): All of the components of this product are

listed on the AICS inventory or exempt from notification requirements.

China: Silica is listed on the IECSC inventory or exempt from notification requirements.

Japan Ministry of International Trade and Industry (MITI): All of the components of this product are existing chemical substances as defined in the Chemical Substance Control Law Registry Number 1-548.

Korea Existing Chemicals Inventory (KECI) (set up under the Toxic Chemical Control Law): Listed on the ECL with registry number 9212-5667.

New Zealand: Silica is listed on the HSNO inventory or exempt from notification requirements.

Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed for PICCS.

Taiwan: Silica is listed on the CSNN inventory or exempt from notification requirements.

16. OTHER INFORMATION

Date of preparation/revision: August 22, 2016

Hazardous Material Information System (HMIS):

Health *
Flammability 0
Physical Hazard 0
Protective Equipment E
* For further information on health effects, see Sections 2, 8 and 11 of this MSDS.

National Fire Protection Association (NFPA):

Health 0
Flammability 0
Instability 0

Web Sites with Information about Effects of Crystalline Silica Exposure:

The U. S. Silica Company web site will provide updated links to OSHA and NIOSH web sites addressing crystalline silica issues: www.ussilica.com, click on "Info Center", then click on "Health & Safety".

The Occupational Safety and Health Administration (OSHA) web site contains information on the OSHA standard related to respirable crystalline silica at https://www.osha.gov/silica/index.html.

The U.S. National Institute for Occupational Safety and Health (NIOSH) maintains a site with information about crystalline silica and its potential health effects at http://www.cdc.gov/niosh/topics/silica.

The IARC Monograph that includes crystalline silica, Volume 100C, can be accessed in PDF form at the IARC web site, http://monographs.iarc.fr/ENG/Monographs/PDFs/index.php.

U. S. Silica Company Disclaimer

The information and recommendations contained herein are based upon data believed to be up to-date and correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any

harmful effects that may be caused by purchase, resale, use or exposure to our silica. Customers and users of silica must comply with all applicable health and safety laws, regulations, and orders. In particular, they are under an obligation to carry out a risk assessment for the particular work places and to take adequate risk management measures in accordance with the national implementation legislation of EU Directives 89/391 and 98/24.

Mineral Spirits Regular

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 12/15/2015 Revision date: 12/15/2015 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form : Substance

Substance name : Mineral Spirits Regular

CAS No : 8052-41-3

Synonyms : Low boiling point naphtha - unspecified / stoddard solvent/ Ligroin/ Petroleum Spirits/ Petroleum Naphtha/ Petroleum Distillates/ Dearomatized Hydrocarbons, VARSOL™/ Paint Thinner-Mineral Spirits

1.2. Relevant identified uses of the substance or mixture and uses advised against

Consumer Product

1.3. Details of the supplier of the safety data sheet

Atlanta Branch Office	Ocoee Branch Office	Spartanburg Branch Office
Whitaker Oil Company	Whitaker Oil Company	Whitaker Chemicals LLC
1557 Marietta Road NW	280 Enterprise Street	405 John Dodd Road
Atlanta, GA 30318	Ocoee, FL 34761	Spartanburg, SC 29303
404-355-8220 (t)	407-656.0088 (t)	864-578-6968 (t)
404-355-2436 (f)	407-877-8335 (f)	864-578-6864 (f)

WEBSITE: www.whitakeroil.com **EMAIL:** SDS@whitakeroil.com

1.4. Emergency telephone number

Emergency number : **CHEMTREC** (800)-424-9300

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Liq. 3	H226 - Flammable liquid and vapor
Skin Irrit. 2	H315 - Causes skin irritation
Eye Irrit. 2A	H319 - Causes serious eye irritation
Repr. 1B	H360 - May damage fertility or the unborn child
STOT SE 3	H336 - May cause drowsiness or dizziness
STOT RE 2	H373 - May cause damage to organs through prolonged or repeated exposure
Asp. Tox. 1	H304 - May be fatal if swallowed and enters airways

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02 GHS07 GHS08

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H226 - Flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness
H360 - May damage fertility or the unborn child
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary statements (GHS-US) :
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, sparks, open flames, hot surfaces. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, ventilating, lighting equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge

P260 - Do not breathe vapors, mist, spray
P261 - Avoid breathing vapors, mist, spray
P264 - Wash skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves, protective clothing, eye protection, face protection
P301+P310 – IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353 – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308+P313 - If exposed or concerned: Get medical advice/attention
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P314 - Get medical advice/attention if you feel unwell
P331 - Do NOT induce vomiting
P332+P313 - If skin irritation occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P370+P378 - In case of fire: Use appropriate media extinction
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local, regional, national, and/or international regulations.

2.3. Other hazards

Under United States Regulations (29 CFR 1910.1200- Hazard Communication Standards), this product is considered hazardous.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

Mixture

Name : Mineral Spirits Regular

CAS No : 8052-41-3

Name	Product identifier	%	GHS-US classification
1,2,4-Trimethylbenzene	(CAS No) 95-63-6	5.14	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 STOT SE 3, H335 Aquatic Chronic 2, H411
Xylene	(CAS No) 1330-20-7	0.15	Flam. Liq. 3, H226 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Acute Tox. 4 (Inhalation:vapour), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT SE 3, H336 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Call a physician immediately.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention immediately.

First-aid measures after skin contact : In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove and isolate contaminated clothing. Wash skin with soap and water.

First-aid measures after eye contact : In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. Get medical attention.

First-aid measures after ingestion : Do not give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : May cause drowsiness or dizziness.

Symptoms/injuries after skin contact	: Irritation.
Symptoms/injuries after eye contact	: Irritation to eyes.
Symptoms/injuries after ingestion	: Risk of lung edema.

4.3. Indication of any immediate medical attention and special treatment needed

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRE: Water spray, fog or regular foam.
Unsuitable extinguishing media	: Do not use direct water stream.

5.2. Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards	: Containers may explode when heated. Vapor explosion hazard indoors, outdoors or in sewers. HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks, or flames. Many liquids are lighter than water. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Runoff to sewer may create fire or explosion hazard. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.
Hazardous Combustion Products	: Carbon monoxide and Carbon dioxide.

5.3. Advice for firefighters

Protection during firefighting	: Structural firefighters' protective clothing will only provide limited protection. Wear positive pressure self-contained breathing apparatus (SCBA). Move containers from fire area if you can do it without risk. LARGE FIRES: Cool containers with flooding quantities of water until well after fire is out. FIRE INVOLVING TANKS AND CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Personal Precautions	: Ventilate the area. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

6.1.2. For emergency responders

Emergency procedures	: As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions ; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. LARGE SPILL : Consider initial downwind evacuation for at least 300 meters (1000 feet) ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering.

6.2. Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3. Methods and material for containment and cleaning up

Containment/ Clean-up	: Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. A vapor suppressing foam may be used to reduce vapors. All equipment used when handling the product must be grounded. LARGE SPILLS : Dike far ahead of liquid spill for later disposal. LARGE SPILLS : Water spray may reduce vapor ; but may not prevent ignition in closed spaces.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8 : Exposure-controls/personal protection"".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Use only with adequate ventilation. Keep away from heat, sparks, and flame. All equipment used when handling the product must be grounded. Bond and ground all equipment when transferring from one vessel to another. Product can accumulate static charge by flow or agitation. Take precautionary measures against static charges. Empty containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. Do not use sparking tools. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe mist, vapors and/or spray. Avoid contact with skin, eyes, and clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

Hygiene measures : Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment.

Storage conditions : Keep away from heat and ignition sources. Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Stoddard solvent (8052-41-3)		
ACGIH	ACGIH TWA (ppm)	100 ppm
ACGIH	Remark (ACGIH)	Eye, skin, & kidney dam;
OSHA	OSHA PEL (TWA) (mg/m³)	2900 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	500 ppm

1,2,4-Trimethylbenzene (95-63-6)		
ACGIH	ACGIH TWA (ppm)	25 ppm (Trimethyl benzene (mixed isomers); USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)

Xylene (1330-20-7)		
ACGIH	ACGIH TWA (ppm)	100 ppm
ACGIH	ACGIH STEL (ppm)	150 ppm
ACGIH	Remark (ACGIH)	URT & eye irr; CNS impair
OSHA	OSHA PEL (TWA) (mg/m³)	435 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	100 ppm

8.2. Exposure controls

Appropriate engineering controls : Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof electrical/ ventilating/ lighting/ equipment.

Hand protection : Protective gloves.

Eye protection : Wear chemical splash safety goggles.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : In case of insuffienct ventilation, wear suitable respiratory equipment. Follow OSHA respirator regulations found in 29 CFR 1910.134. Use a NIOSH/ MSHA approved respirator if exposure limits are exceeded or symptoms are experienced.

Environmental exposure controls : Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release ans release to waterways. Follow best practice for site management and disposal of waste.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Liquid.
Color	:	Colorless
Odor	:	Petroleum-like odor
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	Not applicable
Freezing point	:	No data available
Boiling point range	:	149- 213 °C / 300-415 °F
Flash point	:	100 °F minimum
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Explosion limits	:	0.8 - 5.6 vol %
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Vapor pressure	:	2.85 hPa (20 °C)
Vapor pressure at 50 °C	:	5.2-5.85,25 °C
Relative density/ Specific Gravity	:	0.86
Relative vapor density at 20 °C	:	No data available
Solubility	:	Water: Negligible
Log Pow	:	3.16-7.06
Auto-ignition temperature	:	260 °C
Decomposition temperature	:	No data available
Viscosity	:	No data available
Viscosity, kinematic	:	1.2 mm²/s (25 °C)
Viscosity, dynamic	:	No data available

9.2. Other information

VOC content	:	No data available
Other properties	:	Clear.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reaction known under conditions of normal use.

10.2. Chemical stability

Stable under normal temperatures and pressures.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

Keep away from heat, sparks and flame. Incompatible materials.

10.5. Incompatible materials

Oxidizing materials.

10.6. Hazardous decomposition products

Burning can produce carbon monoxide and carbon dioxide. Carbon monoxide is highly toxic if inhaled (200 ppm OSHA Ceiling). Carbon dioxide in sufficient quantities cana ct as an asphyxiant.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Stoddard solvent (8052-41-3)	
LC50 inhalation rat (ppm)	>1400 ppm 8 hour(s); Acute Inhalation Toxicity

1,2,4-Trimethylbenzene (95-63-6)	
LD50 oral rat	> 5000 mg/kg (Rat; Equivalent or similar to OECD 401; Literature; 6000 mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rat	> 3440 mg/kg (Rat; Read-across; OECD 402: Acute Dermal Toxicity)
LC50 inhalation rat (mg/l)	18 mg/l/4h (Rat)
ATE US (gases)	4500.000 ppmV/4h
ATE US (vapors)	18.000 mg/l/4h
ATE US (dust, mist)	1.500 mg/l/4h

Xylene (1330-20-7)	
LD50 oral rat	3523 - 8600 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Literature study; 3523 mg/kg bodyweight; Rat; OECD 401: Acute Oral Toxicity; Experimental value; >4000 mg/kg bodyweight; Rat; OECD 401: Acute Oral Toxicity; Experimental value)
LD50 dermal rabbit	> 4200 mg/kg body weight (Rabbit; Experimental value; OECD 402: Acute Dermal Toxicity)
LC50 inhalation rat (mg/l)	29 mg/l/4h (Rat; Experimental value; 27.57 mg/l/4h; Rat; Experimental value)
ATE US (oral)	3523.000 mg/kg body weight
ATE US (dermal)	1100.000 mg/kg body weight
ATE US (gases)	4500.000 ppmV/4h
ATE US (vapors)	11.000 mg/l/4h
ATE US (dust, mist)	1.500 mg/l/4h

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Causes serious eye irritation.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Xylene (1330-20-7)	
IARC group	3 - Not Classifiable

Reproductive toxicity : May damage fertility or the unborn child.

Specific target organ toxicity (single exposure) : May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure) : May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : May be fatal if swallowed and enters airways.

Symptoms/injuries after skin contact : Irritation.

Symptoms/injuries after eye contact : Irritation to eyes.

Symptoms/injuries after ingestion : Risk of lung edema.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

1,2,4-Trimethylbenzene (95-63-6)	
LC50 fish 1	7.72 mg/l (LC50; 96 h; Pimephales promelas; Flow-through system; Fresh water)
EC50 Daphnia 1	3.6 mg/l (LC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna; Static system; Fresh water; Experimental value)
Threshold limit algae 2	2.356 mg/l (EC50; ECOSAR; 96 h; Algae; Fresh water)

12.2. Persistence and degradability

1,2,4-Trimethylbenzene (95-63-6)	
Persistence and degradability	Not readily biodegradable in water. Forming sediments in water. Biodegradable in the soil. Adsorbs into the soil. Low potential for mobility in soil. Photodegradation in the air.
Chemical oxygen demand (COD)	0.44 g O_2/g substance

Xylene (1330-20-7)	
Persistence and degradability	Readily biodegradable in water. Biodegradable in the soil. No (test)data on mobility of the substance available. Photolysis in the air.

12.3. Bioaccumulative potential

Stoddard solvent (8052-41-3)	
Log Pow	3.16-7.06
1,2,4-Trimethylbenzene (95-63-6)	
BCF fish 1	31 - 275 (BCF; Other; 8 weeks; Cyprinus carpio)
Log Pow	3.63 - 4.09 (Experimental value)
Bioaccumulative potential	Potential for bioaccumulation (4 ≥ Log Kow ≤ 5).
Xylene (1330-20-7)	
BCF fish 2	7 - 26 (BCF; 8 weeks; Oncorhynchus mykiss; Flow-through system; Fresh water)
Log Pow	3.2 (Conclusion by analogy; 20 °C)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

12.4. Mobility in soil

Stoddard solvent (8052-41-3)	
Log Koc	log Koc,2.85-6.74
1,2,4-Trimethylbenzene (95-63-6)	
Surface tension	0.029 N/m
Log Koc	log Koc,3.04; Calculated value
Ecology - soil	May be harmful to plant growth, blooming and fruit formation.
Xylene (1330-20-7)	
Ecology - soil	May be harmful to plant growth, blooming and fruit formation.

12.5. Other adverse effects

: No studies have been found.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Dispose of content and/ or container in accordance with local, regional, national, and/ or international regulations.

SECTION 14 : Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1268 Petroleum distillates, n.o.s., 3, II

UN-No.(DOT) : UN1268

Proper Shipping Name (DOT) : Petroleum distillates, n.o.s.

Transport hazard class(es) (DOT) : 3 – Class 3 – Flammable and combustible liquid 49 CFR 173.120

Hazard labels (DOT) : 3 – Flammable liquid



Packing group (DOT) : II – Medium Danger

DOT Packaging Non Bulk (49 CFR 173.xxx) : 202

DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT Special Provisions (49 CFR 172.102)	:	144 – If transported as a residue in an underground storage tank (UST), as defined in 40 CFR 280.12, that has been cleaned and purged or rendered inert according to the American Petroleum Institute (API) Standard 1604 (IBR, see 171.7 of this subchapter), then the tank and this material are not subject to any other requirements of this subchapter. However, sediments remaining in the tank that meet the definition for a hazardous material are subject to the applicable regulations of this subchapter. IB2 – Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. T7 – 4 178.274(d)(2) Normal..... 178.275(d)(3) TP1 – The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / 1 + a (tr – tf) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees □elsius of the liquid during filling. TP8 – A portable tank having a minimum test pressure of 1.5 bar (150 kPa) may be used when the flash point of the hazardous material transported is greater than 0 C (32 F). TP28 - A portable tank having a minimum test pressure of 2.65 bar (265 kPa) may be used provided the calculated test pressure is 2.65 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	150
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	60 L
DOT Vessel Stowage Location	:	B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
Other information	:	No supplementary information available.

TDG

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Stoddard solvent (8052-41-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Hazard Classifications: Acute, Chronic, Fire	

1,2,4-Trimethylbenzene (95-63-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	

Xylene (1330-20-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	100 lb

15.2. International regulations

CANADA
No additional information available

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations

Stoddard solvent (8052-41-3)	
State or local regulations	U.S. - New Jersey - Right to Know Hazardous Substance List

1,2,4-Trimethylbenzene (95-63-6)
U.S. - New Jersey - Right to Know Hazardous Substance List

Xylene (1330-20-7)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date : 12/15/2015

Full text of H-phrases:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal) Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation) Category 4
Acute Tox. 4 (Inhalation vapor)	Acute toxicity (inhalation: vapor) Category 4
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Liq. 3	Flammable liquids Category 3
Repr. 1B	Reproductive toxicity Category 1B
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H312	Harmful in contact with skin
H315	Causes skin irritation
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 2 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



SDS US (GHS HazCom 2012)

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Whitaker Oil Company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Whitaker Oil Company has been advised of the possibility of such damages. The vendor assumes no responsibility for injury or damages resulting from the inappropriate alteration or manipulation of this SDS and its contents from that originally submitted by Whitaker Oil Company.

SAFETY DATA SHEET

1. Identification

Product identifier	**ZRC and Galvilite Cold Galvanizing Compounds - Aerosol**
Other means of identification	
Product code	10000, 20010
Recommended use	Corrosion protection of iron and steel.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Supplier/Manufacturer	ZRC Worldwide
Address	145 Enterprise Drive, Marshfield, MA 02050
Telephone	781-319-0400
Emergency telephone (CHEMTREC)	703-527-3887 CCN15781
Email	info@zrcworldwide.com

2. Hazard(s) identification

Physical hazards	Flammable aerosols	Category 1
	Gases under pressure	Liquefied gas
Health hazards	Serious eye damage/eye irritation	Category 2
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 1
	Hazardous to the aquatic environment, long-term hazard	Category 1
OSHA defined hazards	Not classified.	

Label elements



Signal word	Danger
Hazard statement	Extremely flammable aerosol. Causes serious eye irritation. May cause drowsiness or dizziness. Very toxic to aquatic life with long lasting effects. Contains gas under pressure; may explode if heated.
Precautionary statement	
Prevention	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use. Avoid breathing gas. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear eye protection/face protection.
Response	If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center/doctor if you feel unwell. If eye irritation persists: Get medical advice/attention. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Zinc	7440-66-6	40 - 50
Acetone	67-64-1	15 - 25
Propane	74-98-6	5 - 15
Methyl Ethyl Ketone	78-93-3	5 - 10
Stoddard solvent	8052-41-3	5 - 10
N-Butane	106-97-8	3 - 8
Zinc oxide	1314-13-2	≤ 2

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Move to fresh air. Get medical attention if any discomfort continues.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion Not likely, due to the form of the product. Rinse mouth. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and delayed Causes serious eye irritation. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically.

General information In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media Dry chemicals. Foam. Class B fire extinguisher.

Unsuitable extinguishing media Water. Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Contents under pressure. Pressurized container may explode when exposed to heat or flame. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk. Containers should be cooled with water to prevent vapor pressure build up. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Water runoff can cause environmental damage.

General fire hazards Extremely flammable aerosol.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Collect spillage. Scoop up used absorbent into drums or other appropriate container. Prevent product from entering drains. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Pressurized container: Do not pierce or burn, even after use. Do not use if spray button is missing or defective. Keep away from open flames, hot surfaces and sources of ignition. Do not smoke while using or until sprayed surface is thoroughly dry. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Do not taste or swallow. Avoid breathing gas. Avoid contact with skin. Avoid contact with eyes. Avoid prolonged exposure. Use only in well-ventilated areas. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash thoroughly after handling. Avoid release to the environment. Do not empty into drains.

Conditions for safe storage, including any incompatibilities

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C/122 °F. Do not puncture, incinerate or crush. Keep away from heat, sparks and open flame.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Acetone (CAS 67-64-1)	PEL	2400 mg/m3	
		1000 ppm	
Methyl Ethyl Ketone (CAS 78-93-3)	PEL	590 mg/m3	
		200 ppm	
Propane (CAS 74-98-6)	PEL	1800 mg/m3	
		1000 ppm	
Stoddard solvent (CAS 8052-41-3)	PEL	2900 mg/m3	
		500 ppm	
Zinc oxide (CAS 1314-13-2)	PEL	5 mg/m3	Respirable fraction.
		5 mg/m3	Fume.
		15 mg/m3	Total dust.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Acetone (CAS 67-64-1)	STEL	500 ppm	
	TWA	250 ppm	
Methyl Ethyl Ketone (CAS 78-93-3)	STEL	300 ppm	
	TWA	200 ppm	
N-Butane (CAS 106-97-8)	STEL	1000 ppm	
Stoddard solvent (CAS 8052-41-3)	TWA	100 ppm	
Zinc oxide (CAS 1314-13-2)	STEL	10 mg/m3	Respirable fraction.
	TWA	2 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Acetone (CAS 67-64-1)	TWA	590 mg/m3	
		250 ppm	
Methyl Ethyl Ketone (CAS 78-93-3)	STEL	885 mg/m3	
		300 ppm	
	TWA	590 mg/m3	
		200 ppm	
N-Butane (CAS 106-97-8)	TWA	1900 mg/m3	
		800 ppm	
Propane (CAS 74-98-6)	TWA	1800 mg/m3	
		1000 ppm	
Stoddard solvent (CAS 8052-41-3)	Ceiling	1800 mg/m3	
	TWA	350 mg/m3	
Zinc oxide (CAS 1314-13-2)	Ceiling	15 mg/m3	Dust.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
		5 mg/m3	Dust.

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Acetone (CAS 67-64-1)	25 mg/l	Acetone	Urine	*
Methyl Ethyl Ketone (CAS 78-93-3)	2 mg/l	MEK	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Methyl Ethyl Ketone (CAS 78-93-3) Can be absorbed through the skin.

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide easy access to water supply and eye wash facilities.

Individual protection measures, such as personal protective equipment

Eye/face protection Avoid contact with eyes. Wear safety glasses with side shields (or goggles). Eye wash fountain and emergency showers are recommended.

Skin protection

Hand protection For prolonged or repeated skin contact use suitable protective gloves. Neoprene gloves are recommended.

Skin protection

Other Wear appropriate chemical resistant clothing.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance Gray liquid.

Physical state Gas.

Form Aerosol- Pressurized Liquid.

Color Gray.

Odor Hydrocarbon.

Odor threshold Not available.

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range 395.6 °F (202 °C)

Flash point < 19.4 °F (< -7.0 °C) Tag Open Cup

Evaporation rate > 1 BuAc (n-Butyl acetate=1)

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 1.1

Flammability limit - upper (%)	12.8
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	50 mm Hg (21°C / 70°F)
Vapor density	> 1 (24°C / 77°F)
Relative density	1.2
Solubility(ies)	
Solubility (water)	Slightly soluble in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Bulk density	10.01 lb/gal
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
VOC	< 30 %

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Avoid contact with acids and alkalies. Strong oxidizing agents. Water.
Hazardous decomposition products	Zinc oxides. CO, CO2, Various hydrocarbon gases. Contact with acids will release flammable hydrogen gas.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Vapors may cause drowsiness and dizziness.
Skin contact	Prolonged or repeated contact may dry skin and cause irritation.
Eye contact	Causes serious eye irritation.
Ingestion	May cause discomfort if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Causes serious eye irritation. Symptoms include itching, burning, redness, and tearing of eyes. Vapors may cause drowsiness and dizziness.

Information on toxicological effects

Acute toxicity Not expected to be acutely toxic.

Components	Species	Test Results
Acetone (CAS 67-64-1)		
Acute		
Dermal		
LD50	Rabbit	> 20 ml/kg
Inhalation		
LC50	Rat	50 mg/l, 8 Hours
Oral		
LD50	Rat	5800 mg/kg

Components	Species	Test Results
Propane (CAS 74-98-6)		
Acute		
Inhalation		
Gas		
LC50	Rat	> 80000 ppm, 15 Minutes
Stoddard solvent (CAS 8052-41-3)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	> 5.2 mg/l, 4 hours
Oral		
LD50	Rat	> 5000 mg/kg
Zinc (CAS 7440-66-6)		
Acute		
Oral		
LD50	Rat	630 mg/kg

Skin corrosion/irritation Not classified.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization Not classified.

Skin sensitization Not classified.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity Not classified.

Specific target organ toxicity - single exposure Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not classified.

Chronic effects Prolonged inhalation may be harmful.

Further information No other specific acute or chronic health impact noted.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.

Components		Species	Test Results
Acetone (CAS 67-64-1)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	> 100 mg/l, 96 hours
Zinc (CAS 7440-66-6)			
Aquatic			
Crustacea	LC50	Daphnia magna	0.068 mg/l, 48 hours

Components		Species	Test Results
Zinc oxide (CAS 1314-13-2)			
Aquatic			
Crustacea	LC50	Water flea (Daphnia magna)	0.098 mg/l, 48 Hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available for this product.

Partition coefficient n-octanol / water (log Kow)

Acetone (CAS 67-64-1)	-0.24
Methyl Ethyl Ketone (CAS 78-93-3)	0.29
N-Butane (CAS 106-97-8)	2.89
Propane (CAS 74-98-6)	2.36
Stoddard solvent (CAS 8052-41-3)	3.16 - 7.15

Mobility in soil The product is slightly soluble in water.

Other adverse effects The product contains volatile organic compounds which have a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Contents under pressure. Do not puncture, incinerate or crush. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazardous waste code D001: Waste Flammable material with a flash point <140 F
D003: Waste Reactive material

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Do not re-use empty containers.

14. Transport information

DOT

UN number	UN1950
UN proper shipping name	Aerosols, flammable
Transport hazard class(es)	
Class	2.1
Subsidiary risk	-
Label(s)	2.1
Packing group	Not available.
Environmental hazards	
Marine pollutant	Yes
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN1950
UN proper shipping name	Aerosols, flammable
Transport hazard class(es)	
Class	2.1
Subsidiary risk	-
Label(s)	2.1
Packing group	Not available.
Environmental hazards	Yes
ERG Code	10L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1950
UN proper shipping name	AEROSOLS, flammable
Transport hazard class(es)	
Class	2.1
Subsidiary risk	-
Packing group	Not available.

Environmental hazards

Marine pollutant Yes

EmS F-D, S-U

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

General information Limited Quantity exemption may apply.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Zinc (CAS 7440-66-6) 1.0 % One-Time Export Notification only.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetone (CAS 67-64-1)	LISTED
Methyl Ethyl Ketone (CAS 78-93-3)	LISTED
N-Butane (CAS 106-97-8)	LISTED
Propane (CAS 74-98-6)	LISTED
Zinc (CAS 7440-66-6)	LISTED
Zinc oxide (CAS 1314-13-2)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - Yes
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Zinc	7440-66-6	40 - 50
Zinc oxide	1314-13-2	≤ 2

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

N-Butane (CAS 106-97-8)
Propane (CAS 74-98-6)

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Acetone (CAS 67-64-1)	6532
Methyl Ethyl Ketone (CAS 78-93-3)	6714

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Acetone (CAS 67-64-1)	35 %WV
Methyl Ethyl Ketone (CAS 78-93-3)	35 %WV

DEA Exempt Chemical Mixtures Code Number

Acetone (CAS 67-64-1)	6532
Methyl Ethyl Ketone (CAS 78-93-3)	6714

US state regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Acetone (CAS 67-64-1)
Methyl Ethyl Ketone (CAS 78-93-3)
N-Butane (CAS 106-97-8)
Propane (CAS 74-98-6)
Stoddard solvent (CAS 8052-41-3)
Zinc (CAS 7440-66-6)
Zinc oxide (CAS 1314-13-2)

US. New Jersey Worker and Community Right-to-Know Act

Acetone (CAS 67-64-1)
Methyl Ethyl Ketone (CAS 78-93-3)
N-Butane (CAS 106-97-8)
Propane (CAS 74-98-6)
Stoddard solvent (CAS 8052-41-3)
Zinc (CAS 7440-66-6)
Zinc oxide (CAS 1314-13-2)

US. Pennsylvania Worker and Community Right-to-Know Law

Acetone (CAS 67-64-1)
Methyl Ethyl Ketone (CAS 78-93-3)
N-Butane (CAS 106-97-8)
Propane (CAS 74-98-6)
Stoddard solvent (CAS 8052-41-3)
Zinc (CAS 7440-66-6)
Zinc oxide (CAS 1314-13-2)

US. Rhode Island RTK

Acetone (CAS 67-64-1)
Methyl Ethyl Ketone (CAS 78-93-3)
N-Butane (CAS 106-97-8)
Propane (CAS 74-98-6)
Stoddard solvent (CAS 8052-41-3)
Zinc (CAS 7440-66-6)
Zinc oxide (CAS 1314-13-2)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	14-December-2013
Revision date	31-May-2017
Version #	04

NFPA ratings



List of abbreviations

LC50: Lethal Concentration, 50%.
LD50: Lethal Dose, 50%.
STEL: Short term exposure limit.
TWA: Time weighted average.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.

SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards, European Union CLP EC 1272/2008 and the Global Harmonization Standard

PART I *What is the material and what do I need to know in an emergency?*

1 – IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

IDENTIFICATION of the SUBSTANCE or PREPARATION:

TRADE NAME (AS LABELED): **DeWALT CHALKS**
SYNONYMS: DeWALT Black Chalk; DeWALT Blue Chalk; DeWALT Red Chalk; DeWALT White Chalk
CHEMICAL NAME/CLASS: Calcium Carbonate/Pigment/Silica Mixtures
RELEVANT USES of the MIXTURE: Chalks
USES ADVISED AGAINST: Other than Relevant Use

SUPPLIER OF THE SAFETY DATA SHEET:

U.S. MANUFACTURER'S NAME: **STANLEY WORKS**
ADDRESS: 480 Myrtle Street
New Britain, CT 06053
BUSINESS PHONE: 1-800-262-2161
EUROPEAN SUPPLIER/IMPORTER'S NAM:
ADDRESS:
BUSINESS PHONE:
EMERGENCY PHONE: CHEMTREC: 1-800-424-9300 (U.S., Canada, Puerto Rico. U.S. Virgin Islands)
+1-703-527-3887 (outside areas above, call collect)
DATE OF PREPARATION: December 11, 2007
DATE OF REVISION: July 18, 2013

ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2010 format. This material has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR. The material is also classified per all applicable EU Directives through EC 1907: 2006, the European Union CLP EC 1272/2008 and the Global Harmonization Standard.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: Classified in accordance with CLP Regulation (EC) 1272/2008.
Classification: Carcinogenic Cat. 2
Signal Word: Warning
Hazard Statement Codes: H351; For Blue Chalk Only: EUH032
Precautionary Statement Codes: P201, P202, P280, P308 + P313, P405, P501
Hazard Symbol/Pictogram: GHS08



EU 67/548/EEC LABELING AND CLASSIFICATION: Classified in accordance with the European Community Council Directive 67/548/EEC or subsequent Directives.
Classification: Carcinogenic Cat. 3
Risk Phrase Codes: R45; For Blue Chalk Only: R32
Safety Phrase Codes: S(1/2), S22, S25, S36/37/39, S38, S45, S53
Hazard Symbol: Xn



See Section 16 for full text of Classification

EMERGENCY OVERVIEW: Product Description: These products are colored, finely powdered, odorless chalks. **Health Hazards:** Inhalation of dusts from this product may irritate the respiratory system. Skin and eye contact may cause mechanical abrasion. These chalks contain Crystalline Silica, a known human carcinogen by inhalation. **Flammability Hazards:** These chalks are not flammable. Finely divided dusts from these products can form explosive mixtures in air. If involved in a fire, these products may decompose to form iron oxides, aluminum oxides, silicon dioxide, sulfur dioxide, magnesium oxides, carbon oxides and calcium oxides. **Reactivity Hazards:** These chalks are not normally reactive. For the Blue Chalk, contact with acids can release toxic hydrogen sulfide. **Environmental Hazards:** These products are not expected to pose significant harm to the environment, however all release to the environment should be avoided. **Emergency Recommendations:** Emergency responders must wear the personal protective equipment suitable for the situation to which they are responding.

3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS #	% w/w	**LABEL ELEMENTS** **EU Classification (67/548/EEC)** **GHS & EU Classification (1272/2008 EC)** **Risk Phrases/Hazard Statements**
Limestone/Calcium Carbonate ($CaCO_3$)	1317-65-3	215-279-6	70-100%	EU 67/548: Classification: Not applicable. GHS & EU 1272/2008: Classification: Not applicable.

See Section 16 for full text of Classification

3. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS #	% w/w	**LABEL ELEMENTS** **EU Classification (67/548/EEC)** **GHS & EU Classification (1272/2008 EC)** **Risk Phrases/Hazard Statements**
Crystalline Silica	14808-60-7	238-878-4	0.1-1.5%	SELF-CLASSIFICATION EU 67/548 Classification: Carcinogenic Cat. 3 Risk Phrase Codes: R45 GHS and EU 1272/2008 Classification: Carcinogenic Cat. 2 Hazard Codes: H351
The following are pigments in each of the chalks:				
Blue Chalk: Sodium Alumino Sulphosilicate/C.I. Pigment Blue 29	57455-37-5	Unlisted	20-30%	SELF-CLASSIFICATION EU 67/548 Classification: None Risk Phrase Codes: R32 GHS and EU 1272/2008 Classification: None Supplemental Hazard Codes: EUH032
Red Chalk: Hematite/Iron Oxide (Fe_2O_3)	1317-60-8	215-275-4	20-30%	EU 67/548: Classification: Not applicable. GHS & EU 1272/2008: Classification: Not applicable.
Black Chalk: Carbon Black	1333-86-4	215-609-9	17-23%	EU 67/548: Classification: Not applicable. GHS & EU 1272/2008: Classification: Not applicable.
White Chalk: Magnesium Carbonate ($MgCo_3$)	546-93-0	208-915-6	0-2%	EU 67/548: Classification: Not applicable. GHS & EU 1272/2008: Classification: Not applicable.

See Section 16 for full text of Classification

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must be taken for medical attention if any adverse effects occur. Remove contaminated clothing and shoes. Take a copy of this SDS to health professional with victim. Wash clothing and thoroughly clean shoes before reuse.

SKIN EXPOSURE: If skin contact with this material occurs, flush affected area with water. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention if any adverse effects occur after flushing.

EYE EXPOSURE: If this material enters the eyes, open contaminated individual's eyes while under gently running water. Use sufficient force to open eyelids. Have contaminated individual "roll" eyes. Minimum flushing is for 20 minutes. Contaminated individual must seek medical attention if adverse effect occurs or continues after flushing.

INHALATION: If dusts of this material are inhaled, remove victim to fresh air. The contaminated individual must seek medical attention if any adverse effects occur.

INGESTION: If this material is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, seek immediate medical attention. If alert, victim should drink up to three glasses of water. Do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If victim is convulsing, maintain an open airway and obtain emergency medical attention.

IMPORTANT SYMPTOMS AND EFFECTS: See Sections 2 (Hazard Identification) and 11 (Toxicological Information).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting respiratory problems, dermatitis, and other skin disorders may be aggravated by exposure to this product.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Not applicable.

FIRE EXTINGUISHING MEDIA: Unless incompatibilities exist for surrounding materials, carbon dioxide, water spray, 'ABC' type chemical extinguishers, foam, dry chemical and halon extinguishers can be used to fight fires involving this material.

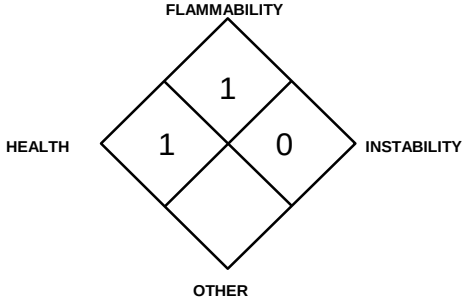
UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

SPECIAL HAZARDS ARISING FROM THE SUBSTANCE: Finely divided dusts from these products can form explosive mixtures in air. If involved in a fire, these products may decompose to form iron oxides, aluminum oxides, silicon dioxide, sulfur dioxide, magnesium, carbon and calcium oxides.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Finely divided dusts from this material pose a hazard of an air/dust explosion in presence of an ignition source.

NFPA RATING



Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe

5. FIRE-FIGHTING MEASURES (Continued)

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. Water fog or spray can also be used to cool fire-exposed containers. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly before returning such equipment to service.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES: It is suggested that kits include a respirator, chemical splash goggles, two pairs of gloves, two sheets (12" x 12") of absorbent material, 250-mL and 1-liter spill control pillows, a small scoop to collect glass fragments (if applicable) and two large waste disposal bags. Absorbents should be able to be incinerated. Avoid generating airborne dusts of this material during spill response procedures as described below.

PROTECTIVE EQUIPMENT:

Small Spills/Spills in Hoods: Personnel wearing nitrile or other appropriate gloves, labcoat or other protective clothing and eye protection should immediately clean incidental spills of less than 5 g.

Large Spills: Use proper protective equipment, including double nitrile or appropriate gloves, and protective clothing (e.g., disposable Tyvek coveralls). When there is any danger of airborne dusts being generated, use a full-face respirator equipped with a High Efficiency Particulate (HEPA) filter. Self-Contained Breathing Apparatus (SCBA) can be used instead of an air-purifying respirator.

METHODS FOR CLEAN-UP AND CONTAINMENT:

Cleanup of Small Spills: Solids should be gently covered with wet absorbent pads. Clean spill with pad and dispose of properly. Decontaminate the spill area (three times) using a bleach and detergent solution and then rinse with clean water.

Large Spills: Restrict access to the spill areas. For spills of greater than 5 g, be sure not to generate dusts by gently covering with damp absorbent sheets, spill-control pads, pillows, cloths, or towels. The dispersion of particles into surrounding air and the possibility of inhalation is a serious matter and should be treated as such. Do not apply chemical in-activators as they may produce hazardous by-products. Sweep up or vacuum spilled solid (an explosion-proof vacuum should be used), avoiding the generation of airborne dusts. Decontaminate the area thoroughly.

All Spills: Use procedures described above and then place all spill residues in an appropriate, labeled container and seal. Move to a secure area. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13, Disposal Considerations). For spills on water, contain, minimize dispersion and collect. Dispose of recovered material and report spill per regulatory requirements.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Do not flush to sewer. For spills on water, contain, minimize dispersion and collect.

REFERENCE TO OTHER SECTIONS: Review Sections 2, 8, 11, & 12 before proceeding with cleanup. See Section 13, Disposal Considerations for more information.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

PRECAUTIONS FOR SAFE HANDLING: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing airborne dusts generated by this product. Use in a well-ventilated location. Ensure this product is used with adequate ventilation and personal protective equipment (see Section 8, Exposure Controls and Personal Protection). Avoid airborne dusts generated by this product. Clean work areas routinely to prevent accumulation of dust. Clean up spills promptly.

CONDITIONS FOR SAFE STORAGE: Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers). Keep container tightly closed when not in use. Refer to NFPA 654, *Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids* for additional information on storage.

SPECIFIC END USE(S): These products are used in chalk line devices in construction. Follow all industry standards for use of this product.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment thoroughly, before maintenance begins. Collect all rinsates and dispose of according to applicable or applicable federal, state, provincial and local standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section if applicable. Ensure eyewash/safety shower stations are available near areas where this product is used.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

WORKPLACE EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	OTHER
		TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Calcium Carbonate	1317-65-3	NE	NE	15 (total dust); 5 (resp. fract.)	NE	10 (total dust); 5 (resp. fract.)	NE	NE	NE
Carbon Black	1333-86-4	3 (inhal. fract.)	NE	3.5	NE	3.5 (0.1 in presence of PAHs, as PAHs; 10-hr TWA)	NE	1750	DFG MAK: as Inhalable Dust Carcinogen: IARC-2B, MAK-3B, NIOSH-Ca (in presence of PAHs), TLV-A3
C.I. Pigment Blue 29	57455-37-5	NE	NE	NE	NE	NE	NE	NE	NE
Crystalline Silica	14808-60-7	0.025 (resp. fract.)	NE	30 mg/m^3 (total dust) % SO_2 + 2 250 mppcf (resp. dust) % SiO2 + 5 or 10 mg/m^3 (resp. dust) % SO_2 + 2		0.05 (resp. dust)	NE	0.05	Carcinogen: IARC-1, MAK-1 (respirable), NIOSH-Ca, NTP-K (respirable), TLV-A2
Iron Oxide/Hematite Exposure Limits given are for Iron oxide CAS# 1309-37-1	1317-60-8	3 (resp. fract.)	NE	10 (fume)	NE	5 (dust and fume as Fe)	NE	NE	DFG MAK: With the exception of iron oxides which are not biologically available. Carcinogen: IARC-3, MAK-3B, TLV-A4
Magnesium Carbonate Exposure limits given are for talc, containing no asbestos fibers, CAS # 14807-96-6)	546-93-0	2 (resp. fract.)	NE	20 mppcf (containing < 1% quartz)	NE	2 (resp. dust) & < 1% quartz	NE	NE	Carcinogen: IARC-3, MAK-3B, TLV-A4 (respirable)

NE = Not Established. See Section 16 for Definitions of Terms Used.

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: Currently, the following additional international exposure limits are established for some components of this product.

CALCIUM CARBONATE:
Belgium: TWA = 10 mg/m^3, MAR 2002
Hungary: TWA = 10 mg/m^3, SEP 2000
Japan: OEL = 2 mg/m^3 (resp. dust), 84 mg/m^3 (total dust), MAY 2009
Korea: TWA = 10 mg/m^3, 2006
Mexico: TWA = 10 mg/m^3; STEL 20 mg/m^3 (inhalable), 2004
The Netherlands: MAC-TGG = 10 mg/m^3, 2003
New Zealand: TWA = 10 mg/m^3 (inspirable dust), JAN 2002
Poland: MAC(TWA) dust = 10 mg/m^3, JAN 1999
Russia: STEL = 6 mg/m^3, JUN 2003
Switzerland: MAK-W = 3 mg/m^3, DEC 2006
United Kingdom: TWA = 10 mg/m^3 (inhal. dust), OCT 2007
United Kingdom: TWA = 4 mg/m^3 (respirable dust), OCT 2007
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

CARBON BLACK:
Australia: TWA = 2.5 mg/m^3, JUL 2008
Austria: MAK-TMW = 2 mg/m^3, resp, 2007
Belgium: TWA = 2 mg/m^3, MAR 2002
Denmark: TWA = 0.3 f/cc, carc, MAY 2011
Finland: TWA 0.5 mg/m^3, NOV 2011
France: VME = 3.5 mg/m^3, FEB 2006
Iceland: TWA = 0.3 f/cc, NOV 2011
Japan: OEL = 0.5 mg/m^3 (resp. dust), 2 mg/m^3 (total dust), MAY 2009
Korea: TWA = 2 mg/m^3, 2006

CARBON BLACK (continued):
Mexico: TWA = 2 mg/m^3; STEL = 7 mg/m^3, 2004
The Netherlands: MAC-TGG = 1 mg/m^3, 2003
New Zealand: TWA = 2 mg/m^3 (respirable dust), JAN 2002
Norway: TWA = 3.5 mg/m3, JAN 1999
Peru: TWA = 2 mg/m^3, JUL 2005
The Philippines: TWA = 3.5 mg/m^3, JAN 1993
Russia: STEL = 4 mg/m^3, JUN 2003
Sweden: TWA = 2 mg/cm^3 (total dust); TWA = 1 mg/cm^3 (resp. dust), JUN 2005
Switzerland: MAK-W = 2 mg/m^3, DEC 2006
United Kingdom: TWA = 1 mg/m^3 (resp. dust), OCT 2007
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

CRYSTALLINE SILICA:
Australia: TWA = 0.1 mg/m^3, JUL 2008
Belgium: TWA = 0.1 mg/m^3 (resp. dust), MAR 2002
Denmark: TWA = 0.1 mg/m^3 (respirable), carc, MAY 2011
Denmark: TWA = 0.1 mg/m^3 (resp.), carc, MAY2011
Denmark: TWA = 0.3 mg/m^3 (total), MAY 2011
Finland: TWA = 0.05 mg/m^3, resp. dust, SEP 2009
France: VME = 0.1 mg/m^3, (resp), FEB 2006
Iceland: TWA = 0.1 mg/m^3 (resp. dust), NOV 2011
Japan: OEL-C = 0.03 mg/m^3 (respirable), APR 2007
Korea: TWA = 0.1 mg/m^3, 2006
Mexico: TWA = 0.1 mg/m^3 (respirable), 2004
The Netherlands: MAC-TGG = 0.075 mg/m^3, 2003
New Zealand: TWA = 0.2 mg/m^3 (respirable dust), JAN 2002
Norway: TWA = 0.1 mg/m^3 (resp. dust), JAN 1999

CRYSTALLINE SILICA (continued):
Norway: TWA = 0.3 mg/m^3 (total dust), JAN 1999
Peru: TWA = 0.05 mg/m^3, JUL 2005
Russia: TWA = 1 mg/m^3, STEL = 3 mg/m^3, JUN 2003
Sweden: TWA = 0.1 mg/m^3 (resp. dust), JUN 2005
Switzerland: MAK-W = 0.15 mg/m^3, DEC 2006
Thailand: TWA = 10 mg/m^3 (resp. dust), JAN 1993
Thailand: TWA = 30 mg/m^3 (total dust), JAN 1993
United Kingdom: TWA = 0.1 mg/m^3 (resp. dust), OCT 2007
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

IRON OXIDE/MAGNETITE:
Russia: STEL = 4 mg/m^3, JUN 2003

MAGNESIUM CARBONATE (TALC):
Australia: TWA = 2.5 mg(F)/m^3, JUL 2008
Belgium: TWA = 10 mg/m^3, MAR 2002
France: VME = 10 mg/m^3, FEB 2006
Korea: TWA = 10 mg/m^3, 2006
Mexico: TWA = 10 mg/m^3; STEL = 20 mg/m^3 (inhalable), 2004
The Netherlands: MAC-TGG = 10 mg/m^3, 2003
New Zealand: TWA = 10 mg/m^3 (inspirable dust), JAN2002
Norway: TWA = 0.6 mg(F)/m^3, JAN 1999
Peru: TWA = 10 mg/m^3, JUL 2005
Russia: STEL = 10 mg/m^3, JUN 2003
Switzerland: MAK-W = 3 mg/m^3, DEC 2006
United Kingdom: TWA = 4 mg/m^3 (resp. dust), OCT 2007
United Kingdom: TWA = 10 mg/m^3 (inhal. dust), OCT 2007
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

PROTECTIVE EQUIPMENT: *The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132, including* U.S. Federal OSHA Respiratory Protection (29 CFR 1910.134), OSHA Eye Protection 29 CFR 1910.133, OSHA Hand Protection 29 CFR 1910.138, OSHA Foot Protection 29 CFR 1910.136 and OSHA Body Protection 29 CFR1910.132)*, equivalent standards of Canada (including CSA Respiratory Standard Z94.4-02,* Z94.3-M1982, *Industrial Eye and Face Protectors and* CSA Standard Z195-02, *Protective Footwear), or standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection). Please reference applicable regulations and standards for relevant details.*

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

PROTECTIVE EQUIPMENT (continued):

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below exposure limits listed above. For materials without listed exposure limits, minimize respiratory exposure. If necessary, use only respiratory protection authorized under appropriate regulations. Oxygen levels below 19.5% are considered IDLH by U.S. OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. OSHA's Respiratory Protection Standard (1910.134-1998). The following are NIOSH Respiratory Protection Equipment Guidelines for some components of these products:

CARBON BLACK

CONCENTRATION	RESPIRATORY PROTECTION
Up to 17.5 mg/m3:	Any Dust and Mist Respirator.
Up to 35 mg/m3:	Any Dust and Mist Respirator except single-use and quarter-mask respirators, or any Supplied-Air Respirator (SAR).
Up to 87.5 mg/m3:	Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with a dust and mist filter.
Up to 175 mg/m3:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
Up to 1750 mg/m3:	Any SAR operated in a pressure-demand or other positive-pressure mode.
Emergency or Planned	Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.
In Presence of Polycyclicaromatic Hydrocarbons:	
Based on NIOSH REL	at Concentrations Above the NIOSH REL, or Where There is No REL, at Any Detectable Concentration: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

CRYSTALLINE SILICA

CONCENTRATION	RESPIRATORY PROTECTION
Up to 0.5 mg/m^3:	Any Air-Purifying Respirator with a high-efficiency particulate filter.
Up to 1.25 mg/m^3:	Any Powered, Air-Purifying Respirator (PAPR) with a high-efficiency particulate filter, or any Supplied-Air Respirator (SAR) operated in a continuous-flow mode.
Up to 2.5 mg/m^3:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter.
Up to 25 mg/m^3:	Any SAR operated in a pressure-demand or other positive-pressure mode.
Emergency or Planned	Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

EYE PROTECTION: Wear safety goggles/glasses as appropriate for the task if dust or other particulates are present. Face shields are recommended if solutions are made. If necessary, refer to appropriate regulations.

HAND PROTECTION: Wash hands and wrists before putting on and after removing gloves. None needed under normal conditions of use and handling. Wear appropriate glove for work being done. Resistance of specific materials can vary from product to product. Evaluate resistance under conditions of use and maintain gloves carefully. Because all gloves are to some extent permeable and their permeability increases with time, they should be changed regularly or immediately if torn or punctured. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary refer to appropriate regulations.

SKIN PROTECTION: Use appropriate protective clothing for the task. Full-body chemical protective clothing is recommended for emergency response procedures. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in appropriate regulations. If necessary, refer to the U.S. OSHA Technical Manual (Section VII: Personal Protective Equipment) or other appropriate regulations.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Finely divided, powdered solids
COLOR: Black, red, white or blue.
ODOR: Odorless.
ODOR THRESHOLD: Not applicable.
MOLECULAR FORMULA: Mixture.
MOLECULAR WEIGHT: Mixture.
RELATIVE VAPOR DENSITY (air = 1): Not established.
EVAPORATION RATE (n-BuAc = 1): Not established.
MELTING/FREEZING POINT: Not established.
BOILING POINT: Not established.
VAPOR PRESSURE: Not established.
pH: Not available.
FLAMMABILITY: Dusts may present ignition hazard.
DECOMPOSITION TEMPERATURE: 120°C (248°F)
SPECIFIC GRAVITY (water = 1): Black Chalk: 2.49-2.52; Blue Chalk: 2.60-2.62; Red Chalk: 3.1-3.3; White Chalk: 2.71
SOLUBILITY IN ORGANIC SOLVENTS: Not known.
SOLUBILITY IN WATER: Black and Blue Chalks: Insoluble. Red Chalk: 0.1%; White Chalk: Insoluble.
HOW TO DETECT THIS SUBSTANCE IN EVENT OF ACCIDENTAL SPILL (warning properties): The color of these products may be a method to identify them in event of an accidental spill.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Normally stable.
DECOMPOSITION PRODUCTS: *Combustion:* Thermal decomposition of this product can produce iron oxides, aluminum oxides, silicon dioxide, sulfur dioxide, magnesium, carbon and calcium oxides. The Blue Chalk may release hydrogen sulfide in contact with acids. *Hydrolysis:* None known.

10. STABILITY and REACTIVITY (Continued)

MATERIALS WITH WHICH PRODUCT IS INCOMPATIBLE: Calcium carbonate ignites on contact with fluorine. It is incompatible with acids, aluminum, and ammonium salts and mercury/hydrogen mixtures. Due to other components, these products may also be incompatible with formaldehyde, strong oxidizing agents, hydrofluoric acid, manganese trifluoride, sodium, and xenon hexafluoride.

POSSIBILITY OF HAZARDOUS REACTIONS/POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with light, extreme temperatures, and incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of industrial exposure to this product are by skin or eye contact and inhalation.

INHALATION: If dusts or particulates from these products are inhaled, irritation of the nose, throat, and lungs can occur. Symptoms may include sneezing, coughing, nasal congestion, and difficulty breathing. Symptoms are generally alleviated upon exposure to fresh air. If heated, chronic exposure to concentrations of silicon dioxide fume may cause chronic obstructive lung disease. Inhalation of iron oxide fume or dust is cause of pulmonary roentgenographic appearance called siderosis, or an accumulation of iron that leads to reduced lung capacity. These products contain Crystalline Silica, which is a known human carcinogen. Chronic inhalation exposure to this material may cause silicosis, pulmonary fibrosis, bronchitis or present a hazard of cancer, due to the presence of Crystalline Silica.

CONTACT WITH SKIN or EYES: Skin contact may cause abrasion, redness, and discomfort. Prolonged or repeated skin exposure may cause dermatitis (dry, red skin). Direct eye contact with these products may cause stinging, tearing, and redness. Dust can cause mechanical irritation to the eye. Repeated contact of iron dusts with the eyes can cause conjunctivitis, or can cause discoloration of the eyes.

SKIN ABSORPTION: This product does not pose a hazard of skin absorption.

INGESTION: Ingestion is an unlikely route of occupational exposure to this product. In the unlikely event that dusts from the product are ingested nausea, vomiting, and diarrhea may result.

Repeated ingestion of iron compounds can cause vomiting, diarrhea, pink urine, black stool, and liver or kidney damage. Repeated ingestion of iron compounds can also cause siderosis, which is an accumulation of iron in tissues.

INJECTION: These products do not pose a hazard of injection.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2*
FLAMMABILITY HAZARD	(RED)	1
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. In the event of exposure, the following symptoms may be observed:

Acute: Acute exposure to the skin and eyes can cause mechanical irritation. Inhalation of dusts can cause pulmonary irritation.

Chronic: Repeated inhalation exposure may cause adverse effects to the respiratory system. Chronic inhalation may result in pulmonary fibrosis. This product contains crystalline silica, which is a known human carcinogen.

HEALTH EFFECTS OR RISKS FROM EXPOSURE (continued):

TARGET ORGANS: Acute: Skin, eyes, respiratory system. Chronic: Skin, respiratory system.

TOXICITY DATA: Currently, toxicity data are available for the following components of these products:

LIMESTONE/CALCIUM CARBONATE:

TCLo (Inhalation-Rat) 84 mg/m^3/4 hohrs/40 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis (interstitial); Liver: other changes Kidney/Ureter/Bladder: other changes

TCLo (Inhalation-Rat) 250 mg/m^3/2 hours/24 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis)

CARBON BLACK:

LD_{50} (Oral-Rat) > 15,400 mg/kg: Behavioral: somnolence (general depressed activity)

LD_{50} (Skin-Rabbit) > 3 gm/kg

TDLo (Intravenous-Rat) 10 mg/kg/2 minutes: Liver: changes in liver weight; Blood: changes in spleen

TDLo (Intravenous-Rat) 10 mg/kg/2 minutes: Biochemical; Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)

TDLo (Skin-Rat) 11 gm/kg/4 weeks-intermittent: Blood: pigmented or nucleated red blood cells; Liver: changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Intratracheal-Rat) 16 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

CARBON BLACK (continued):

TDLo (Intratracheal-Rat) 15 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation)

TDLo (Intratracheal-Rat) 10 mg/kg: Lungs, Thorax, or Respiration: sputum; Biochemical: Metabolism (Intermediary): other proteins, effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Mouse) 20 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Mouse) 20 mg/kg/4 days-intermittent: Lungs, Thorax, or Respiration: sputum; Immunological Including Allergic: increase in cellular immune response; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Parenteral-Mouse) 36 µg/kg/3 days-intermittent: Immunological Including Allergic: increase in humoral immune response

TCLo (Inhalation-Rat) 7 mg/m^3: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

CARBON BLACK (continued):

TCLo (Inhalation-Rat) 1.66 mg/m^3/7 hours: Lungs, Thorax, or Respiration: sputum; Blood: changes in leukocyte (WBC) count; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m^3: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m^3/6 hours/90 days-intermittent: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Rat) 1 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 1 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes, changes in lung weight; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): other

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

CARBON BLACK (continued):

TCLo (Inhalation-Rat) 50 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): other, effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 7 mg/m3/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Mouse) 50 mg/m^3/6 hours: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified

TCLo (Inhalation-Mouse) 1 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Mouse) 1 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Lungs, Thorax, or Respiration: changes in lung weight; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Mouse) 7 mg/m^3/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Hamster) 7 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Hamster) 50 mg/m^3/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified

C.I. PIGMENT BLUE 29:

LD_{50} (Oral-Rat) 10 gm/kg

LD_{50} (Oral-Mouse) 10 gm/kg

TDLo (Oral-Rat) 450 mg/kg/90 days-continuous: Gastrointestinal: other changes; Kidney/Ureter/Bladder: other changes

CRYSTALLINE SILICA, CRYSTALLINE-QUARTZ:

LCLo (Inhalation-Human) 300 mg/m^3/10 years-intermittent: Systemic effects

TCLo (Inhalation-Human) 16 mppcf/8 hours/17.9 years-intermittent: Pulmonary system effects

TCLo (Inhalation-Rat) 58 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Endocrine: changes in thymus weight; Blood: changes in leukocyte (WBC) count

CRYSTALLINE SILICA, CRYSTALLINE-QUARTZ (continued):

TCLo (Inhalation-Rat) 50 mg/m^3/6 hours/71 weeks-intermittent: Carcinogenic effects

TCLo (Inhalation-Rat) 80 mg/m^3/26 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis); Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune

TCLo (Inhalation-Rat) 108 mg/m^3/6 hours/3 days-intermittent: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases, Metabolism (Intermediary): other proteins

TCLo (Inhalation-Mouse) 1475 μg/m^3/8 hours/21 weeks-intermittent: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Mouse) 4932 μg/m^3/24 hours/39 weeks-continuous: Endocrine: changes in spleen weight; Immunological Including Allergic: decrease in humoral immune response

TCLo (Inhalation-Guinea Pig) 28 mg/m^3/3 weeks-continuous: Lungs, Thorax, or Respiration: other changes, changes in lung weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other

TDLo (Intraperitoneal-Rat) 45 mg/kg: Carcinogenic effects

TDLo (Intratracheal-Rat) 90 mg/kg: Equivocal tumorigenic agent

TDLo (Intratracheal-Rat) 90 mg/kg: AR

TDLo (Intratracheal-Rat) 111 mg/kg: Carcinogenic effects

TDLo (Intratracheal-Rat) 111 mg/kg: AR

TDLo (Intratracheal-Rat) 100 mg/kg/19 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration: tumors

TDLo (Intrapleural-Rat) 90 mg/kg: Carcinogenic effects

TDLo (Intrapleural-Hamster) 83 mg/kg: Tumorigenic: neoplastic by RTECS criteria, tumors at site of application

TDLo (Implant-Rat) 900 mg/kg: Neoplastic effects

TDLo (Implant-Mouse) 4000 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney, Ureter, Bladder: tumors

TDLo (Implant-Mouse) 4000 mg/kg: Equivocal tumorigenic agent

TDLo (Intravenous-Rat) 90 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease

CRYSTALLINE SILICA, CRYSTALLINE-QUARTZ (continued):

TD (Intraperitoneal-Rat) 90 mg/kg/4 weeks-intermittent: Equivocal tumorigenic agent

TD (Intraperitoneal-Rat) 450 mg/kg/4 weeks-intermittent: Neoplastic effects

TD (Implant-Rat) 4554 mg/kg: Equivocal tumorigenic agent

TD (Intrapleural-Rat) 200 mg/kg: Equivocal tumorigenic agent

TD (Intrapleural-Rat) 100 mg/kg: Carcinogenic effects

TD (Intrapleural-Rat) 100 mg/kg: Neoplastic effects

TD (Intrapleural-Rat) 100 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis), tumors

LDLo (Intravenous-Rat) 90 mg/kg

LDLo (Intratracheal-Rat) 200 mg/kg

LDLo (Intravenous-Mouse) 40 mg/kg

LDLo (Intravenous-Dog, adult) 20 mg/kg

Micronucleus test (Human-Lung) 40 μg/cm^2

Micronucleus test (Hamster-Lung) 160 μg/cm^2

HEMATITE/IRON OXIDE:

TDLo (Intratracheal-Rat) 12 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TCLo (Inhalation-Rat) 3900 mg/m^3/6 hours/68 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis (interstitial)

TCLo (Inhalation-Dog) 3900 mg/m^3/6 hours/68 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis (interstitial)

MAGNESIUM CARBONATE/TALC:

LD_{50} (Oral-Rat) 7000 mg/kg

LD_{50} (Oral-Mouse) 8000 mg/kg

LD_{50} (Intraperitoneal-Mouse) 1033 mg/kg

TCLo (Inhalation-Rat) 76 mg/m^3/4 hours: Cardiac: pulse rate increase, without fall in BP; Liver: liver function tests impaired; Kidney/Ureter/Bladder: other changes in urine composition

TCLo (Inhalation-Rat) 76 mg/m^3/4 hours: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases

TDLo (Unreported-Mammal-Species Unspecified) 18,000 mg/kg/7 days-intermittent: Gastrointestinal: other changes; Related to Chronic Data: death

CARCINOGENIC POTENTIAL OF COMPONENTS: The components of these products are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

CARBON BLACK: ACGIH TLV-A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans); IARC-2B (Possibly Carcinogenic to Humans), MAK-3B (Substances for Which *in vitro* Tests or Animal Studies Have Yielded Evidence of Carcinogenic Effects that is Not Sufficient for Classification of the Substance in One of the Other Categories); In the Presence of PAHS: NIOSH-Ca (Potential Occupational Carcinogen, with No Further Categorization)

CRYSTALLINE SILICA: ACGIH TLV-A2 (Suspected Human Carcinogen); IARC-1 (Carcinogenic to Humans); Respirable: MAK-1 (Substances that Cause Cancer in Man and Can Be Assumed to Make a Significant Contribution to Cancer Risk); NIOSH-Ca (Potential Occupational Carcinogen, with No Further Categorization); Respirable: NTP-K (Known to Be a Human Carcinogen)

IRON OXIDE/HEMATITE: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans); MAK-3B (Substances for Which *in vitro* Tests or Animal Studies Have Yielded Evidence of Carcinogenic Effects that is Not Sufficient for Classification of the Substance in One of the Other Categories)

MAGNESIUM CARBONATE (TALC containing no asbestos fibers): ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans); Respirable: MAK-3B (Substances for Which *in vitro* Tests or Animal Studies Have Yielded Evidence of Carcinogenic Effects that is Not Sufficient for Classification of the Substance in One of the Other Categories)

The remaining components of this product are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, or ACGIH and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: These products may cause skin, eye and respiratory irritation.

SENSITIZATION TO THE PRODUCT: Components of these products are not known to cause human skin or respiratory sensitization.

REPRODUCTIVE TOXICITY INFORMATION: The components of these products are not known to cause human mutagenic, embryotoxic, teratogenic or reproductive toxicity in humans.

ACGIH BIOLOGICAL EXPOSURE INDICES: Currently, there are no ACGIH Biological Exposure Indices (BEIs) determined for the components of these products.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: These products have not been tested for mobility in soil; due to form they are not expected to be mobile.

PERSISTENCE AND BIODEGRADABILITY: These products have not been tested for persistence or biodegradability.

BIO-ACCUMULATION POTENTIAL: These products have not been tested for bio-accumulation potential.

ECOTOXICITY: These products have not been tested for aquatic or animal toxicity. All release to terrestrial, atmospheric and aquatic environments should be avoided.

12. ECOLOGICAL INFORMATION (Continued)

OTHER ADVERSE EFFECTS: The components of these products are not listed as having ozone depletion potential.
EFFECT OF CHEMICAL ON AQUATIC LIFE: These products have not been tested for aquatic toxicity. Releases of large quantities of this material may be detrimental to an aquatic environment.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.
U.S. EPA WASTE NUMBER: Not applicable.
EUROPEAN EWC CODE: Wastes Not Otherwise Specified: 16 10 99

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: These products are NOT classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: These products are NOT classified as Dangerous Goods, per regulations of Transport Canada.
INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): These products are NOT classified as Dangerous Goods, per rules of IATA.
INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION: These products are NOT classified as Dangerous Goods, per rules of IMO.
EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): These products are NOT classified by the United Nations Economic Commission for Europe to be dangerous goods.
TRANSPORT IN BULK ACCORDING TO THE IBC CODE: Not applicable.
ENVIRONMENTAL HAZARDS: These products do not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN); components are not specifically listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of these products are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.
U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of these products. The default Federal SDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) therefore applies, per 40 CFR 370.20.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.
U.S. TSCA INVENTORY STATUS: Components of these products are on the TSCA Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Crystalline Silica is on the California Proposition 65 lists. Carbon Black, with particles of respirable size, is on the Proposition 65 Lists as well. WARNING! These products contain compounds known to the State of California to cause cancer.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of these products are on the DSL Inventory.
OTHER CANADIAN REGULATIONS: Not applicable.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of these products are not on the CEPA Priority Substances Lists.
CANADIAN WHMIS CLASSIFICATION and SYMBOLS: Class D2A-Chronic Toxic Effects



ADDITIONAL EUROPEAN REGULATIONS:

SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE PRODUCT: None applicable.
CHEMICAL SAFETY ASSESSMENT: No Data Available. The chemical safety assessment is required for some substances according to European Union Regulation (EC) 1907/2006, Article 14.

16. OTHER INFORMATION

ANSI LABELING (Z129.1, Provided to Summarize Occupational Hazard Information): **CAUTION!** MAY CAUSE EYE AND RESPIRATORY TRACT IRRITATION. CONTAINS CRYSTALLINE SILICA, WHICH IS A KNOWN HUMAN CARCINOGEN; CONTAINS CARBON BLACK, WHICH IS A KNOWN ANIMAL CARCINOGEN. INGESTION MAY BE HARMFUL. Avoid breathing dusts. Avoid contact with skin, eyes, and clothing. Keep container closed. Use with adequate ventilation. Prevent dust accumulation. Wash thoroughly after handling. Wear gloves, goggles, dust mask, and appropriate body protection during operations that can generate dust.

16. OTHER INFORMATION (Continued)

ANSI LABELING (continued)): FIRST-AID: In case of contact, flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested do not induce vomiting. Get medical attention if adverse effects continue after exposure ends. IN CASE OF FIRE: Use water fog, dry chemical, CO_2, or "alcohol" foam. IN CASE OF SPILL: Sweep up spill, avoiding the generation of airborne dusts. Place residual in appropriate container and seal. Consult Safety Data Sheet for additional information.

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: Classified in accordance with CLP Regulation (EC) 1272/2008.

Classification: Carcinogenic Cat. 2

Signal Word: Warning

Hazard Statements: H351: Suspected of causing cancer. For Blue Chalk Only: EUH032: Contact with acids liberates very toxic gas (hydrogen sulfide).

Precautionary Statements:

Prevention: P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response: P308 + P313: IF exposed or concerned: Get medical advice/attention.

Storage: P405: Store locked up.

Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbol/Pictograms: GHS08

EU 67/548/EEC LABELING AND CLASSIFICATION: Classified in accordance with the European Community Council Directive 67/548/EEC or subsequent Directives.

Classification: Carcinogenic Cat. 3

Risk Phrases: R45: May cause cancer. For Blue Chalk Only: R32: Contact with acids liberates very toxic gas (hydrogen sulfide).

Safety Phrases: S(1/2): Keep locked up and out of the reach of children. (Can be omitted when product is for industrial use only). S22: Do not breathe dust. S25: Avoid contact with eyes. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S38: In case of insufficient ventilation wear suitable respiratory equipment. S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible). S53: Avoid exposure - obtain special instructions before use.

Hazard Symbol: Xn

CLASSIFICATION FOR COMPONENTS**:**

Full Text Global Harmonization AND EU CLP Regulation (EC) 1272/2008:

Crystalline Silica: This is a self-classification.

Classification: Carcinogenic Category 2

Hazard Statement Codes: H351: Suspected of causing cancer.

C.I. Pigment Blue 29: This is a self-classification.

Classification: None.

Hazard Statement Codes: EUH032: Contact with acids liberates very toxic gas (hydrogen sulfide).

All Other Components: No classification has been published or is applicable.

Full Text EU 67/548/EEC:

Crystalline Silica: This is a self-classification.

Classification: Carcinogenic Category 3

Risk Phrases: R45: May cause cancer.

Crystalline Silica: This is a self-classification.

Classification: None.

Risk Phrases: R32: Contact with acids liberates very toxic gas (hydrogen sulfide).

All Other Components: No classification has been published or is applicable.

PREPARED BY:	CHEMICAL SAFETY ASSOCIATES, Inc. PO Box 1961, Hilo, HI 96721 •(800) 441-3365
DATE OF PRINTING:	November 25, 2013
REVISION INFORMATION:	July 2010: Review of SDS and up-date. Format up-dated. Section 3 EU Crystalline Silica self-classification added. Section 8 Exposure limits up-dated. Section 11 Cancer ratings up-dated. Section 15 EU component classification added. July 2013: Review and revise entire SDS to add GHS compliance. Up-date Section 8 Exposure Limits. Section 11 Cancer ratings up-dated.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. DeWalt assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, DeWalt assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on an SDS. Some of these, which are commonly used, include the following:

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DFG MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances which have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form.

EXPOSURE LIMITS IN AIR (continued):

DFG MAK Germ Cell Mutagen Categories (continued): 3B: Substances which are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*; in exceptional cases, substances for which there are no *in vivo* data, but which are clearly mutagenic *in vitro* and structurally related to known in vivo mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

DEFINITIONS OF TERMS (Continued)

EXPOSURE LIMITS IN AIR (continued):

DFG MAK Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed.

DFG MAK Pregnancy Risk Group Classification (continued): Group B: Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. **Group C:** There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. **Group D:** Classification in one of the groups A-C is not yet possible because, although the data available may indicate a trend, they are not sufficient for final evaluation.

IDLH-Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

LOQ: Limit of Quantitation.

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH's Recommended Exposure Limits.

PEL-Permissible Exposure Limit: OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by Court Order.

SKIN: Used when a there is a danger of cutaneous absorption.

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

TLV-Threshold Limit Value: An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

TWA-Time Weighted Average: Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD: 0 (Minimal Hazard: No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation*: Essentially non-irritating. PII or Draize = "0". *Eye Irritation*: Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = "0". *Oral Toxicity LD_{50} Rat*: < 5000 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC_{50} Rat*: < 20 mg/L.); **1** (Slight Hazard: Minor reversible Injury may occur; slightly or mildly irritating. *Skin Irritation*: Slightly or mildly irritating. *Eye Irritation*: Slightly or mildly irritating. *Oral Toxicity LD_{50} Rat*: > 500-5000 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 1000-2000 mg/kg. *Inhalation Toxicity LC_{50}* 4-hrs *Rat*: > 2-20 mg/L);**2** (Moderate Hazard: Temporary or transitory injury may occur. *Skin Irritation*: Moderately irritating; primary irritant; sensitizer. PII or Draize > 0, < 5. *Eye Irritation*: Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD_{50} Rat*: > 50-500 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 200-1000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.5-2 mg/L.); **3** (Serious Hazard: Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation*: Severely irritating and/or corrosive; may destroy dermal tissue, cause skin burns, dermal necrosis. PII or Draize > 5-8 with destruction of tissue. *Eye Irritation*: Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD_{50} Rat*: > 1-50 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 20-200 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.05-0.5 mg/L.); **4** (Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposure. *Skin Irritation*: Not appropriate. Do not rate as a "4", based on skin irritation alone. *Eye Irritation*: Not appropriate. Do not rate as a "4", based on eye irritation alone. *Oral Toxicity LD_{50} Rat*: ≤ 1 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: ≤ 20 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: ≤ 0.05 mg/L).

FLAMMABILITY HAZARD: 0 (Minimal Hazard-Materials that will not burn in air when exposure to a temperature of 815.5°C [1500°F] for a period of 5 minutes.); **1** (Slight Hazard-Materials that must be pre-heated before ignition can occur. Material require considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur, Including: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C [200°F] (e.g. OSHA Class IIIB, or; Most ordinary combustible materials [e.g. wood, paper, etc.]; **2** (Moderate Hazard-Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres in air, Including: Liquids having a flash-point at or above 37.8°C [100°F]; Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; Solids and semisolids that readily give off flammable vapors.);

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 3 (Serious Hazard- Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 38°C [100°F] and below 37.8°C [100°F] [e.g. OSHA Class IB and IC]; Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]; Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]); **4** (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric]).

PHYSICAL HAZARD: 0 (*Water Reactivity*: Materials that do not react with water. *Organic Peroxides*: Materials that are normally stable, even under fire conditions and will not react with water. *Explosives*: Substances that are Non-Explosive. Unstable *Compressed Gases*: No Rating. *Pyrophorics*: No Rating. *Oxidizers*: No "0" rating allowed. *Unstable Reactives*: Substances that will not polymerize, decompose, condense or self-react.); **1** (*Water Reactivity*: Materials that change or decompose upon exposure to moisture. *Organic Peroxides*: Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. *Explosives*: Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases*: Pressure below OSHA definition. *Pyrophorics*: No Rating. *Oxidizers*: Packaging Group III; Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives*: Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.); **2** (*Water Reactivity*: Materials that may react violently with water. *Organic Peroxides*: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. *Explosives*: Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases*: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group II Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%)/cellulose mixture and the criteria for Packing Group I are not met. *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature);**3** (*Water Reactivity*: Materials that may form explosive reactions with water. *Organic Peroxides*: Materials that are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation; or materials that react explosively with water. *Explosives*: Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases*: Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group I Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3.:2 potassium bromate/cellulose mixture. Liquids: Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. *Unstable Reactives*: Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion.); **4** (*Water Reactivity*: Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides*: Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives*: Division 1.1 & 1.2-explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases*: No Rating. *Pyrophorics*: Add to the definition of Flammability "4". *Oxidizers*: No "4" rating. *Unstable Reactives*: Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a high potential to cause significant heat generation or explosion.).

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: **0** (materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials): Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 2000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 2000 mg/kg. Materials that are essentially non-irritating to the respiratory tract, eyes and skin. **1** (materials that, under emergency conditions, can cause significant irritation): Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 10 mg/L but less than or equal to 200 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. Materials that cause slight to moderate irritation to the respiratory tract, eyes and skin.

DEFINITIONS OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **2** (materials that, under emergency conditions, can cause temporary incapacitation or residual injury): Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 3,000 ppm but less than or equal to 5,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 2 mg/L but less than or equal to 10 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 200 mg/kg but less than or equal to 1000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. **3** (materials that, under emergency conditions, can cause serious or permanent injury): Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 1,000 ppm but less than or equal to 3,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. **4** (materials that, under emergency conditions, can be lethal): Gases and vapors whose LC_{50} for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD_{50} for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD_{50} for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 1000 ppm.

FLAMMABILITY HAZARD: **0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand: Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in according with Annex D. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. Liquids, solids and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the Method of Testing for Sustained Combustibility, per 49 CFR 173, Appendix H or the UN Recommendation on the Transport of Dangerous Goods, Model Regulations (current edition) and the related Manual of Tests and Criteria (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85 percent by weight. Liquids that have no fire point when tested by ASTM D 92 Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to a boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed up flash point of the solvent. Most ordinary combustible materials. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air: Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environmental conditions, can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily: Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air, Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500°C (932°F) when tested by differential scanning calorimetry. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **N**ational **F**ire **P**rotection **A**ssociation (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

ECOLOGICAL INFORMATION:

EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. $\mathbf{TL_m}$ = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log** $\mathbf{K_{ow}}$ or **log** $\mathbf{K_{oc}}$ and is used to assess a substance's behavior in the environment.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: $\mathbf{LD_{50}}$ - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; $\mathbf{LC_{50}}$ - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; $\mathbf{mg/m^3}$ concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

REGULATORY INFORMATION:

U.S. and CANADA:

ACGIH: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration.

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard 29 CFR 1910.1200.
This standard must be consulted for specific requirements.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Lithium-ion Battery - Rechargeable
Product Numbers:
#48-11-0490; V4B: Rated 4 volts, 0.8g ELC, 10 Watt-hours (Wh) maximum.
#48-11-1815; C18B; M18B; 982-2 (Albion); Li18 (OEM): 18v, 2.3g ELC, 27 Wh max.
#48-11-1820; M18B2: 18v, 3.0g ELC, 36 Wh max.
#48-11-1828; C18B; M18BX; Li18 (OEM): 18v, 4.5g ELC, 54 Wh max.
#48-11-1840; M18B4: 18v, 6.0g ELC, 72 Wh max.
#48-11-1830; V18B; MV18B: 18v, 4.5g ELC, 54 Wh max.
#48-11-2001; M4B2; 4V, 0.6g ELC, 8Wh max
#48-11-2401; C12B; M12B; 0700913615 (Wurth); 1004-3 (Albion); Li12B (OEM): 12v, 1.4g ELC, 18 Wh max.
#48-11-2420; M12B2: 12v, 1.8g ELC, 24 Wh max.
#48-11-2402; C12BX; M12BX; 0700913630 (Wurth); Li12BX (OEM): 12v, 2.7g ELC, 36 Wh max.
#48-11-2440; M12B4: 12v, 3.6g ELC, 48 Wh max.
#48-11-2830; V28B; M28BX; Li28V (Wurth); Li-2-28V (Wurth); Li28M (OEM): 28v, 6.3g ELC, 84 Wh max

Drawing Number: 58-97-0500
Issue Date: January 2013
Superseded Date: September 2012

Milwaukee Electric Tool Corporation
13135 West Lisbon Road
Brookfield, Wisconsin USA 53005-2550
www.milwaukeetool.com

Company Phone Number: 1-262-781-3600 or 1-800-729-3878
Emergency Contact Number: 1-800-424-9300 (Chemtrec)
(United States Only)
For International: 1-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- **Appearance/Odor:** Solid article, odorless
- **WARNING:** No exposure during routine handling of product. Hydrofluoric Acid Exposure During Fire Fighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.
- **Flammable:** Organic components will burn if cell is incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride.

- **Potential Health Effects:** Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations
- **Likely Routes of Exposure:** Eye contact, skin contact, skin absorption, inhalation. Hydrofluoric acid is extremely corrosive. Contact with hydrogen fluoride fumes is to be avoided. Permissible exposure limit is 3ppm. In case of contact with hydrogen fluoride fumes, immediately leave the area and seek first aid **and** emergency medical attention. Symptoms may have delayed onset. Fluoride ions penetrate skin readily causing destruction of deep tissue layers even bone. Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations. Immediately flush eyes or skin with water for at least 20 minutes to neutralize the acidity and remove some fluoride. Remove and destroy all contaminated clothing and permeable personal possessions. Before re-use, impermeable possessions should be soaked in benzalkonium chloride after washing. Following flushing of the affected areas, an iced aqueous solution of benzalkonium chloride or 2.5% calcium gluconate gel should be applied to react with the fluoride ion. Compresses and wraps may be used for areas where immersion is not practical. Medicated dressing should be changed every 2 minutes. Exposure to hydrofluoric acid fumes sufficient to cause pain requires immediate hospitalization for monitoring for pulmonary edema.

SECTION 3: COMPOSITION /INFORMATION OF INGREDIENTS

Ingredient	% by Weight	CAS #
Aluminum Foil	0.1 - 10	7429-90-5
Biphenyl (BP)	0.1 - 0.3	92-52-4
Copper Foil	0.1 - 10	7440-50-8
Linear & Cyclic Carbonate solvents	0 - 17	N/A
Graphite Powder/Carbon	10 - 30	7440-44-0
Metal Oxide or other Electrolyte (proprietary)	10 - 50	Confidential
Lithium Hexaflurophosphate ($LiPF_6$)	0 - 5	21324-40-3
Polyvinylidene Flouride (PVDF)	0.1 - 5	24937-79-9
Styrene Butadiene Rubber (SBR)	<5	N/A
Aluminum, Steel, Nickel and other inert materials	Remainder	N/A

SECTION 4: FIRST AID MEASURES

No exposure during routine handling of product. Risk of exposure occurs only if the battery is mechanically or electrically abused.

Eye Contact: Immediately flush with water for at least 15 minutes.
Skin Contact: Immediately flush with water for at least 15 minutes. Wash with soap and water
Inhalation: N/A
Ingestion: Ingestion is not likely, given the physical size and state of the cell.

SECTION 5: FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Water spray, carbon dioxide, dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials.

Unsuitable Extinguishing Media:

None.

Products of Combustion:

Organic components will burn if incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride. In case of fire in an adjacent area, use water, CO2, or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products.

Protection of Firefighters:

Hydrofluoric Acid Exposure During Fire Fighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Use standard industrial clothing in normal use. If handling large containers of cells wear steel-toed footwear.

Environmental Precautions:

No special precautions necessary.

Methods for Containment:

Transport container outdoors. Hold burned cells and fire cleanup solids for disposal as potential hazardous waste. Unburned cells are not hazardous waste. A fire with over 100 kg of cells burnt will likely require reporting to environmental officials. Always consult and obey all international, federal and local environmental laws.

Methods for Clean-Up:

Other Information:

SECTION 7: HANDLING AND STORAGE

Handling:

Use only approved charging equipment. Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.

Storage:

Store in a cool, dry place away from sparks and flame. Keep below 125°C. Keep above -60°C. Charge between 0°C and 45°C.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:	Not necessary under conditions of normal use
Engineering Controls:	Not necessary under conditions of normal use
Eye/Face Protection:	Not necessary under conditions of normal use
Skin Protection:	Not necessary under conditions of normal use
Respiratory Protection:	Not necessary under conditions of normal use
General Hygiene Considerations:	Not necessary under conditions of normal use

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Color:	N/A
Odor:	None
Odor Threshold:	None
Physical State:	Solid
pH:	N/A
Freezing Point:	N/A
Boiling Point:	N/A
Flash Point:	N/A
Evaporation Rate:	N/A
Flammability (solid,gas)	Organic components will burn if cell is incinerated.
Upper Flammability Limit:	N/A
Lower Flammability Limit:	N/A
Vapor Pressure:	N/A
Vapor Density:	N/A
Specific Gravity:	N/A
Solubilibty (water):	N/A
Partition Coefficient (n-octanol/water):	N/A
Auto-ignition Temperature:	N/A
Percent Volatile, wt. %:	N/A
Volatile Organic Compound (VOC) content, wt. %:	N/A

SECTION 10: STABILITY AND REACTIVITY

Stability:	Stable
Conditions to Avoid:	Do not crush, puncture, incinerate, immerse in water or heat over 212°F (100°C). Steel casing slowly dissolves in strong mineral acids.
Incompatible Materials:	Water, heat and strong acids
Hazardous Decomposition:	Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Manganese Oxides, Aluminum Oxide, possible fluoro-compounds, Carbon soot
Possibility of Hazardous Reactions:	Hazardous polymerization will not occur. Spontaneous decomposition will not occur at normal temperature.

SECTION 11: TOXICOLOGY INFORMATION

ACUTE EFFECTS:

Oral LD_{50}:	None in routine handling of product.
Dermal LD50:	None in routine handling of product.
Inhalation:	None in routine handling of product.
Eye Irritation:	None in routine handling of product.
Skin Irritation:	None in routine handling of product.
Sensitization:	None in routine handling of product.

CHRONIC EFFECT

Carcinogenicity:	None in routine handling of product.
Mutagenicity:	None in routine handling of product.
Reproductive Effects:	None in routine handling of product.
Developmental Effects:	None in routine handling of product.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity:	None in routine handling of product.
Persistence/Degradability:	None in routine handling of product.
Bioaccumulation/Accumulation:	None in routine handling of product.
Mobility in Environment:	None in routine handling of product.

SECTION 13: DISPOSAL CONSIDERATIONS:

Disposal:

Dispose in accordance with appropriate regulations. Always consult and obey all international, federal, provincial/state and local hazardous waste disposal laws. Some jurisdictions require recycling of this spent product. Battery recycling is encouraged. Lithium ion batteries are safe for disposal in the normal municipal waste stream since they are not defined by the federal government as hazardous waste. However, Lithium ion batteries are recyclable.

This product does not contain mercury, cadmium or Lithium (metal).

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F (100°C).

SECTION 14: TRANSPORTATION INFORMATION

U.S. DOT HMR (re: ground transport)

Proper Shipping Description:

UN3480 Lithium-ion batteries/UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9; PG II.

Milwaukee rechargeable Lithium-ion type batteries are “excepted” from full hazardous material regulation based on ELC content and/or Watt-hour (Wh)rating, and compliant packaging per 49 CFR 172.102, Special Provision 188.

Canada TDG (re: ground transport)

Proper Shipping Description:

UN3480 Lithium-ion batteries/UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9; PG II.

Milwaukee rechargeable Lithium-ion batteries are “excepted” from full dangerous goods regulation based on Watt-hour (Wh) rating, and compliant packaging per TDG Schedule 2, Special Provision 34.

International DGR (re: air, sea, ground transport)

Proper Shipping Description:

UN3480 Lithium-ion batteries/UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9; PG II.

Milwaukee rechargeable Lithium-ion batteries are “excepted” from full dangerous goods regulation based on Watt-hour (Wh) rating, and compliant packaging as described in the current editions of the following international Dangerous Good Regulations:

- ICAO Technical Instructions: Packing Instructions 965; 966; 967.
- IATA Dangerous Goods Regulations: Packing Instructions 965; 966; 967.
- IMDG Code: Special Provision 188.
- UN Model Regulations on the Transport of Dangerous Goods: Special Provision 188.
- UN European Agreements (ADR/RID/ADN): Special Provision 188.
- Australian Dangerous Goods (ADG): Special Provision 188.

UN Battery Testing:

Milwaukee rechargeable Lithium-ion batteries listed in Section 1 have passed the relevant transportation test requirements as described in the *UN Manual of Tests and Criteria*, Part III, section 38.3, “Lithium batteries”.

UN section 38.3 test reports are maintained on file at the corporate headquarters of Milwaukee Electric Tool Corporation located at 13135 W. Lisbon Rd., Brookfield, WI, USA 53005-2550.

SECTION 15: REGULATORY INFORMATION

Global Inventories

TSCA: United States	See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
DSL: Canada	See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
ECL: Korea	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
PICCS: Philippines	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
ENCS: Japan	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
AICS: Australia	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
IECS: China	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
EINECS: European Union	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.

SARA 313 Information:

SARA Title III Section 313: This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR part 372.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

WHMIS: Canadian Workplace

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements

SECTION 16: OTHER INFORMATION

NFPA 704: National Fire Protection Association

Health – N/A Fire – N/A Reactivity - N/A

0 = Minimal hazard, 1 = slight hazardous, 2 = moderate hazard, 3 = severe hazard

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. ***MILWAUKEE ELECTRIC TOOL CORPORATION*** makes no warranty, expressed or implied, regarding the accuracy of this data or the results to be obtained from the use thereto.

MATERIAL SAFETY DATA SHEET

Date Issued: 12/24/02

American Tool Companies, Inc.
Wilmington Division
92 Grant Street
Wilmington, Ohio 45177

Technical Contact: Jeff Curry
(937) 382-3811 (8:00-5:00 EST)

1. SUBSTANCE IDENTIFICATION

Substance Name:	**Strait-Line Marking Chalk 7 (Red)**
Description:	Powdered Chalk
General Use:	Refill for self-chalking chalk line reels

2. COMPOSITION/INGREDIENT INFORMATION

			Exposure Limit 8-Hour TWA (mg/m^3)		
Component	CAS No.	% by weight	OSHA PEL	ACGIH TLV	NIOSH REL
Calcium Carbonate (Limestone)	471-34-1; (1317-65-3)	75-85	15[1] 5[2]	10[1]	10[1] 5[2]
Red Iron Oxide	1332-37-2	10-20	10[1]	5[1]	
Magnesite	546-93-0	4-6	15[1] 5[2]	10[1]	15[1] 5[2]
Silica-Crystalline Quartz[3]	14808-60-7	0.01-3.0	2.0[2,4]	0.05[2]	0.05[2]

[1] Total dust.
[2] Respirable dust.
[3] Calcium carbonate may contain crystalline silica at levels between 0.01 and 4.0 % and varies naturally.
[4] Using the OSHA quartz formula, this PEL was calculated assuming a crystalline silica content of 3.0% in this ingredient.
TWA = Time-weighted average.

3. HAZARDS IDENTIFICATION

Hazardous Material Identification System (HMIS):
Health 1*, Flammability 0, Reactivity 0. *chronic effects

EMERGENCY OVERVIEW: Non-combustible red solid powder with no odor. Mildly irritating to eyes, skin, and respiratory system. Exposure to large quantities of this material may cause acute irritation of eyes and difficulty breathing.

POTENTIAL HEALTH EFFECTS: Exposure to Strait-Line Marking Chalk**7** is primarily through contact with dust from this material created during handling and use of the chalk. Acute health effects include minor irritation of the eyes, skin, and respiratory tract.

INHALATION: Acute exposure to dust levels above exposure limits (Section 2) may cause irritation of the respiratory system with sneezing and coughing.

EYE CONTACT: Contact with dust or powder may cause mechanical irritation and pain, watering of eyes, and eyelid inflammation.

SKIN CONTACT: When the product is used as intended, it is not considered to cause discomfort. Prolonged skin contact may produce moderate irritation.

INGESTION: Considered an unlikely route of entry in commercial/industrial environments. Small amounts of low dose rates are regarded as practically non-harmful. This material acts as a mild laxative. In excessive quantity, may cause stomach distension with pain.

CHRONIC: Repeated and prolonged inhalation exposure to crystalline silica dust above exposure limits may cause delayed, chronic lung injury (silicosis). Repeated and prolonged exposure to iron oxide dust may cause a benign pnuemoconiosis called siderosis. When the product is used as intended, dust levels should not exceed exposure limits. See Sections 2 and 11.

4. FIRST AID MEASURES

INHALATION: Remove exposed person to fresh air; restore and/or support his or her breathing as needed. Encourage the victim to cough, spit out, and blow nose to remove dust. Seek medical attention if irritation or discomfort persist.

EYE CONTACT: Rubbing eyes may cause abrasions. Gently lift the eyelids and flush immediately and continuously with copious amounts of water for at least 15 minutes. If irritation continues, seek medical attention.

SKIN CONTACT: Wet clothing first to minimize dust generation, then remove contaminated clothing. Do not shake or blow dust off clothing or body. Wash affected skin with soap and water. Launder contaminated clothing before wearing again. Seek medical attention in event of irritation.

INGESTION: Never give anything by mouth to an unconscious person. Rinse out mouth with plenty of water. If ingested, have that conscious person drink 2 to 3 glasses of water, do not induce vomiting. Consult with a physician or medically trained personnel at a poison control center.

5. FIRE-FIGHTING MEASURES

FLASHPOINT: None identified.

FLAMMABLE LIMITS: None identified.

AUTOIGNITION TEMPERATURE: None identified.

HAZARDOUS COMBUSTION PRODUCTS: None identified.

EXTINGUISHING MEDIA: This material is noncombustible. Use extinguishing agents that will put out the surrounding fire.

FIRE-FIGHTING INSTRUCTIONS: Special fire fighting procedures are not applicable.

6. ACCIDENTAL-RELEASE MEASURES

Notify safety and environmental personnel of spills or leaks. For large spills (e.g. more than 16 ounces), cleanup personnel need protection against eye contact and dust inhalation. Prevent spillage from entering sewers, or storm sewers, which includes sinks, toilets, and floor drains. Recover the product whenever possible. Avoid creating dust during cleanup. Shovel the material or use high-efficiency particulate air (H.E.P.A.) filtered vacuum, wet sweeping compound or water for cleanup so that airborne dust does not exceed exposure limits. **Do not dry sweep. Do not blow with air, which could cause a dusting problem**. Follow applicable OSHA regulations (29 CFR 1910.120).

7. HANDLING AND STORAGE

HANDLING: Store this material in a closed container and handle so as to minimize dusting or any material leaks. Practice good personal hygiene, (hand washing, etc.) after using this material. Keep containers securely closed when not in use.

STORAGE: No special requirements.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use sufficient general area ventilation. Local exhaust ventilation should be used if airborne levels of dust exceed the exposure limits cited in Section 2.

RESPIRATORY PROTECTION: When engineering controls are not sufficient to reduce exposure, seek professional advice prior to respirator selection and use. Wear NIOSH-approved respirator selected per OSHA 29 CFR 1910.134 to reduce concentrations inside the respirator below exposure limits cited in Section 2.

SKIN PROTECTION: No special equipment needed when handling small quantities, e.g. refilling chalk-line reel.

EYE PROTECTION: Wear protective eyeglasses or chemical safety goggles in windy conditions or where eye contact is possible, as required by OSHA regulations (29 CFR 1910.133).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Red
Physical State:	Powder
Odor:	None
pH: (at 10% solids)	7.5-8.5
Boiling Point:	Not applicable
Melting Point:	Decomposes at 1517EF (825EC)
Vapor Pressure (at 20EC):	Not applicable
Percent Volatile:	0
Vapor Density (Air=1):	Not applicable
Solubility in Water:	<0.0002 (Trace)
Octanol/Water Partition Coefficient:	Not applicable
Specific Gravity (H_2O=1):	2.9-3.0
Volatile organic compound (VOC) content:	0 percent

10. STABILITY AND REACTIVITY

GENERAL: This product is stable under normal storage and handling conditions.

CONDITIONS TO AVOID: Not applicable

CHEMICAL INCOMPATIBILITIES: Hydrazine, calcium hypochlorite, performic acid and bromine pentafluoride. Ignites on contact with fluorine. Reacts with strong acids to liberate carbon dioxide.

HAZARDOUS DECOMPOSITION PRODUCTS: None Identified

HAZARDOUS POLYMERIZATION: Does not occur.

11. TOXICOLOGICAL INFORMATION

Note: Toxicologic effects described in this section are those that would be expected based on data for the components of the product.

EYE: (Calcium Carbonate)
Rabbit: 0.750 mg administered for 24 hours produces severe irritation.

SKIN: (Calcium Carbonate)
Rabbit: 500 mg administered for 24 hours produces moderate skin irritation.

INGESTION: (Calcium Carbonate) Rat: LD_{50}: 6,450 mg/kg.
(Red Iron Oxide) Rat: LD_{50}: over 5,000 mg/kg.

INHALATION: (Silica, Crystalline-Quartz)
Human: LC_{Lo}: 300 µg/m^3 intermittent exposure over a 10-year period produced pulmonary system effects.

TARGET ORGANS: Eyes, respiratory tract, and skin.

CHRONIC/CARCINOGENICITY: The International Agency for Research on Cancer (IARC) has designated Silica, Crystalline-Quartz: Group 1A, carcinogenic to humans; National Toxicology Program (NTP), Group K, known to be a human carcinogen.

TERATOLOGY: No data.

REPRODUCTION: No data.

MUTAGENICITY: No data.

12. ECOLOGICAL INFORMATION

Limestone and other ingredients are not classified as a "toxic pollutant" or a "hazardous substance" under Section 307 and 311 of the Clean Water Act.

13. DISPOSAL CONSIDERATIONS

RCRA Hazardous Waste (40 CFR 261): This material is not a listed waste. Review Federal, state and local government requirements prior to disposal. Do not dispose of the product in storm sewer or sanitary sewer, which includes sinks, toilets, and floor drains. Disposal by landfill may be acceptable.

Consult an expert on the disposal of recovered material. Ensure conformity with Federal, state, and local disposal regulations.

14. TRANSPORT INFORMATION (NOT MEANT TO BE ALL INCLUSIVE) (49 CFR 172.101-2)

Department of Transportation (DOT) hazard class: Non-regulated material.
International Air Transport Association (IATA) hazard class: Non-regulated material.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA: Ingredients are listed as air contaminants (29 CFR 1910.1000). Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

TSCA (Toxic Substance Control Act): All components of this product are listed on the TSCA inventory.

CERCLA: Hazardous Substance, (40 CFR 302.4): Not Listed.

.

Extremely Hazardous Substance (40 CFR 355): Not Listed

SARA Hazard Category: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following category: "An immediate (acute) and chronic health hazard."

Chemicals subject to the reporting requirements of Section 313 or Title III of SARA and 40 CFR Part 372: None.

STATE REGULATIONS: California's "Safe Drinking Water and Toxic Enforcement Act of 1986" (Proposition 65).

This product contains the following Proposition 65 regulated materials known to the State of California to cause cancer or reproductive harm. The listed typical amounts are a result of their natural presence in the raw materials from which this product is produced.

arsenic	less than 2 parts per million (ppm)
lead	less than 4 ppm
nickel	less than 15 ppm
silica-crystalline quartz	less than 3.0 percent

16. OTHER INFORMATION

MSDS Status: This MSDS replaces the version dated 12/20/99. Sections 2, 3, 4, 6, 7, 8, 11, 15, and 16 have been revised.

To the best of our knowledge, the information contained herein is accurate. However, neither American Tool Companies, Inc. nor any of its subsidiaries or contractors assume any liability whatsoever for the accuracy or completeness of this information. The information relates to this specific material. It may not be valid for this material if used in combination with other materials or in any process. The user is responsible for the suitability and completeness of this information for his/her own particular use.

Prepared by: Larry Verdier, CIH, CSP, Shaw Environmental, Inc.
for the American Tool Companies, Inc.

Safety Data Sheet

according to 29 CFR 1910.1200(g)

AC 100+ GOLD - Comp. A

1. Identification

Product identifier

AC 100+ GOLD - Comp. A

Recommended use of the chemical and restrictions on use

Use of the substance/mixture

Adhesive mortar for fastening elements A-component (resin)

Uses advised against

no restriction

Details of the supplier of the safety data sheet

Company name: DEWALT Industrial Tool Co.
Street: 701 East Joppa Road
Place: Towson, MD 21286 USA
Telephone: +1 800-524-3244 Telefax: +1 877-871-1965

Emergency phone number: CHEMTREC: 1-800-424-9300 (within Continental USA)
CHEMTREC: +1 703 527-3887 (outside USA)

2. Hazard(s) identification

Classification of the chemical

29 CFR Part 1910.1200

Hazard categories:
Respiratory or skin sensitization: Skin Sens. 1
Specific target organ toxicity single exposure: STOT SE 3
Hazard Statements:
May cause respiratory irritation
May cause an allergic skin reaction

Label elements

29 CFR Part 1910.1200

Signal word: Warning

Pictograms:



Hazard statements

May cause respiratory irritation
May cause an allergic skin reaction

Precautionary statements

Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
Store locked up.
Dispose of contents/container to to in accordance with local/regional/national/international regulation.

Hazards not otherwise classified

No information available.

3. Composition/information on ingredients

Mixtures

Hazardous components

CAS No	Components	Quantity
97-90-5	ethylene dimethacrylate	10-< 20 %
27813-02-1	Methacrylic acid, monoester with propane-1,2-diol	1 -< 10 %
14808-60-7	Quartz (< 10µm) *	1 -< 5 %
38668-48-3	1,1´-(p-Tolylimino)dipropan-2-ol	0,1 -< 1 %

Further Information

* This mixture includes a fine fraction of crystalline quartz. However, alveolar permeability can be ruled out as the quartz is irreversibly bound into the paste-like component and therefore not freely available. Subsequent drilling, grinding or other treatment can also not result in the free availability of this alveolar permeable quartz. Pursuant to Article 6 of CLP Regulation 1272/2008/EU classification and labelling as SLOT RE 2 is not required.
SVHC Liste (Candidate List of Substances of Very High Concern for authorization): substances are not contained or are below 0,1%.

4. First-aid measures

Description of first aid measures

General information

Take off immediately all contaminated clothing and wash it before reuse.

After inhalation

Provide fresh air. When in doubt or if symptoms are observed, get medical advice.

After contact with skin

Take off immediately all contaminated clothing and wash it before reuse.
Medical treatment necessary.

After contact with eyes

Rinse immediately carefully and thoroughly with eye-bath or water. In case of eye irritation consult an ophthalmologist.

After ingestion

Rinse mouth immediately and drink plenty of water.

Most important symptoms and effects, both acute and delayed

Allergic reactions

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Extinguishing powder
Water spray jet

Unsuitable extinguishing media

Full water jet

Specific hazards arising from the chemical

Pyrolysis products, toxic
Carbon monoxide.

Special protective equipment and precautions for fire-fighters

In case of fire and/or explosion do not breathe fumes.
Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately.
Do not allow entering drains or surface water.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Do not breathe gas/fumes/vapor/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment.

Environmental precautions

Do not allow to enter into surface water or drains.

Methods and material for containment and cleaning up

Take up mechanically. Treat the recovered material as prescribed in the section on waste disposal.

Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

7. Handling and storage

Precautions for safe handling

Advice on safe handling

Use only outdoors or in a well-ventilated area.
When using do not eat, drink or smoke.
Wash hands before breaks and after work.

Advice on protection against fire and explosion

No special fire protection measures are necessary.

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed.
Keep only in the original container in a cool, well-ventilated place.

Advice on storage compatibility

Do not use for products which come into contact with the food stuffs.

Further information on storage conditions

storage temperature : 5-25°C (41-77 F)

8. Exposure controls/personal protection

Control parameters

Exposure limits

CAS No.	Substance	ppm	mg/m³	f/cc	Category	Origin
14808-60-7	Silica, crystalline (as respirable dust)	-	0.05		TWA (8 h)	REL
14808-60-7	Silica, crystalline - alpha-quartz (respirable fraction)		0.025		TWA (8 h)	TLV
14808-60-7	Silica, crystalline quartz, respirable dust	(Z-3)	(Z-3)		TWA (8 h)	PEL

Exposure controls



Protective and hygiene measures

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection program. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink.

Eye/face protection

Wear eye/face protection.

Hand protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Wearing time with occasional contact (splashes): 0,4mm NBR (Nitrile rubber) >480min (EN 374)
Wearing time with permanent contact 0,5mm NBR (Nitrile rubber) >480min (EN 374)

Skin protection

Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state:	Paste
Color:	light beige

	Test method
pH-Value:	not determined
Changes in the physical state	
Melting point/freezing point:	not determined
Initial boiling point and boiling range:	not determined
Flash point:	not applicable
Flammability	
Solid:	not determined
Gas:	not applicable
Lower explosion limits:	not determined
Upper explosion limits:	not determined
Auto-ignition temperature	
Solid:	not determined
Gas:	not applicable
Decomposition temperature:	not determined
Oxidizing properties	
Not oxidizing.	
Vapor pressure:	not determined

Density (at 20 °C):	1,72 g/cm³
Water solubility:	insoluble

Solubility in other solvents

not determined

Partition coefficient:	not determined
Vapour density:	not determined
Evaporation rate:	not determined

Other information

Solid content:	not determined

10. Stability and reactivity

Reactivity

No hazardous reaction when handled and stored according to provisions.

Chemical stability

The product is stable under storage at normal ambient temperatures.

Possibility of hazardous reactions

No known hazardous reactions.

Conditions to avoid

none

Incompatible materials

No information available.

Hazardous decomposition products

No known hazardous decomposition products.

11. Toxicological information

Information on toxicological effects

Acute toxicity

CAS No	Components				
	Exposure route	Dose		Species	Source
27813-02-1	Methacrylic acid, monoester with propane-1,2-diol				
	oral	LD50	11200 mg/kg	Rat	
	dermal	LD50	> 5000 mg/kg	Rabbit	
38668-48-3	1,1´-(p-Tolylimino)dipropan-2-ol				
	oral	LD50	27,5 mg/kg	Rat	

Additional information on tests

This mixture is classified as hazardous according to regulation (EC) No. 1272/2008 [CLP].

Further information

The toxicity data listed pertaining to the ingredients are intended for those working in the medicinal professions, experts for occupational health and safety and toxicologists. The toxicity data pertaining to the ingredients were supplied by the manufacturers of raw materials.

12. Ecological information

Ecotoxicity

The product is not: Ecotoxic.

Persistence and degradability

The product has not been tested.

Bioaccumulative potential

The product has not been tested.

Mobility in soil

The product has not been tested.

Other adverse effects

No information available.

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

13. Disposal considerations

Waste treatment methods

Advice on disposal

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of waste according to applicable legislation.

Contaminated packaging

Non-contaminated packages may be recycled. Handle contaminated packages in the same way as the substance itself.

14. Transport information

US DOT 49 CFR 172.101

Proper shipping name: Not a hazardous material with respect to these transport regulations.

Marine transport (IMDG)

UN number:	No dangerous good in sense of this transport regulation.
UN proper shipping name:	No dangerous good in sense of this transport regulation.
Transport hazard class(es):	No dangerous good in sense of this transport regulation.
Packing group:	No dangerous good in sense of this transport regulation.

Air transport (ICAO)

UN number:	No dangerous good in sense of this transport regulation.
UN proper shipping name:	No dangerous good in sense of this transport regulation.
Transport hazard class(es):	No dangerous good in sense of this transport regulation.
Packing group:	No dangerous good in sense of this transport regulation.

Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

Special precautions for user

No information available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

15. Regulatory information

U.S. Regulations

National regulatory information

SARA Section 311/312 Hazards:
ethylene dimethacrylate (97-90-5): Immediate (acute) health hazard
Methacrylic acid, monoester with propane-1,2-diol (27813-02-1): Immediate (acute) health hazard
Quartz (< 10µm) * (14808-60-7): Delayed (chronic) health hazard
1,1´-(p-Tolylimino)dipropan-2-ol (38668-48-3): Immediate (acute) health hazard

State Regulations

Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65, State of California)

This product contains no chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

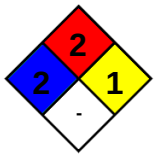
16. Other information

Hazardous Materials Information Label (HMIS)

Health:	2
Flammability:	2
Physical Hazard:	1
Personal Protection:	X

NFPA Hazard Ratings

Health:	2
Flammability:	2
Reactivity:	1
Unique Hazard:	-



Changes

Revision date:	08.08.2016
Revision No:	1,03,0

This data sheet contains changes from the previous version in section(s): 7,8.

Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route
(European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Other data

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)

Safety Data Sheet

according to 29 CFR 1910.1200(g)

AC 100+ GOLD - Comp. B

1. Identification

Product identifier

AC 100+ GOLD - Comp. B

Recommended use of the chemical and restrictions on use

Use of the substance/mixture

compound mortar B-component (hardener)

Uses advised against

no restriction

Details of the supplier of the safety data sheet

Company name: DEWALT Industrial Tool Co.
Street: 701 East Joppa Road
Place: Towson, MD 21286 USA
Telephone: +1 800-524-3244 Telefax: +1 877-871-1965

Emergency phone number: CHEMTREC: 1-800-424-9300 (within Continental USA)
CHEMTREC: +1 703 527-3887 (outside USA)

2. Hazard(s) identification

Classification of the chemical

29 CFR Part 1910.1200

Hazard categories:
Serious eye damage/eye irritation: Eye Irrit. 2A
Respiratory or skin sensitization: Skin Sens. 1
Specific target organ toxicity repeated or prolonged exposure: STOT RE 1
Hazard Statements:
Causes serious eye irritation
May cause an allergic skin reaction

Label elements

29 CFR Part 1910.1200

Signal word: Warning

Pictograms:



Hazard statements

Causes serious eye irritation
May cause an allergic skin reaction

Precautionary statements

Avoid breathing dust/fume/gas/mist/vapors/spray.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash contaminated clothing before reuse.
Dispose of contents/container to to in accordance with local/regional/national/international regulation.

Hazards not otherwise classified

This substance meets the PBT criteria of REACH, annex XIII.

3. Composition/information on ingredients

Mixtures

Hazardous components

CAS No	Components	Quantity
94-36-0	dibenzoyl peroxide; benzoyl peroxide	1-20 %
	Reaction mass of Diethylene glycole dibenzoate, Dipropylene glycole dibenzoate and Triethylene glycol dibenzoate	1-5 %
5444-75-7	2-Ethylhexyl benzoate	1-5 %
14808-60-7	Quartz (< 10µm) *	1-5 %

Further Information

* This mixture includes a fine fraction of crystalline quartz. However, alveolar permeability can be ruled out as the quartz is irreversibly bound into the paste-like component and therefore not freely available. Subsequent drilling, grinding or other treatment can also not result in the free availability of this alveolar permeable quartz. Pursuant to Article 6 of CLP Regulation 1272/2008/EU classification and labelling as SLOT RE 2 is not required.
SVHC Liste (Candidate List of Substances of Very High Concern for authorization): substances are not contained or are below 0,1%.

4. First-aid measures

Description of first aid measures

General information

Change contaminated, saturated clothing.

After inhalation

Provide fresh air. When in doubt or if symptoms are observed, get medical advice.

After contact with skin

After contact with skin, wash immediately with plenty of water and soap. Take off immediately all contaminated clothing and wash it before reuse. Medical treatment necessary.

After contact with eyes

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

After ingestion

Rinse mouth immediately and drink plenty of water.

Most important symptoms and effects, both acute and delayed

Allergic reactions

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings.
Extinguishing powder
Water spray jet

Unsuitable extinguishing media

Full water jet

Specific hazards arising from the chemical

Pyrolysis products, toxic
Carbon monoxide.

Special protective equipment and precautions for fire-fighters

In case of fire and/or explosion do not breathe fumes.
Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation.
Use personal protection equipment.
Special danger of slipping by leaking/spilling product.

Environmental precautions

Do not allow to enter into surface water or drains.
In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

Methods and material for containment and cleaning up

Take up mechanically.
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).
Treat the recovered material as prescribed in the section on waste disposal.

Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

7. Handling and storage

Precautions for safe handling

Advice on safe handling

Use only outdoors or in a well-ventilated area.
When using do not eat, drink or smoke.
Use protective skin cream before handling the product.

Advice on protection against fire and explosion

No special fire protection measures are necessary.

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed.
Keep/Store only in original container.

Advice on storage compatibility

Do not use for products which come into contact with the food stuffs.
Store in a well-ventilated place. Keep cool.

Further information on storage conditions

Keep container tightly closed in a cool place.
storage temperature 5-25°C (41-77 F)

8. Exposure controls/personal protection

Control parameters

Exposure limits

CAS No.	Substance	ppm	mg/m³	f/cc	Category	Origin
94-36-0	Benzoyl peroxide	-	5		TWA (8 h)	PEL
		-	5		TWA (8 h)	REL
14808-60-7	Silica, crystalline (as respirable dust)	-	0.05		TWA (8 h)	REL
14808-60-7	Silica, crystalline - alpha-quartz (respirable fraction)		0.025		TWA (8 h)	TLV
14808-60-7	Silica, crystalline quartz, respirable dust	(Z-3)	(Z-3)		TWA (8 h)	PEL
14808-60-7	Silica, crystalline quartz, total dust	-	(Z-3)		TWA (8 h)	PEL

Exposure controls




Protective and hygiene measures

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection program. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink.

Eye/face protection

Suitable eye protection:Wear eye/face protection.

Hand protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Wearing time with occasional contact (splashes): 0,4mm NBR (Nitrile rubber) >480min (EN 374)
Wearing time with permanent contact 0,5mm NBR (Nitrile rubber) >480min (EN 374)

Skin protection

Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state:	Paste
Color:	black
Odor:	characteristic

		Test method
pH-Value:	not applicable	

Changes in the physical state

Melting point/freezing point:	not determined
Initial boiling point and boiling range:	not determined
Flash point:	not applicable

Flammability

Solid:	not determined
Gas:	not applicable
Lower explosion limits:	not determined
Upper explosion limits:	not determined

Auto-ignition temperature

Solid:	not determined
Gas:	not applicable
Decomposition temperature:	not determined

Oxidizing properties

Not oxidizing.
Available oxygen content (%) < 1%
no classification

Vapor pressure:	not determined
Density (at 20 °C):	1,59 g/cm³
Water solubility:	insoluble

Solubility in other solvents

not determined

Partition coefficient:	not determined
Vapour density:	not determined
Evaporation rate:	not determined

Other information

Solid content:	not determined

10. Stability and reactivity

Reactivity

see section 10.3

Chemical stability

The product is stable under storage at normal ambient temperatures.

Possibility of hazardous reactions

Violent reaction with: Oxidising agent

Conditions to avoid

see section 7.2

Incompatible materials

Oxidizing agent, strong

Hazardous decomposition products

No known hazardous decomposition products.

11. Toxicological information

Information on toxicological effects

Acute toxicity

CAS No	Components			
	Exposure route	Dose	Species	Source
5444-75-7	2-Ethylhexyl benzoate			
	oral	LD50 > 2000 mg/kg	Rat	

Additional information on tests

This mixture is classified as hazardous according to regulation (EC) No. 1272/2008 [CLP].

12. Ecological information

Ecotoxicity

The product is not: Ecotoxic.

Persistence and degradability

The product has not been tested.

Bioaccumulative potential

The product has not been tested.

Mobility in soil

The product has not been tested.

Other adverse effects

No information available.

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

13. Disposal considerations

Waste treatment methods

Advice on disposal

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of waste according to applicable legislation.

Contaminated packaging

Non-contaminated packages may be recycled. Handle contaminated packages in the same way as the substance itself.

14. Transport information

US DOT 49 CFR 172.101

Proper shipping name: Not a hazardous material with respect to these transport regulations.

Marine transport (IMDG)

UN number: No dangerous good in sense of this transport regulation.

UN proper shipping name: No dangerous good in sense of this transport regulation.

Transport hazard class(es): No dangerous good in sense of this transport regulation.

Packing group: No dangerous good in sense of this transport regulation.

Air transport (ICAO)

UN number: No dangerous good in sense of this transport regulation.

UN proper shipping name: No dangerous good in sense of this transport regulation.

Transport hazard class(es): No dangerous good in sense of this transport regulation.

Packing group: No dangerous good in sense of this transport regulation.

Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

Special precautions for user

No information available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

15. Regulatory information

U.S. Regulations

National regulatory information

SARA Section 311/312 Hazards:
Benzoyl peroxide (94-36-0): Reactive, Immediate (acute) health hazard
Quartz (< 10µm) * (14808-60-7): Delayed (chronic) health hazard
SARA Section 313 Toxic release inventory:
Benzoyl peroxide (94-36-0): De minimis limit = 1.0 %, Reportable threshold = Standard

State Regulations

Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65, State of California)

This product contains no chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

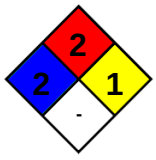
16. Other information

Hazardous Materials Information Label (HMIS)

Health:	2
Flammability:	2
Physical Hazard:	1
Personal Protection:	X

NFPA Hazard Ratings

Health:	2
Flammability:	2
Reactivity:	1
Unique Hazard:	-



Changes

Revision date:	25.05.2016
Revision No:	1,02,2

This data sheet contains changes from the previous version in section(s): 7,8,10.

Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route
(European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Other data

The above information describes exclusively the safety requirements of the product and is based on our

present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)

FLEX-ERECT

SECTION 24

SUBJECT: Silica Exposure Control Safety Program

REGULATORY STANDARDS: OSHA 29 CFR 1926.1153

GENERAL: Flex-Erect will ensure that the hazards associated with exposures to Silica are evaluated and that information concerning their hazards is transmitted to all employees. This Program is intended to address the issues of evaluating these potential hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

Section	Contents of the Silica Exposure Control Safety Program	Page
1	Purpose	2
2	Scope	2
3	Program Overview	2
4	Responsibilities	3
5	Enforcement	5
6	Medical Surveillance	6
7	Communication of Respirable Crystalline Silica Hazards to Employees	8
8	Compliance Options	10
9	Controlling Exposures	11
10	Restricted Access to Work Areas	11
11	Employee Notification of Monitoring Results	12
12	Observation of Monitoring	12
13	Respiratory Protection	12
14	Housekeeping	12
15	Training	13
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SILICA EXPOSURE CONTROL SAFETY PROGRAM

1. Purpose.

This program has been developed to protect site employees, who in the course of their work, may be exposed to various operations where the dust generated may contain respirable crystalline silica.
Objective.

This program has been established to ensure the health of employees who may encounter Silica in their work environment. And shall apply to all company sites where the presence of Silica is known or suspected and where employees may encounter these substances as part of their work activities.

Employees engaged in operations or activities where Silica may be encountered shall receive the proper procedures, training, and equipment necessary to protect themselves from harmful exposure to these materials.

This program applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m3) as an 8-hour time-weighted average (TWA) under any foreseeable conditions. **We shall ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of 50 µg/m3, calculated as an 8-hour TWA.**

2. Scope.

This section applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m3) as an 8-hour time weighted average (TWA) under any foreseeable conditions.

3. Program Overview.

Flex-Erect will:

A. Establish, implement, and maintain a **Written Exposure Control Plan** that identifies tasks that involve exposure to respirable silica and methods used to protect workers, including procedures to restrict access to work areas where high exposures may occur. Flex-Erect will evaluate all processes to determine if compliance using Table 1 in the OSHA silica standard **www.osha.gov/silica/SilicaConstructionRegText.pdf** or alternate control methods will be implemented.

B. Ensure that materials (e.g., tools, equipment, PPE) and other resources such as worker training materials required to fully implement and maintain this exposure control plan are readily available where and when they are required.

C. Provide a job/ **Written Exposure Control Plan** which details the work methods and practices that will be followed on each site. Considerations will include:

- Availability and delivery of all required tools/equipment
- Scope and nature of work to be conducted

- Control methods to be used
- Housekeeping
- Level of respiratory protection required
- Coordination plan

D. Designate a competent person to implement the written exposure control plan. Flex-Erect site supervision will be trained as competent persons under this plan.

E. Restrict housekeeping practices that expose workers to silica where feasible alternatives are available.

F. Initiate sampling of worker exposure to silica dust when there are non-standard work practices for which the control methods to be used have not been proven to be adequately protective

G. Offer medical exams—including chest X-rays and lung function tests—every three years for workers who are required by the standard to wear a respirator for 30 or more days per year.

H. Train supervisors and workers on work operations that result in silica exposure and ways to limit exposure.

I. Keep records of workers' silica exposure and medical exams.

J. Ensure site subcontractors provide written silica control plans prior to the commencement of any work that may result in the release of silica dust.

K. Maintain records of training, safety meetings, inspections, work methods, audits.

L. Conduct, at a minimum, annual reviews of this plan to ensure effectiveness. Any identified gaps or incidents may result in more frequent reviews.

4. Responsibilities.

A. The Safety Director is responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program.

B. The Safety Director will develop written detailed instructions covering each of the basic elements in this program, and is the person authorized to amend these instructions.

C. The Safety Director is responsible for ensuring the following program elements are implemented and maintained:

- Ensure **Written Exposure Control Plan** is current and details compliance requirements and acceptable industry practices through regular program reviews.
- Implement appropriate silica exposure monitoring program or ensure Table 1 of the OSHA Respirable Crystalline Silica Standard, 29 CFR 1926.1153 is applied.

- Ensure job/task/ **Written Exposure Control Plans** are developed and implemented appropriately (ex. Through inspections/verification visits).
- Review equipment and related technology advancements for consideration of implementation into current work practices (ex. Dust collection/suppression, vacuums, etc.)
- Ensure medical surveillance procedures are implemented and properly maintained.
- Ensure employee training/education related to silica, silica exposure and the requirements of this program are communicated effectively.
- Ensure job/site/task Specific Written Exposure Control Plans are effectively communicated to employees.
- Recordkeeping-maintain appropriate documentation related to this program (monitoring reports, training records, medical surveillance, inspections, etc.)
- Ensure competent persons responsible for implementation of this program make frequent and regular inspections of the job sites, materials, equipment and processes to implement the Written Exposure Control Plan.

D. **Superintendents/Project Managers** are responsible for silica exposure prevention on their job including:
   - Ensure workers are trained in accordance with this document and the requirements for prevention of silica exposure.
   - Obtain a copy of the exposure control plan from subcontractor employers.
   - Select/implement/direct/document the appropriate control measures for their respective job site.
   - Providing adequate instruction to workers on the hazards of working with silica-containing materials (ex: concrete) and on the precautions specified in the job-specific plan covering hazards at the location.
   - Ensure that workers are using the proper respirators and have been fit-tested with documented results.

E. **Competent Person(s)** will be responsible for ensuring the requirements of this program are in effect on their respective jobs. Competent person responsibilities include:
   - Identification of any known and/or anticipated respirable silica hazard related to a job or task.
   - Ensure the Written Exposure Control Plan has been created, communicated to all site personnel, and implemented effectively.
   - Conduct frequent inspections of the job sites, materials, equipment and processes and having the authority to initiate prompt corrective actions when necessary.

F. **Workers/Employees** are responsible for compliance with the silica exposure control plan. Specific responsibilities include:
   - Attending required orientation/training sessions that review silica producing tasks and associated hazards.
   - Using and maintaining assigned PPE for prevention of silica exposure.
   - Performing tasks/operations following the silica exposure prevention plan.

- Becoming familiarized with conditions or procedures that could potentially expose workers to silica.
- Notify site supervision if the work in which they are involved has not been properly evaluated for silica dust exposure or believe they have been exposed to silica dust.

G. **Subcontractor Companies** are expected to comply with the requirements of this program. Subcontractors who provide services/perform operations that generate airborne silica dust are required to provide Flex-Erect with their silica exposure control plan prior to the commencement of work.

5. Enforcement

Flex-Erect will ensure compliance with this program is maintained through frequent site evaluations and/or audits. Questions regarding requirements or compliance should be directed to the Safety Director. Flex-Erect reserves the right to remove any subcontractor/supplier/worker from the site for noncompliance with this program. **General Program Requirements**

A. HAZARD ASSESSMENT AND RISK IDENTIFICATION

Flex-Erect has completed an evaluation of project tasks and related materials that may expose a worker to respirable silica. The tasks and materials are identified below. ***This list identifies the most common tasks/materials used in commercial construction and should not be considered all inclusive.***

TASKS	**MATERIALS**
Abrasive blasting	Asphalt (for paving)
Cutting/sawing	Brick/masonry
Demolition	Cement
Drilling	Concrete
Earth moving	Fiber cement products
Grinding	Grout
Jackhammering	Gunite/Shotcrete
Milling	Mortar
Polishing	Paints containing silica
Mixing	Plaster
Sanding	Rock/stone
Sacking/patching	Refractory mortar/castables
Scarifying	Stucco
Scraping	Terrazo
Sweeping/cleaning up	
Pick and shovel work	
Glass cutting	
Tuck pointing	
Chipping	
Scabbling	
Installing concrete forms	

The competent person for each job site will conduct a silica exposure hazard assessment and generate a *site specific* **Written Exposure Control Plan** prior to the commencement of work.

The **Written Exposure Control Plan** will be reviewed with all employees prior to starting their work. Employees are required to follow the requirements of the Written Exposure Control Plan.

The **Written Exposure Control Plan** will include the following:

- A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
- A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task;
- A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica; and
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers.

The competent person will make frequent and regular inspections of job sites, materials, and equipment to ensure implementation and compliance with the **Written Exposure Control Plan**.

The plan will be updated as needed (change in processes/tasks/controls/tools)

Flex-Erect will review this policy and evaluate the effectiveness of the Written Exposure Control Plan at least annually and update it as necessary.

Flex-Erect will make the written exposure control plan readily available for examination and copying, upon request, to each employee covered by this section, their designated representatives, the Assistant Secretary and the Director.

6. Medical Surveillance.

A. PROGRAM REQUIREMENTS

A medical surveillance program shall be offered for employees who are exposed to respirable silica dust and required to wear a respirator at any time during a workday for 30 or more days per year. The medical surveillance program shall be offered using appropriate, local medical providers, during work hours, and at no cost to the employee. The medical surveillance program will include the following:

1. **Pre-employment and pre-placement medical examinations** – An initial (baseline) medical exam within 30 days after initial assignment shall be offered, unless the employee has received a previous medical examination that meets the requirements of this surveillance program within the last 3 years.

   The initial examination will consist of:

   a) A medical and work history with emphasis on past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system;

b) Any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;
c) An examination with special emphasis on the respiratory system;
d) A **chest X-ray** (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labor Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader;
e) A **pulmonary function test** to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;
f) Testing for **latent tuberculosis** infection;
g) Any other tests deemed appropriate by the physician or health care provider.
h) Appendix B

2. **Periodic medical examinations** – Physical examinations with special emphasis on the respiratory system, meeting the requirements of this medical surveillance program shall be offered at least every three years, or more frequently if recommended by a physician or other licensed health care professional.

3. **Information provided to the physician** –Flex-Erect will ensure that the examining physician or licensed health care provider has a copy of this standard as well as the following information:
   a) A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica;
   b) The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica;
   c) A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and
   d) Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the company.

4. **Medical reports** – Flex-Erect will ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed. The written report will contain:
   a) A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment;
   b) Any recommended limitations on the employee's use of respirators;
   c) Any recommended limitations on the employee's exposure to respirable crystalline silica; and
   d) A statement that the employee should be examined by a specialist if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

5. **Physician or Licensed Health Care Professional's Medical Opinion for Employer** – Flex-Erect will obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion will contain only the following:
   a) The date of the examination;
   b) A statement that the examination has met the requirements of the silica standard;
   c) Any recommended limitations on the employee's use of respirators.

   If the employee provides written authorization, the written opinion will also contain either or both of the following:
   a) Any recommended limitations on the employee's exposure to respirable crystalline silica;
   b) A statement that the employee should be examined by a specialist if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

   Flex-Erect will ensure that each employer receives a copy of the written medical opinion within 30 days of each medical examination performed.

6. **Additional examinations/follow up examinations with specialists** – If the PLHCP's written medical opinion indicates that an employee should be examined by a specialist, Flex-Erect will make available a medical examination by a specialist within 30 days after receiving the PLHCP's written opinion.
   a) Flex-Erect will ensure that the examining specialist is provided with the same information provided for the employee's initial examination;
   b) Flex-Erect will ensure that the specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report will meet the requirements of the standard and contain:
   - A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment;
   - Any recommended limitations on the employee's use of respirators;
   - Any recommended limitations on the employee's exposure to respirable crystalline silica.

7. **Specialist Physician's Medical Opinion for Employer** – Flex-Erect will obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion will contain only the following:
   a) The date of the examination,
   b) A statement that the examination has met the requirements of the silica standard,
   c) Any recommended limitations on the employee's use of respirators.

7. Communication of Respirable Crystalline Silica Hazards to Employees

A. HAZARD COMMUNICATION

Flex-Erect will ensure that each employee has access to labels on containers of crystalline silica and safety data sheets (SDS), and is trained in accordance with the provisions of HCS and the training requirements outlined in this policy.

B. DESCRIPTION OF SILICA

Silica is a one of several chemicals included in the larger classification of silicon dioxide (SiO2). Silicon dioxide is a chemical compound that includes crystalline silica (sand, quartz), amorphous silica (non-crystalline), and silicates (aluminum silicate). Crystalline silica is the basic component of sand, quartz, and granite rock. This form of silica is obtained from the earth's crust through mining. Crystalline silica can be processed into other materials including silica flour. Silica flouris produced through the milling of crystalline silica into a fine powder. Crystalline silica is present in several forms, including quartz, tridymite, and cristobalite

C. **SILICA RELATED HEALTH HAZARDS**

Exposure to respirable crystalline silica can occur in a variety of industries and occupations, including construction, sandblasting, and mining. Silicosis, an irreversible but preventable disease, is the illness most closely associated with occupational exposure to the material, which also is known as silica dust. Occupational exposures to respirable crystalline silica are associated with the development of silicosis, lung cancer, pulmonary tuberculosis, and airways diseases. These exposures may also be related to the development of autoimmune disorders, chronic renal disease, and other adverse health effects.

Onset of silicosis can be faster and the severity of disease worse in the setting of high level exposures, which can cause accelerated or acute silicosis.

- **Chronic silicosis** – Most common form, after 15–20 years of moderate to low exposures to respirable crystalline silica. Symptoms associated with chronic silicosis may or may not be obvious; therefore, workers need to have a chest x-ray to determine if there is lung damage. As the disease progresses, the worker may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. In the later stages, the worker may experience fatigue, extreme shortness of breath, chest pain, or respiratory failure.
- **Accelerated silicosis** – Onset 5-10 years after initial exposure to high concentrations of respirable crystalline silica. Symptoms include severe shortness of breath, weakness, and weight loss. The onset of symptoms takes longer than in acute silicosis.
- **Acute silicosis** – Quickly develops after a few months or as long as 2 years following exposures to extremely high concentrations of respirable crystalline silica. Symptoms of acute silicosis include severe disabling shortness of breath, weakness, and weight loss, which often leads to death.

Examples of occupations with known high silica exposure include: mining, quarrying, sandblasting, rock drilling, road construction, pottery making, stone masonry, and tunneling operations.

D. **PERSONAL HYGIENE**

- Use appropriate PPE provided for prevention of exposure to respirable crystalline silica-do not alter.
- Employee shall not have facial hair in a manner that will prevent a good seal between the respirator and face.
- Do not eat, drink, smoke, or apply cosmetics in areas where crystalline silica dust is present.
- Wash your hands and face outside of dusty areas before eating/drinking.

COMPLIANCE OPTIONS *NOTE: For tasks not listed in Table 1, or when the controls cannot be fully and properly implemented, the employer should refer to the options outlined in 29 CFR 1926.1153, section (d) "Alternative exposure control methods" to ensure workers are not exposed above the PEL.

8. Compliance Options.

Flex-Erect will evaluate each task/job process and determine the appropriate compliance approach to prevent employee exposure to respirable crystalline silica.

A. **Appendix A**– Lists of tasks and equipment control measures OSHA deems necessary to lower airborne respirable crystalline silica to acceptable levels. **Full implementation of Table 1 will remove the requirement of performing air monitoring for those tasks.**

Compliance with Table 1 requires fully and proper implementation of the specific control measures identified in the table including:

- Providing a means of exhaust for task performed indoors/enclosed areas.
- Applying water suppression minimize airborne dust.
- Utilizing closed cab equipment ensuring they are:
  - Free from settled dust
  - All seals work properly
  - Continuous delivery of fresh air circulated through 95% efficient filter
  - Heating and cooling systems.
- Ensuring employees performing multiple tasks on Table 1 are given proper respiratory protection throughout the day.

B. PERFORMANCE OPTION OR OBJECTIVE DATA – OSHA allows objective data to be used that demonstrates control measures being used reduce the airborne respirable crystalline silica exposure to below 50 µg/m3 per 8-hour time weighted average. Objective data would include air monitoring sampling/measurements conducted by the employer, gotten from sources such as other companies, tool manufacturers, universities, national databases, manufacturers, trade organizations, health organizations, etc and would closely mirror the employee exposure conditions for a specific task, process, or activity.

Compliance with the performance options requires:

- Any data collected for evidence under the performance option must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

C. SCHEDULED MONITORING OPTION – Requires the employer to perform air monitoring to evaluate the 8-hour time weighted average exposure of each employee and adhere to a monitoring schedule.

Compliance with the scheduled monitoring option requires:

- Conduct initial monitoring of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each task/job classification, in each work area.
- Conduct representative sampling for tasks/work areas where there are multiple employees doing the same job. Sample the employees who are expected to have the highest exposure to respirable crystalline silica.
- Initial monitoring that reflects exposures below the action level of 25 µg/m3, no additional monitoring is required.
- Recent monitoring results at or above the action level, but below the PEL, requires repeating the monitoring within 6 months.
- Recent monitoring results above the PEL, repeat monitoring within 3 months.
- If the most recent monitoring (non-initial) indicates that exposures are below the action level, repeat within 6 months until two consecutive measurements, taken seven days or more apart, are below the action level. Additional monitoring can be discontinued at this time.
- Reassessment of exposures should be initiated in the event of changes in processes, controls, personnel, or work practices that may be reasonably expected to result in new/additional exposures at or above the action level or when there is reason to believe a new/additional has occurred.

D. SAMPLE ANALYSIS

Flex-Erect ensure that all samples collected for monitoring respirable crystalline silica will be analyzed by laboratories meeting the requirements of Appendix A of OSHA's Silica rule, 29 CFR 1926.1153.

Flex-Erect obtain a statement from the laboratory stating that samples will be analyzed according to Appendix A of the standard.
https://www.osha.gov/silica/AppendixAtosect1926.1153.pdf

9. Controlling Exposures

A. ENGINEERING AND WORK PRACTICE CONTROLS

Flex-Erect will implement the use of engineering and work practice controls to ensure employee exposures to respirable crystalline silica to or below the PEL, or as outline in Table 1, unless it can be proven that such controls are not feasible.

When engineering and work practice controls are not sufficient alone to bring employee exposures to or below the PEL, Flex-Erect will supplement the controls with the use of respiratory protection.

10. Restricted Access to Work Areas

Flex-Erect will ensure access is restricted to areas where work being performed may generate dust containing silica.

- These work areas will be identified using either warning signs or hard barriers.
- Tasks being performed that produce dust containing silica should be scheduled appropriately as to minimize exposures to adjacent workers.
- Nonessential and unprotected workers should be informed to stay away from the work area.

- Personnel having to enter the work area should be advised that a respirator is required in areas where silica dust levels may be above the PEL.

11. Employee Notification of Monitoring Results

Within 5 working days of completing a silica exposure assessment (results have been received from a laboratory) Flex-Erect will notify in writing, all affected employees either individually or by posting of results in a conspicuous location.

Monitoring results indicating that exposures are above the PEL, Flex-Erect will describe in the written notice the corrective actions being taken to reduce the exposure to or below the PEL.

12. Observation of Monitoring

Flex-Erect will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to crystalline silica when being conducted to comply with requirements of the standard.

In the event the monitoring is conducted in an area where protective clothing or equipment is required, Flex-Erect will provide observers with protective clothing and equipment at no cost. Additionally, Flex-Erect will ensure the use of protective clothing and equipment by observers.

13. Respiratory Protection

Flex-Erect will ensure appropriate respiratory protection will be provided to employees when:

- Specified by Table 1
- For tasks not listed in Table 1
- When engineering and work practice controls specified by Table 1 are not fully implemented.
- Where exposures exceed the PEL during periods necessary to install/implement feasible engineering and work practice controls
- Where exposures exceed the PEL during tasks such as maintenance/repair when engineering and work practice controls are not feasible;
- Where all feasible engineering and work practice controls are implemented and are not sufficient to reduce exposures to or below the PEL.

Respiratory protection program – Respiratory use for compliance with this program will be in accordance with 29 CFR 1910.134.

14. Housekeeping

Flex-Erect must follow requirements of this section where employees could be exposed to small respirable crystalline silica particles.

Flex-Erect does not engage in dry sweeping when such activity could contribute to exposure to respirable crystalline silica. Wet sweeping, floor sweep compounds, or filtered vacuuming will be used to minimize exposure to respirable crystalline silica, when feasible.

Employees are not to use compressed air to clean clothing or surfaces as such activities could contribute to exposure of respirable crystalline silica.

Employers are not required to follow the housekeeping requirements when cleaning ordinary soil, large debris, and non-silica containing materials such as saw dust.

15. Training

A. EMPLOYEE TRAINING

Flex-Erect will ensure employees are trained in and can demonstrate knowledge and understanding of this silica policy.

Training content will consist of:

- Health hazards associated with exposure to respirable crystalline silica.
- Workplace tasks that could expose workers to silica.
- Exposure control measures including engineering controls, work practices, and respiratory protection implemented by Flex-Erect.
- Designated competent persons-who they are, what they do.
- Description of the medical surveillance program and its purpose.
- Worker responsibilities related to prevention of exposure to respirable crystalline silica as outlined in this policy.

Flex-Erect will make a copy of the training information and documentation available at no cost to all affected workers.

B. COMPETENT PERSON TRAINING

Flex-Erect will ensure competent persons responsible for implementation of control measures and work practice activities outlined in the policy receive training to include:

- Review of Flex-Erect policy related to prevention of exposure to respirable crystalline silica
- Health hazards associated with exposure to respirable crystalline silica
- Workplace tasks that could expose workers to silica
- What is the action level?
- What is the PEL?
- Exposure control measures including engineering controls, work practices, and respiratory protection
- Worker training requirements
- Housekeeping
- Personal hygiene
- Restricted work areas
- PPE
- What is exposure monitoring?
- How to create a written exposure control plan

16. Recordkeeping

A. AIR MONITORING/SAMPLING

Flex-Erect will make and maintain an accurate record of all objective data relied upon to comply with the requirement of this section.
This record shall include at the least the following information:

- The date of measurement for each sample taken;
- The task monitored
- Sampling and analytical methods used;
- Number, duration, and results of samples taken;
- Identity of the laboratory that performed the analysis;
- Type of personal protective equipment, such as respirators, worn by the employees monitored;
- Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were monitored.

Flex-Erect will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020.

B. OBJECTIVE DATA

Flex-Erect will make and maintain an accurate record of all objective data relied upon to comply with the requirements of this section.

This record shall include at the least the following information:

- The crystalline silica – containing material in question;
- The source of the objective data;
- The testing protocol and result of testing;
- A description of the process, task, or activity on which the objective data were based;
- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

Flex-Erect. will ensure that objective data is maintained and made available in accordance with 1910.1020.

C. MEDICAL SURVEILLANCE

Flex-Erect will make and maintain an accurate record for each employee covered by medical surveillance as described below.

This record shall include the following information about the employee:

- Name and social security number;
- A copy of the PLHCPs' and specialists written opinions; and
- A copy of the information provided to the PLHCPs and specialists

Flex-Erect will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020.

D. EMPLOYEE TRAINING

Flex-Erect will make and maintain, an accurate record of each employee trained and covered by this policy. The training record shall include:

- Name
- Date of training
- Employer (if subcontractor)
- Trainer Name
- Content of training/topic

17. Definitions.

Action Level – a concentration of airborne respirable crystalline silica of 25µg/m3, calculated as an 8 hour TWA.

Assistant Secretary – the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

B Reader - A "B" reader is a physician certified by the National Institute for Occupational Safety and Health (NIOSH) as demonstrating proficiency in classifying radiographs of the pneumoconiosis.

Competent person – an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in standard.

Director – the Director of the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.

Employee exposure – the exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.

Exposure Assessment – The initial determination to find if any employee may be exposed to respirable crystalline silica at or above the permissible exposure level. Until the assessment is completed, employees will take all precautions necessary to maintain exposures below the PEL.

High efficiency particulate filter – a filter that is at least 99% or greater efficiency in removing mono-dispersed particles of 0.3 micrometers in diameter. Dust collectors such as a shroud shall use a high efficiency filter and a filter cleaning mechanism while vacuums shall use a HEPA filter with 99.97% efficiency when cleaning up the work area.

Objective data-information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

Permissible exposure limit (PEL) – The employer will ensure that no employee is exposed to an

airborne concentration of respirable crystalline silica in excess of 50µg/m3, calculated as an 8-hour TWA.

Physician or other licensed health care professional [PLHCP] – an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all the particular health care services required by this standard.

Respirable crystalline silica – is 100 times smaller than a piece of sand (invisible dust), quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality – Particle Size Fraction Definitions for Health-Related Sampling.

Silica containing material – Any material, which has the potential to contain silica at levels, which may pose a hazard to employees when the material is manipulated to create airborne particles.

Specialist – an American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine. Exposure Control Methods.

18. Forms

#	Form Name	Page #
1	**Written Exposure Control Plan for Mitigating Silica within the Workplace**	**17**
2	**Table 1: Specified Exposure Control Methods when working with Materials Containing Crystalline Silica**	**19**
3	**Medical Surveillance Report**	**26**

Written Exposure Control Plan for Mitigating Silica within the Workplace

Project Name: _____ Project No.: _____

Address: _____

Competent Person: _____

Date: _____Time: _____

Source of respirable silica: _____

_____

_____

Description of task that may be affected by identified silica: _____

_____

_____

Personnel on the task or working in affected area:		**Trained in Silica:**	
1	_____	Y	N
2	_____	Y	N
3	_____	Y	N
4	_____	Y	N
5	_____	Y	N
6	_____	Y	N
7	_____	Y	N
8	_____	Y	N
9	_____	Y	N
10	_____	Y	N

Detailed description of method(s) used to protect worker(s) from exposure: _____

_____

_____

Housekeeping method(s) used to limit exposure: _____

_____

Method to restrict access to affected area: _____

_____

Respirator Protection: _____

_____

_____ _____

Competent Person Signature Date

_____ _____

Email Address Phone

Specified Exposure Control Methods when working with Materials Containing Crystalline Silica

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
(ii) Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. − When used outdoors. − When used indoors or in an enclosed area.	None APF 10	APF 10 APF 10
(iii) Handheld power saws for cutting fiber- cement board (with blade diameter of 8 inches or less)	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. − When used outdoors.	None APF 10	None APF 10

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
	− When used indoors or in an enclosed area.		
(v) Drivable saws	For tasks performed outdoors only: Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
(vi) Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	None	None
(viii) Dowel drilling rigs for concrete	For tasks performed outdoors only: Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	APF 10	APF 10
(ix) Vehicle-	Use dust collection system with close	None	None

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
mounted drilling rigs for rock and concrete	capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector. OR Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None
(x) Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. − When used outdoors. − When used indoors or in an enclosed area. OR Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. − When used outdoors. − When used indoors or in an enclosed area.	None APF 10 None APF 10	APF 10 APF 10 APF 10 APF 10
(xi) Handheld grinders for mortar removal (i.e., tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	APF 10	APF 25

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
(xii) Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism. − When used outdoors. − When used indoors or in an enclosed area.	None None None	None None APF
(xiii) Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use machine equipped with dust collection system recommended by the manufacturer.	None None	None None

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.		
(xiv) Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None
(xv) Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. For cuts of four inches in depth or less on any substrate: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. OR Use a machine equipped with supplemental water spray	None None None	None None None

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
	designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.		
(xvi) Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.	None	None
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab. When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None None	None None
(xviii) Heavy equipment and utility vehicles for tasks such as	Apply water and/or dust suppressants as necessary to minimize dust emissions. OR	None	None

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials	When the equipment operator is, the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

Medical Surveillance / Report

Name: _____ (Print clearly)

Employer: _____ (Print clearly)

Your employer has made available to your medical examination for exposure to crystalline silica at no cost to you. This medical examination could reveal a medical condition that results in recommendations for (1) limitations on respirator use, (2) limitations on exposure to crystalline silica, or (3) examination by a specialist in pulmonary disease or occupational medicine. The following results of this exam will be given to your employer:

(A) The date of the exam;
(B) A statement that the exam met the requirements of 29 CFR 1926.1153;
(C) Any limitation on your use of respirators.

☐ I hereby authorize Flex-Erect to provide the above medical surveillance as outlined in 29 CFR 1926.1153.
OR
☐ I hereby do not authorize Flex-Erect to provide the above medical surveillance as outlined in 29 CFR 1926.1153.

If you want your employer to know additional information concerning your crystalline silica exposure or recommendations for a specialist examination, you will need to give authorization for the written opinion to the employer to include one or both of those recommendations.

☐ I hereby authorize the opinion to Flex-Erect to contain the following information, if relevant (please initial all that apply):
- _____ Recommendations for limitations on crystalline silica exposure.
- _____ Recommendation for a specialist examination.

OR
☐ I do not authorize the opinion to the employer to contain anything other than recommended limitations on respirator use.

Please read and initial:

___ I understand that if I do not authorize my employer to receive the recommendation for specialist examination, the employer will not be responsible for arranging and covering costs of a specialist examination.

_____ _____
Signature Date

FLEX-ERECT

SECTION 25

SUBJECT: Electrical Safety Program

REGULATORY STANDARDS: OSHA 29 CFR 1910.331-335
OSHA 29 CFR 1926.1153

GENERAL: Flex-Erect attempts to ensure that work practices performed in proximity to energized electrical equipment are evaluated to determine if proper safety precautions are instituted. This program is intended to address the issues of evaluating and identifying potential energy sources where work is performed, evaluating the associated potential hazards, communicating information concerning these hazards, and establishing appropriate procedures, and protective measures for our employees. Issues that relate to the use of portable electrical tools, extension cords, or GFCI's are addressed in the Flex-Erect Equipment, Tools, and Ground Fault Safety Program.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erects where there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

Section	Contents of the Silica Exposure Control Safety Program	Page
1	Written Program	2
2	Training Requirements	2
3	Jobsite/Work Area Evaluation	2
4	Employee Notification	3
5	Safe Work Practices	3

ELECTRICAL SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program periodically, or when changes occur to the regulations or when operational changes occur that require a revision of this document. This written program will be communicated to all personnel that are affected by it.

1.1 General Requirement. This program will cover work performed by unqualified persons. **Flex-Erect Personnel are not authorized to conduct hot work.**

1.2 Flex-Erect not designated any qualified or authorized employees to perform work on exposed energized electrical equipment. In the event that a contractor's employees are required to perform work on energized electrical equipment or be involved in an operation where electrical hot work is being performed the following guidelines will be followed.

1.3 Job or Task Evaluation.

1.3.1 Electrical Hot Work Permits.

1.3.2 Safeguards for Personnel Protection.

1.3.3 Selection and Use of Safe Work Practices.

1.3.4 All applicable OSHA Regulations related to the specific work.

1.3.5 Hot work approval provided by the Safety Manager.

2. Training Requirements.

At a minimum, all employees of Flex-Erect will receive basic awareness training, which describes the hazards of electricity and importance of reporting those hazards to their Supervisors

2.1 Content of Training.

2.1.1 Employee job specific training (unqualified). Employees who are classified as "Unqualified Persons" (i.e., those not permitted to work near exposed energized parts) will also be trained in and become familiar with any related safety practices related to their jobs accordance with this program and the Flex-Erect Equipment, Tool, and Ground Fault Safety Program.

3. Jobsite/Work Area Evaluation.

Our supervisors will evaluate each jobsite or work area to determine where risk from electrical hazards exists.

3.1 When evaluating jobsites or work areas for electrical hazards Supervisors must consider the following:

3.1.1 Must the work be performed on exposed energized parts?

3.1.2 Must the work be performed where exposed energized parts are located?

3.1.3 Are all electrical panels or electrically energized parts properly guarded or covered?

3.1.4 Are Flex-Erect employees trained and familiar with the Flex-Erect Equipment,

Tool, and Ground Fault Safety program?

3.1.5 Are the ladders and tools that are going to be used insulated to protect personnel from accidental contact?

Note: All portable ladders shall have non-conductive side rails.

3.1.6 Does the work space with the exposed energized parts have adequate illumination to allow our personnel to work safely?

Note: Personnel are not allowed to enter work spaces with energized electrical components unless adequate illumination is provided.

3.1.7 Is the work space where the electrical hazard exists enclosed or a confined space?

Note: Protective shields, barriers, covers or insulating materials shall be used when working in a confined or enclosed work space that has electrical hazards.

3.1.8 Are our personnel wearing conductive apparel?

Note: Personnel shall not wear conductive apparel unless the electrical components are rendered non-conductive by covering, wrapping or other insulating means.

4. Employee Notification.

Our supervisors must ensure that employees are notified and protected from electrical hazards when a work area evaluation is conducted either by using one of the methods below or by any other equally effective means:

4.1 Safety signs and tags. Safety signs, safety symbols, or accident prevention tags will be used where necessary to warn employees about electrical hazards that may endanger them. A sign used for untrained employee/visitor notification must read, “DANGER ELECTRICAL HAZARD, AUTHORIZED PERSONNEL ONLY” or similar language in accordance with 29 CFR 1910.145.

4.2 Barricades. Barricades will be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.

4.3 If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant will be stationed to warn and protect employees.

5. Safe Work Practices.

Our supervisors will use the following safety-related work practices to prevent electric shock or injuries. This will be done whenever work is performed near equipment or circuits that are or may be

energized. The specific safety-related work practices will be consistent with the nature and extent of the associated electrical hazards.

5.1 De-energized parts. Live parts to which an employee may be exposed will be de-energized before the employee works on or near them. All exposed electrical parts (energized/ de-energized) will be treated as energized.

5.2 Lockout/Tagout. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits that energized the parts will be locked out or tagged or both in accordance with the Flex-Erect lockout/tag out program.

5.3 Overhead Lines. If work is to be performed near overhead lines, the lines will be de-energized and grounded, or other protective measures will be provided before work is started. If the lines are to be de-energized, arrangements will be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions will prevent employees from coming in direct contact with such lines with any part of their body or indirectly through conductive materials, tools, or equipment.

5.3.1 When an unqualified employee is working in an elevated position near overhead lines, the location will be such that the person and the longest conductive object he or she is using cannot come closer to any unguarded, energized overhead line than the following distances:

Distance	Line Rating
10	50 kilovolts or below
15	50 up to 200 kilovolts
20	200 up to 350 kilovolts
25	350 up to 500 kilovolts
35	500 up to 750 kilovolts
45	Over 750 up to 1000 kilovolts
Over 1000- Shall be established by the utility owner / operator or registered professional engineer who is a qualified person with respect to the electrical power transmission & distribution.	

5.3.2 When any vehicle, machinery, or mechanical equipment capable of having parts of its structure elevated near overhead lines shall be operated so that a clearance of 10’-0” is maintained at all times throughout the course of all operations. If the voltage is greater than 50kV, the clearance shall be increased 0’-4” for every 10kV over 50kV.

5.3.3 It shall be understood by all Flex-Erect Employees that ALL OVERHEAD POWER LINES shall be treated as energized lines no matter if the lines are energized or not energized.

5.4 Interlocks. Flex-Erect employees may not defeat electrical safety interlocks for any reason.

FLEX-ERECT

SECTION 26

SUBJECT: Disciplinary Program

GENERAL: Our Company is dedicated to providing a workplace free of safety and health hazards for our employees. In order to achieve this goal, every employee MUST comply with all Company Safety Policies and Procedures. Failure to do so, by any employee at any time, is to compromise our Company's objectives and to possibly endanger the welfare of fellow employees or yourself. Our Safety Policies, Procedures, and Training Requirements also comply with all applicable federal and/or state regulations.

Our Company also makes sure that every employee clearly knows and understands what is expected of them in the capacity as our employee, and in their specific job assignments. Our first emphasis is on education, training, and positive guidance. However, certain conditions and conduct may necessitate disciplinary measures. In those cases, the following disciplinary measure will apply. Nothing in this Program is intended to modify the employment relationship as all employees are at-will.

RESPONSIBILITY: Flex-Erect has authorized the Safety Manager, Project Manager, and any Supervisor to correct issues immediately by halting any unsafe action. Additionally, every employee has the responsibility and authority to stop an unsafe act or condition. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

Section	Contents of the Disciplinary Safety Program	Page
1	Policy Statement	2
2	Responsibilities	2
3	General Employee Conduct	2
4	Employee Misconduct	3
5	Serious Employee Misconduct	3
6	Inexcusable Employee Misconduct	4
7	Safety Violation Review Procedures	4
8	Forms	5

DISCIPLINARY PROGRAM

1. Policy Statement.

As a term and condition of employment and/or the privilege of entering onto or remaining on company premises, or performing company work, or operating company vehicles or company equipment, all employees are subject to the company disciplinary program.

2. Responsibilities.

2.1 Safety Manager

2.1.1 The Safety Manager shall ensure the Disciplinary Program has been provided and reviewed with all company personnel.

2.1.2 The Safety Manager shall ensure periodic documented physical inspections of project sites are being conducted to ensure compliance with Company Safety Policies and Procedures.

2.1.3 The Safety Manager shall ensure all managers and supervisors are trained and understand the Company Safety Policies and Procedures including the Disciplinary Program.

2.1.4 The Safety Manager shall ensure all employees have been trained on the Company Safety Policy and Procedures including the Disciplinary Program.

2.2 Manager

2.2.1 The Manager shall ensure physical inspections of work areas are being conducted to ensure compliance with Company Safety Policies and Procedures.

2.2.2 The Manager shall help facilitate periodic documented physical inspections of project sites by The Safety Manager to ensure compliance with Company Safety Policies and Procedures.

2.2.3 The Managers shall ensure that Supervisors are completing corrective actions in respect to the documented inspections of the project sites.

2.3 Supervisor

2.3.1 Supervisors must ensure employees have reviewed and understand the Company Safety Policy and Procedures including the Disciplinary Program.

2.3.2 Supervisors shall ensure physical inspections of work areas are being conducted to ensure compliance with safety rules and policies.

2.3.3 Supervisors shall execute the disciplinary program as outlined.

2.3.4 Supervisors shall ensure that corrective actions are completed in respect to the documented inspections of the project sites.

2.4 Employee

2.4.1 All employees are responsible for complying with the Company Safety Policies and Procedures and will be subject to the Company's Disciplinary Program.

3. General Employee Conduct. Employees are expected to perform in a safe, professional, and courteous manner at all times. The following infractions, while not exhaustive, may result in

discipline:

3.1 Personnel not conducting physical inspections of their work areas;

3.2 Inefficient or careless performance of duties;

3.3 Failure to protect from negligent damage, to maintain in proper working order, and to inspect company issued Fall Protection Equipment. Including harnesses, lanyards, retractable fall arrest devices;

3.4 Altering, removing, or destroying safety records or inspection reports;

3.5 Deliberate or careless damage to company owned vehicles, tools, equipment, or safety equipment, whether issues to the employee or maintained by the company;

3.6 Engaging in any conduct, which could endanger the safety, life, or health of others;

3.7 Personal advances and/or physical contact with other employees or persons, which is not in keeping with job duties and responsibilities or is outside the bounds of acceptable behavior in a business setting, including sexual harassment or harassment based on any other protected characteristic. Refer to the Flex-Erect Employee Handbook for additional requirements for Anti-Discrimination/Anti-Harassment policies;

3.8 Failure to comply with Company Safety Policies and Procedures;

3.9 Refusing to take a random drug test; and

3.10 Possession of firearms or other weapons on Company or customer property.

4. Employee Misconduct Relating to Violations of the Company Safety Program, Employees may be subject to discipline for general safety violations, including, but not limited to:

4.1 Failure to report unsafe acts or conditions that may lead to or result in injury. **Note: No employee will be subjected to retaliation for reporting a workplace injury.**

4.2 Failure to use personal protective equipment.

4.3 Disciplinary Action

- **FIRST VIOLATION:** Verbal Warning and meeting with employee to discuss the improper conduct.

  Within 5 business days the Supervisor will document in writing the meeting with the employee. Employee will sign the document to demonstrate understanding of the issue and the corrective action. (Meeting documentation will be added to the employee's personnel file).

- **SECOND VIOLATION:** Written Warning or Documented Verbal Warning and possible re-training. (Warning will be documented and included in employee's personnel file).
- **THIRD VIOLATION:** Probation or Suspension, without pay, for up to 5 work days. (This discipline will also be recorded and included in the employee's personnel file).
- **FOURTH VIOLATION: IMMEDIATE TERMINATION**

5. Serious Employee Misconduct.

5.1 Misuse of company vehicles, equipment, and tools;

5.2 Speeding, reckless driving, or unauthorized use of company vehicles or equipment;

5.3 Intentional disabling of vehicle or equipment safety warning devices, safety mechanism, safety restraints, etc.;

5.4 Permanently or temporarily disabling or removing of safety features and protective guards on all tools used on company premises or on work sites; and

5.5 Flagrant disregard for Company Safety Policy and Procedures and/or Job Site Safety Policies and Procedures.

5.6 Disciplinary Action

- **FIRST VIOLATION:** Written Warning or Documented Verbal Warning and possible re-training. (Warning will be documented and included in the employee's personnel file).
- **SECOND VIOLATION:** Probation or Suspension, without pay, for up to 5 work days. (This discipline will also be documented and included in the employee's personnel file).
- **THIRD VIOLATION: IMMEDIATE TERMINATION**

6. Gross Misconduct.

6.1 Fighting on job site or company property;

6.2 Threatening or engaging in any act of violence on company property or job sites;

6.3 Theft of any item on project;

6.4 Reporting to work under the influence of alcohol or illegal drugs, possession, sale or use of illegal drugs or consumption of alcohol while working on job site, or company vehicles;

6.5 Gross negligence or willful acts in the performance of duties resulting in damage to company property or injury to others;

6.6 Willfully misusing company property; and

6.7 Repeated or serious violation of safety policies that creates imminent harm to employee or others in the workplace.

6.8 **Disciplinary Action**

- **FIRST VIOLATION**: Probation or Suspension, without pay, for up to 5 work days. (This discipline will also be documented and included in the employee's personnel file)
- **SECOND VIOLATION: TERMINATION**

NOTE: All safety violation disciplinary actions shall be coordinated with the safety director and Human Resources, to insure accurate and required documentation.

SPECIAL NOTE: Any of the above discipline measures are to be considered the MINIMUM for Safety Violations, and the Company reserves the right to escalate the level of the disciplinary action for any particular Safety Violation, as the impact of any single Safety Violation may have the potential to be devastating to individuals and/or Company. Therefore, even the First Safety Violation could result in Termination, depending on the circumstances. The Company shall be the sole judge in making such determinations.

7. Safety Violation Review Procedures.

7.1 The safety department and the project management team will meet to discuss personnel safety violations. The goal of the meeting is to identify the root cause of the safety violation and to develop a safety measure to prevent reoccurrence. This will include, but is not limited to:

7.1.1 New Safety Procedure Development

7.1.2 Personnel Safety Training

7.1.3 Positive Reinforcement

7.1.4 Personal Monitoring

8. Forms

#	Form Name	Page #
1	**Employee Disciplinary Action Form**	**6**

EMPLOYEE DISIPLINARY ACTION FORM

GENERAL

NAME: _____ EMPLOYEE #: _____ DATE _____
JOB TITLE: _____ DEPT.: _____ _____

TYPE OF VIOLATION

☐ ABSENTEEISM
☐ EXCESSIVE TARDINESS
☐ FAILURE TO CALL IN
☐ JOB ABANDOMENT
☐ UNAUTHORIZED LEAVING THE JOB
☐ FIGHTING / HORSEPLAY
☐ SLEEPING ON THE JOB
☐ ABUSE OF COMPANY TOOLS
☐ CONDUCT
☐ INSUBORDINATION
☐ OTHER: _____.
☐ PERFORMANCE
☐ QUALITY OF WORK
☐ SAFETY
☐ ADHERANCE TO COMPANY POLICIES & PROCEDURES

SEVERITY OF VIOLATION

☐ MINOR VIOLATION ☐ SERIOUS VIOLATION ☐ EXTREMELY SERIOUS VIOLATION

Explanation of Offense: _____

Expectation for Corrective Action: _____

ACTION TAKEN

☐ VERBAL WARNING ☐ WRITTEN WARNING/ SUSPENSION [ ] DAYS ☐ TERMINATION

Depending on severity and nature of the offense, M & I Electric, Inc. reserves the right to skip any step in the reprimand system at its discretion.

☐ I agree with the supervisor's statement. ☐ I do not agree with the supervisor's statement.

Employee Statement concerning the violation: _____

CONFIRMATION

By application of your signature below, you confirm that you have received a copy of this Disciplinary Action Form and understand the information contained herein. You also agree that unless this problem is corrected, further disciplinary action up to and including the termination of your employment may occur.

Employee's Signature: _____ **Date:** _____

Supervisor's Signature: _____ **Date:** _____

Witness's Signature: _____ **Date:** _____
If employee has been counseled and refuses to sign

EMPLOYEE TRAINING ACKNOWLEDGEMENT

Training Provided: Disciplinary Action for Violation of Safety Policies and Procedures

Date of Training: _____

I acknowledge that I have received training on the Flex-Erect Safety Policies and Procedures **Disciplinary Program**. I also understand that as an employee of Flex-Erect it is part of my job responsibilities to comply with all General Safety Policies and procedures.

I agree to abide by the regulations contained in the Safety Manual as well as all other company policies. Furthermore, I understand that my failure to follow these policies will result in disciplinary action and may result in termination of my employment.

_____

Print Employee Name

_____ _____

Employee Signature Date

RECONOCIMIENTO DE CAPACITACIÓN DE EMPLEADOS

Capacitación provista: acción disciplinaria por violación de políticas y procedimientos de seguridad

Fecha de entrenamiento: _____

Reconozco que he recibido capacitación sobre el **Programa de Disciplinaria** de Políticas y Procedimientos de Seguridad de Flex-Erect. También entiendo que, como empleado de Flex-Erect, es parte de mis responsabilidades laborales cumplir con todas las Políticas y procedimientos de seguridad general.

Estoy de acuerdo en cumplir con las regulaciones contenidas en el Manual de seguridad, así como con todas las demás políticas de la compañía. Además, entiendo que mi incumplimiento de estas políticas resultará en una acción disciplinaria y puede resultar en la terminación de mi empleo.

_____

Escriba el nombre del empleado

_____ _____

Firma del empleado Fecha

FLEX-ERECT

SECTION 27

SUBJECT: Extra Forms

FLEX-ERECT

Pre-Use Inspection for All Terain Forklift

Project Name: _____ **Inspection Completed By:** _____

Flex-Erect Project Number: _____ **Inpsection Date:** _____

Workplace Inspection

Description	Acceptable?		
	Yes	No	N/A
Drop Offs or Holes			
Bumps & Floor/Groumd Obstructions			
Debris			
Overhead Obstructions			
Energized Overhead Power Lines			
Ground Layed Power Lines			
Hazardous Locations			
Ground Surface & Support Condiditons			
Pedestrian/Vehicle Traffic			
Wind and Weather Conditions			

Other Possible Hazards

General Comments

Equipment Make/Model

Equipment Walk-Around Inspection (Visual)

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Walk-Around Inspection (warning decals, operators manual, capacity plate, etc.)			
Forks/Locking Pins, Carriage, Mast, Boom			
Wheels, Tires & Lub Nuts (Condition/Pressure)			
Engine (check oil level & visually inspect for leaks)			
Engine Belts (check for proper alignment & wear)			
Air Cleaner (present and clean, check service indicator)			
Radiator (check cold coolant level & visually inspect for leaks)			
Hydraulic Tank (check fluid level & visually check for leaks)			
Fuel (check fuel level and secure cap)			
Battery (check terminals, cables, and hold downs)			
Overhead Guard/ROPS (visually inspect for damage)			
Seatbelt (verify locking mechanism)			
Ignition (verify no tampering is present)			
Waring Flag (inplace & in good condition)			

Other Visual Inpsections

Start-Up Checks

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Engine (does it sound normal)			
Instruments (check for normal readings)			
Exhaust System (check for leaks & excessive smoke)			
Lights (verify function)			
Horn & Backup Alarm (verify function)			
Hydraulic Controls (normal operation - lift, tilt, etc.)			
Transmition and Clutch (direction & speed range)			
Brakes (parking brake operates & pedal brakes are functioning)			
Steering (all modes function)			
4wd (verify function)			

Other Start-Up Inspections

General Comments on Equipment

Service Required

Equipment Notes

FLEX-ERECT

Pre-Use Inspection for Aerial Boom Lift

Project Name: _____ **Inspection Completed By:** _____

Flex-Erect Project Number: _____ **Inpsection Date:** _____

Workplace Inspection

Description	Acceptable?		
	Yes	No	N/A
Drop Offs or Holes			
Bumps & Floor/Groumd Obstructions			
Debris			
Overhead Obstructions			
Energized Overhead Power Lines			
Ground Layed Power Lines			
Hazardous Locations			
Ground Surface & Support Condiditons			
Pedestrian/Vehicle Traffic			
Wind and Weather Conditions			
Other Possible Hazards			
General Comments			
Equipment Make/Model			

Equipment Walk-Around Inspection (Visual)

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Wheels, Tires, & Axles (condition/inflation)			
Hydraulic Components/Boom Valley (leaks, levels, debris, cylinders, pins/locks)			
Data Plate/Placards/Labels/Decals (accurate/legible)			
Annual Inpsection (verify)			
Batteries/Battery Tray (opens/closes, latch/lock, terminals, cables, hold downs)			
Turret Turntable (gears/lock pin/stops)			
Accessory Plugs and Cables (operational)			
Coverpanels (open/close, latch/lock operational)			
Engine (fluids/filters/belts/hoses)			
Lights/Strobes/Backup Alarm (operational)			
Fuel (check fuel level & secure cap)			
Boom (general condition and wear, operation manuals present)			
Articulated Joints/Power Track (wear/cracks, lines/hoses)			
Waring Flag (inplace & in good condition)			
Platform (guardrails/toe boards/anchorages inplace & operational)			
Controls (clearly marked/hold to run)			

Start-Up Checks

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Engine (does it sound normal)			
Instruments (check for normal readings)			
Exhaust System (check for leaks & excessive smoke)			
Battery (charge levels)			
Horn & Backup Alarm (verify function)			
Boom (raise/lower/extend/retract)			
Turret (rotate)			
Drive/Steering/Platform (forward/reverse, left/right, tilt/rotate)			
Outrigers/Stabilizers/Extendable Axels			
Function Enabled (deadman) Devices			
Manual/Auxiliary Controls			
Safety Interlocks			
Other Start-Up Inspections			
Service Required			

Equipment Notes

FLEX-ERECT

Pre-Use Inspection for Aerial Scissor Lift

Project Name: _____ **Inspection Completed By:** _____

Flex-Erect Project Number: _____ **Inpsection Date:** _____

Workplace Inspection

Description	Acceptable?		
	Yes	No	N/A
Drop Offs or Holes			
Bumps & Floor/Groumd Obstructions			
Debris			
Overhead Obstructions			
Energized Overhead Power Lines			
Ground Layed Power Lines			
Hazardous Locations			
Ground Surface & Support Condiditons			
Pedestrian/Vehicle Traffic			
Wind and Weather Conditions			
Other Possible Hazards			
General Comments			
Equipment Make/Model			

Equipment Walk-Around Inspection (Visual)

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Wheels, Tires, & Axles (condition/inflation)			
Hydraulic Components/Boom Valley (leaks, levels, debris, cylinders, pins/locks)			
Data Plate/Placards/Labels/Decals (accurate/legible)			
Annual Inpsection (verify)			
Batteries/Battery Tray (opens/closes, latch/lock, terminals, cables, hold downs)			
Turret Turntable (gears/lock pin/stops)			
Accessory Plugs and Cables (operational)			
Coverpanels (open/close, latch/lock operational)			
Lights/Strobes/Backup Alarm (operational)			
Elevating Section/Top of Base (general condition/wear, leaks/debris)			
Articulated Joints/Power Track Pivot Pins (wear/cracks, lines/hoses, wear/secure)			
Waring Flag (inplace & in good condition)			
Platform (guardrails/toe boards/anchorages inplace & operational)			
Controls (clearly marked/hold to run)			
Other Visual Inspections			

Start-Up Checks

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Instruments (check for normal readings)			
Battery (charge levels)			
Horn & Backup Alarm (verify function)			
Platform (raise/lower/extend/retract)			
Pothole Protection			
Drive/Steering/Platform (forward/reverse, left/right)			
Outrigers/Stabilizers			
Function Enabled (deadman) Devices			
Manual/Auxiliary Controls			
Safety Interlocks			
Other Start-Up Inspections			
General Comments on Equipment			
Service Required			

Equipment Notes

FLEX-ERECT

Pre-Lift Plan Checklist

Project Name: _____ **Completed By:** _____

Flex-Erect Project Number: _____ **Date:** _____

Lifting Equipment Considerations

Description	Acceptable?		
	Yes	No	N/A
Are the lifts within the equipments rated capacities?			
Boom deflections considerations?			
Have all potential overhead obstructions been identified?			
Have environmental considerations addressed? (wind, weather, lightning, etc)			
Have electrical hazards been addressed? (Overhead and Underground)			
Clearance distances established?			
Is a spotter required?			
Work Area Properly Barricaded?			
Stagging area established?			
General Contractor notified of commencement of operations?			

Other Possible Hazards

General Comments

Equipment Walk-Around Inspection (Visual)

Description (Consult Machine Operator Manual for Specific Item Guidance)	Acceptable?		
	Yes	No	N/A
Walk-Around Inspection (warning decals, operators manual, capacity plate, etc.)			
Forks/Locking Pins, Carriage, Mast, Boom			
Wheels, Tires & Lub Nuts (Condition/Pressure)			
Engine (check oil level & visually inspect for leaks)			
Engine Belts (check for proper alignment & wear)			
Air Cleaner (present and clean, check service indicator)			
Radiator (check cold coolant level & visually inspect for leaks)			
Hydraulic Tank (check fluid level & visually check for leaks)			
Fuel (check fuel level and secure cap)			
Battery (check terminals, cables, and hold downs)			
Overhead Guard/ROPS (visually inspect for damage)			
Seatbelt (verify locking mechanism)			
Ignition (verify no tampering is present)			
Waring Flag (inplace & in good condition)			

Other Visual Inpsections

Rigging Considerations

Description	Acceptable?		
	Yes	No	N/A
All rigging has been inspected by a qualified rigger?			
Are shackles correctly sized for the load and sling eyes?			
Are sling softeners needed?			

Rigging Considerations

Roles, responsibilities, and qualifications for personnel have been identified?			
A pre-lift meeting has been conducted?			

Area Preperation

Locations for the load landings have been selected and prepared?			
Blocking and/or cribbing available to set loads on?			
Travel paths have been determined and are cordoned off?			
Other personnel in the area have been notified of the lifts?			
Have ground bearing support considerations been addressed?			

General Comments

Equipment Notes

FLEX-ERECT

SECTION 28

SUBJECT: Communicable Virus Program – COVID-19 Standard

GENERAL: The goal of Flex-Erect is to provide a workplace free of safety and health hazards for all of our employees. In order to achieve this goal, every employee MUST comply with all Company Safety Policies and Procedures. Failure to do so, by any employee at any time, is to compromise our Company's objectives and to possibly endanger the welfare of fellow employees or yourself.

It must be understood that this document is a living document and will be updated as the information provided from Government Agency's changes. We are monitoring the progress and effects of the virus; the protective and best practices for Essential Businesses. The major focus of this standard is the Mitigation of COVID-19 for employees working on job sites, working within six feet from other team members, and within close proximity to other trades. This standard is not to be construed to be the final authority on work practices or PPE standards. The sites we work on are controlled by Owners and/or General Contractors and their programs may provide more stringent guidelines. If this is the case, then the more stringent program will be the standard our employees follow during the course of our work.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect's owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect where there is danger of serious personal injury or risk of exposure to Covid-19 due to person to person transmission. Supervisors are required to ensure their employees are aware of the contents of this program and have received the basic awareness training before their assignment to work.

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5	Personnel Responsibility	3
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7	Social Distancing	4
8	Risk Assessment and Job Hazard Analysis (JHA)	4
9	Normal Work PPE	5
10	Close Contact Work PPE	5
11	CDC recommended sequence to put on PPE is as follows	5

Covid-19 PPE Standard

1. Standard Statement.

This standard is set forth for the specific purpose of addressing the Covid-19 Pandemic that now grips the United States. We would like to provide a specific guideline that can be followed to protect each employee for potential infection but, at this time, we cannot. We, however, are providing recommendations based on the latest direction from the US Centers for Disease Control (CDC), the US Department of Labor, Occupational Safety and Health Act (OSHA), Texas Health and Human Services, Harris County Health Department, and the City of Houston Health Department.

Departments and Documents used to coordinate this Standard:

1. CDC - https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html
2. OSHA - https://www.osha.gov/Publications/OSHA3990.pdf
3. Texas Health and Human Services - https://hhs.texas.gov/
4. Harris County Health Department - https://publichealth.harriscountytx.gov/
5. City of Houston Health Department - https://www.houstontx.gov/health/

Additionally, OSHA, the CDC nor any other Federal, state, or local regulatory agency has published COVID-19 PPE recommendations to accommodate situations where 6' distancing cannot be maintained. We will be using the recommendations and best practices as provided by our industry associations and partners and will be adopting minimum additional COVID-19 PPE standards for the situations where 6' distancing cannot be maintained while performing our work.

2. Engineering and Work Practice Controls

It is the intent of this program to establish controls that could help to prevent the transmission and infection of COVID-19. The controls will be established and shall remain in effect until such time that the Authority Having Jurisdiction has modified the COVID-19 risk assessment.

In general, the following shall be considered standard practice for all employees at all job sites, Company warehouse, and Company office:

2.1 Do not congregate in lunch areas.
2.2 Do not share tools.
2.3 Do not share personal protection equipment (PPE).
2.4 Sanitize reusable PPE per manufacturer's recommendation prior to each use.
2.5 Ensure used PPE is disposed of properly.
2.6 Utilize disposable gloves where appropriate; instruct workers to wash hands after removing gloves.
2.7 Disinfect reusable supplies and equipment.
2.8 Identify specific locations and practices for daily trash such as: paper, hand towels, food containers, etc. Instruct workers responsible for trash removal in proper PPE/hand washing practices.
2.9 Routinely clean high touch surfaces.
2.10 Do not use a common water cooler. Provide individual water bottles or instruct workers to bring their own.
2.11 Utilize disposable hand towels and no-touch trash receptacles.

3. Employee Training and Safe Work Practices

All employees will be provided training on the standards contained within this program, response to current and potential future outbreaks of COVID-19, current federal, state, and local restrictions and safe work practices.

3.1 Employee training shall be conducted in the following areas:

- 3.1.1 Site Entry procedures,
- 3.1.2 What to do if an employee is sick,
- 3.1.3 Social distancing standards,
- 3.1.4 How to wear, put on, and take off PPE,
- 3.1.5 How to dispose of PPE,
- 3.1.6 Cleaning and disinfecting of each team members PPE,
- 3.1.7 How to properly store reusable PPE,
- 3.1.8 When and what PPE is necessary, and
- 3.1.9 The limitations of PPE.

4. Job Site Entry Protocol

The following standards shall be implemented by all teams on all job sites, at the company warehouse and within the company office.

4.1 Each employee shall answer the self-assessment questions as follows:

- 4.1.1 Have you, or anyone in your family, been in contact with a person that has tested positive for COVID-19?
- 4.1.2 Have you, or anyone in your family, been in contact with a person that is in the process of being tested for COVID-19?
- 4.1.3 Have you, or anyone in your family traveled outside of the U.S. within the last two weeks?
- 4.1.4 Have you been medically directed to self-quarantine due to possible exposure to COVID-19?
- 4.1.5 Are you having trouble breathing or have you had flu-like symptoms within the past 48 hours, including: fever, cough, shortness of breath?

4.2 Each Project Superintendent and/or Foreman shall check the temperature of each team member prior to entering the project site.

- 4.2.1 The normal human temperature range should be between 97.7–99.5 °F

5. Personnel Responsibility

5.1 It is critical that employees NOT report to work while they are experiencing illness symptoms such as fever, cough, shortness of breath.

5.2 Employees should seek medical attention if they develop any symptoms.

5.3 Employees must sanitize and wash their hands

5.4 Individuals should seek medical attention if they develop these symptoms

5.5 All employees will comply with the Harris County “Use of Face Coverings Order”. This order requires that all persons over the age of ten (10) wear face coverings that cover the nose and mouth. These face coverings may be a homemade mask, scarf, bandana, handkerchief, or other cloth mask. If you need assistance acquiring a mask, please contact your supervisor.

5.6 Employees should seek medical attention if they develop these symptoms.

5.7 Employees must sanitize and wash their hands.

5.8 Sick employees are to stay home from work if any of the following conditions are met:
Sick employees must notify their direct supervisor if they are sick and not coming to work.

5.8.1 Employees who have symptoms of acute respiratory illness,

5.8.2 Have a fever of greater than 99.5° F using an oral thermometer,

5.8.3 Signs of a fever, and/or,

5.8.4 Any other symptoms for at least 24 hours, without the use of fever-reducing or other symptom-altering medicines (e.g. cough suppressants). Employees should notify their supervisor and stay home if they are sick.

6. Company Responsibility

6.1 In the event of an employee exposure Flex-Erect will facilitate Covid-19 testing for the employee. The test shall be administered by Next Level Urgent Care with result delivered within 24-48 hours. The cost of the testing shall be at the expense of Flex-Erect.

6.2 All new hire employees shall be tested as part of our on boarding process. Flex-Erect will facilitate Covid-19 testing for the potential new employee. The test shall be administered by Next Level Urgent Care with result delivered within 24-48 hours. The cost of the testing shall be at the expense of Flex-Erect. In the event of a Covid-19 Positive test, the individual will not become an employee Flex-Erect and will be given information to allow them to seek medical attention.

6.3 Sick Employees.

6.3.1 Separate sick employees. CDC recommends that employees who appear to have acute respiratory illness symptoms (i.e. cough, shortness of breath) upon arrival to work or become sick during the day should be separated from other employees and be sent home immediately.

6.4 Provide PPE and Sanitization means (masks and hand sanitizer).

6.5 The Company will follow the latest CDC Guidelines for “Return to Work”.

6.5.1 Direct or Indirect Exposure to Covid-19 Positive Individual

6.5.1.1 An employee had direct contact with a confirmed case of Covid-19 (within 6ft for longer than 15 minutes) within the last 14 days:

6.5.1.1.1 If the employee has and is asymptomatic then the employee shall quarantine for 3 days. Maintain safety protocols and temperature checks three times per day. If after 3 days no symptoms are exhibited then the employee may return to work with use of N95 face mask, temperature checks three times per day, and social distancing. In the event Covid-19 screening has been completed the employee may return to work after a Covid-19 negative result.

6.5.1.1.2 If the employee has and is symptomatic then refer to 6.5.4 and/or 6.5.5 below.

6.5.1.2 An employee had indirect contact with a confirmed case of Covid-19 (Secondary/Tertiary Exposure) within the last 14 days:

6.5.1.2.1 If the employee has and is asymptomatic then the employee shall return to work as long as they remain asymptomatic. Employee shall monitor their own symptoms as well as fully participate in Job Site Entry Protocol as described in previous sections. Maintain safety protocols including use of N95 face mask, temperature checks three times per day, and social distancing. In the event Covid-19 screening has been

completed Flex-Erect will use results to determine future work assignments.

6.5.1.2.2 If the employee has and is symptomatic then refer to 6.5.4 and/or 6.5.5 below.

6.5.2 Unconfirmed COVID-19 with illness

6.5.2.1 An employee who has had a fever and cough, but did not get confirmation they were infected with COVID-19. They have fully recovered from their illness with or without medical intervention. Based on the CDC guidelines, **you can allow them to return to work only under all of the following conditions:**

6.5.2.1.1 At least 3 days have passed since recovery, with no fever for a minimum of 72 hours. Employees must have no abnormal temperature for 72 hours ***without*** the use of any fever-reducing medicines (aspirin, acetaminophen, or ibuprofen)

6.5.2.1.2 Their respiratory symptoms have improved

6.5.2.1.3 7 days have passed since the beginning of any symptoms

6.5.3 Confirmed COVID-19 with *no* illness

6.5.3.1 An employee who has been confirmed (tested positive by a medical professional) with COVID-19 but has not become ill due to the virus? They have to remain in isolation following their diagnosis. Based on the CDC guidelines, **they should be able to return to work only under all of the following conditions:**

6.5.3.1.1 After at least 7 days have passed since the date of their first positive COVID-19 test

6.5.3.1.2 They have not become ill

6.5.3.1.3 For an additional 3 days ***after*** they end isolation, they continue to limit contact (stay 6 feet away) with others

6.5.3.1.4 They wear a mask or other covering of their nose and mouth to limit the potential of dispersal of respiratory secretions

6.5.4 Confirmed COVID-19 with illness not requiring hospitalization

6.5.4.1 This is an employee who has been confirmed (tested positive by a medical professional) with COVID-19 and has become mildly or moderately ill due to the virus. These employees were the ones who self-isolated and medicated at home and did not require hospitalization. Based on the CDC guidelines, they should be able to return to work only under all of the following conditions:

6.5.4.1.1 At least 3 days have passed since their recovery, with no abnormal fever for a minimum of 72 hours. Employees must have no significant temperature for 72 hours ***without*** the use of any fever-reducing medicines (aspirin, acetaminophen, or ibuprofen)

6.5.4.1.2 Respiratory symptoms have improved

6.5.4.1.3 No continuing illness: the employee exhibits no symptoms of COVID-19

6.5.4.1.4 The employee has had ***2 confirmed negative COVID-19 tests***, administered by a medical professional and spaced at least 24 hours apart

6.5.5 Confirmed COVID-19 with illness requiring hospitalization

6.5.5.1 An employee who has been confirmed (tested positive by a medical professional) with COVID-19 and has become ill due to the virus, requiring hospitalization may be at higher risk of shedding (dispersing respiratory secretions) and spreading the infection. The CDC recommends rigorous testing before returning these employees to work since they may experience longer periods of viral detection compared to those with mild or moderate symptoms.

7. Social Distancing

7.1 Do not host large group meetings. CDC recommends that we avoid gatherings of 10+ people.
7.2 6'-0" distance shall be maintained for job site labor and in any meetings.
7.3 When possible, meetings shall be held via conference or online until further notice.
7.4 Discourage personal contact i.e. handshakes.
7.5 Review Normal Contact and Close Contact work procedures and address work accordingly.

8. Risk Assessment and Job Hazard Analysis (JHA)

8.1 Should any employee who is unable or unwilling to work within this standard, then work requiring Covid-19 PPE shall not be performed and the supervisor shall immediately notify the Company so that the work can be re-evaluated.
8.2 All tasks and work shall first be reviewed, and all efforts made to maintain 6'-0" distance between employees.
8.3 All tasks will be completed **only after** a JHA has been completed with specific focus on social distancing requirements. The JHA shall document the controls put in place for each task.
8.4 The JHA shall determine whether Normal Work or Close Contact Work Standards shall apply to each task.

8.4.1 The JHA shall answer the following question:

8.4.2 Will the work as planned in the JHA allow 6'-0" distancing between each of our team members and between our teams and other trades?

8.4.2.1 If the answer is YES, then Normal Work PPE can be used to complete this specific task.

8.4.2.2 If the answer is NO, then Close Contact Work PPE will be used to complete this specific task.

9. Normal Work PPE

9.1 After completing the JHA as indicated above to determine that Normal Work PPE can be used to complete the specific task then the following is a minimum PPE standard:

9.1.1 A cotton face mask, surgical mask, or KN95 mask must be used in addition to all other required OSHA compliant PPE. The masks shall provide coverage of the nose and mouth and must be worn in place.

10. Close Contact Work PPE

10.1 After completing the JHA as indicated above to determine that Close Contact Work PPE must be used to complete the specific task then the following is a minimum PPE standard:

10.1.1 **A surgical mask and goggle/face shield combo must be used**, in addition to all other required OSHA compliant PPE. The masks shall provide coverage of the nose

and mouth and must be worn in place.

or

10.1.2 **A KN95 Mask with goggles must be used**, in addition to all other required OSHA compliant PPE. The masks shall provide coverage of the nose and mouth and must be worn in place.

and

10.1.3 Nitrile gloves under work gloves.

11. CDC recommended sequence to put on PPE is as follows:

11.1 Putting on a mask:

11.1.1 Place it over the nose, mouth and chin.

11.1.2 Fit the flexible nose piece over the bridge of the nose.

11.1.3 Secure it on the head with ties or elastic.

11.1.4 Adjust it to fit.

11.1.5 If the mask has two elastic head bands, these should be separated. With the mask over the nose, mouth and chin, stretch the bands over the head and secure them comfortably – one on the upper back of the head and one below the ears at the base of the neck.

11.2 Putting on goggles and face shield:

11.2.1 Position goggles over the eyes and secure to the head using the earpieces or headband.

11.2.2 Position the face shield over the face and secure it on the brow with the headband.

11.2.3 Adjust for comfort.

11.3 Putting on gloves:

11.3.1 Gloves are the last element of PPE to be applied.

11.3.2 Extend the hands into the gloves and extend the gloves to cover the wrist of the gown or Tyvek suit.

11.3.3 Tuck the cuffs of the gown securely under each glove. (If gown or Tyvek Suit are not being worn pull gloves to cover over wrist)

11.3.4 Adjust for comfort and dexterity.

11.4 Safe Work Practices

11.4.1 Keep gloved hands away from the face

11.4.2 Avoid touching or adjusting other PPE

11.4.3 Remove gloves if they become torn; perform hand hygiene before putting on new gloves

11.4.4 Limit surfaces and items touched

11.4.5 Change when torn or heavily contaminated

11.4.6 Perform hand hygiene

11.5 Cleaning requirements after PPE use:

11.5.1 These standards for cleaning must be followed every time a person must remove their PPE. For example, morning break, lunch, afternoon break, end of day, if PPE is removed for a cigarette break, or to use the restroom.

11.5.1.1 Remove and dispose of gloves per CDC guidelines. Do not touch outside of gloves.

11.5.1.2 Wash hands immediately with soap and water for at least 20 seconds.

11.5.1.3 Remove mask without touching outside or front. If it still maintains functionality, place in a paper bag for reuse and label who it belongs

to. That person should retain control of their mask. Used masks should never be shared with another person.

11.5.1.4 Wash hands immediately with soap and water for at least 20 seconds.

11.5.1.5 Remove hard hat and goggles or face shield by loosening straps. Do not touch the front of the goggles or face shield. Clean thoroughly with soap and water or alcohol-based wipe or viricidal type cleaning solution

11.5.1.6 Wash hands immediately with soap and water for at least 20 seconds.

11.5.1.7 Remove protective clothing without touching outside of the garment and turn garment inside out before disposal.

11.5.1.8 Wash hands immediately with soap and water for at least 20 seconds.

11.5.1.9 Discard all non-reusable PPE in a trash receptacle with a lid.

11.5.1.10 Wash hands immediately with soap and water for at least 20 seconds.

Should any employee have any questions regarding this section of the Flex-Erect Safety, Health & Environmental Program please contact our Safety consultant (CSC Safety), your direct supervisor, or any Company management team member.

FLEX-ERECT

SECTION 29

SUBJECT: Confined Space Entry Safety Program

REGULATORY STANDARD: OSHA - 29 CFR 1910.146, 1926.21(b)(6)(i)(ii)

GENERAL: This Program is intended to address the issues of evaluating potential confined space hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The Safety Manager is the program coordinator, acting as the representative of Flex-Erect owners, who have the ultimate responsibility for all facets of this program. The Safety Manager is the sole person authorized to amend these instructions. Flex-Erect has authorized the Safety Manager and any Supervisor or Employee to halt any operation of Flex-Erect here there is danger of serious personal injury. Supervisors are required to ensure their employees are aware of the contents of this program and have received the confined space entry or awareness training before working in any areas where confined spaces exist.

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CONFINED SPACE ENTRY SAFETY PROGRAM

1. Written Program.

Flex-Erect will review and evaluate this program annually and when changes occur to 29 CFR 1910.146 or 1926, that prompt revision of this document, or when operational changes occur that require a revision of this document.

2. Specific Responsibilities:

2.1 Project Manager. The Project Manager will be responsible for ensuring that all employees performing confined space entry are trained an authorized to do the work.

2.2 Supervisors. Supervisors are responsible for identifying any confined spaces or potential confined spaces before assignment of employees to any work. Supervisors will notify the Safety Manager immediately if there is any doubt as to the designation of a work area as a confined space.

2.3 Entry Supervisors are responsible for all personnel who enter or work in confined spaces. In addition, they will do the following:

2.3.1 Have knowledge of Hazards/Exposure Conditions: The entry supervisor will know and understand the unique hazards and exposure conditions associated with each confined space, and be aware of the effects of the exposure conditions.

2.3.2 Establish site specific safety procedures to coordinate operations with other contractors working in the same confined space.

2.3.3 Confined Space Entry Permit: The entry supervisor will ensure that the Confined Space Entry Permit is completed and must sign it before anyone enters a confined space.

2.3.4 Authority Assigned: Entry supervisor can authorize entry into designated confined spaces. The entry supervisor can also deny entry, terminate entry, remove unauthorized personnel, and cancel the permit at any point during the procedure.

2.3.5 Lock-out/Tag-out before anyone enters a confined space Lock-out/Tag-out procedure must be performed in accordance with the Flex-Erect Lock-out/Tag-out Program to ensure equipment is properly isolated.

2.3.6 Pre-entry Conditions: The entry supervisor will ensure that the pre-entry conditions are acceptable, and that conditions do not deteriorate during the entry. The entry supervisor will perform pre-entry review activities for confined spaces and discuss with entrants the potential hazards, the appropriate safeguards, and the personal protective equipment required.

2.3.7 Rescue Services Coordination/Notification: The entry supervisor will ensure that rescue services have been coordinated and notified of the pending entry.

2.3.8 Rescue Alarm and Communication System: The entry supervisor will functionally test the rescue alarm and communication system, verifying normal operation.

2.3.9 Maximum Residence Time: Based on work being performed, determine the maximum residence time for personnel in the confined space. The maximum continuous residence time should not exceed two hours per entrant.

2.3.10 Training Verification: Verify that each person who participates in any confined space entry has been trained.

2.3.11 Responsibility Transfer During Entry/Shift Change: When a transfer of responsibility occurs during an entry, the new entry supervisor will verify the entry conditions and initial the entry permit. During a shift change, the new entry supervisor will complete a new permit.

2.3.12 Emergency Medical Information: The entry supervisor will have access to material safety data sheets (MSDS) or equivalent information for use by all confined-space entry personnel, and will furnish the information to medical facilities that treat any exposed or injured member of the entry team.

2.3.13 Stationing Attendants: The entry supervisor will station an attendant at each permit-required confined space and ensure that an attendant serves for the duration of the permit.

2.4 Attendant(s) is responsible to do the following:

2.4.1 Knowledge of Hazards/Exposure Conditions: Attendants will read and sign the entry permit, state their understanding of the unique hazards and exposure conditions in the confined space to the entry supervisor, and be aware of the effects of the exposure conditions.

2.4.2 Entry Conditions/Permit: The attendant will participate in the process of verifying entry conditions, and will sign the permit.

2.4.3 Service & Duty: An attendant will serve for the duration of the permit. The attendant will remain at his/her post and not leave for any reason, except self-preservation, unless replaced by an equally qualified individual while entry continues. A designated attendant will be provided for each confined space our personnel are working in. A single attendant monitoring multiple confined space entries is prohibited.

2.4.4 Continuous Communication: The attendant will maintain continuous communication with all entrants by voice, radio, telephone, visual observation, or any other equally effective means.

2.4.5 Monitoring Conditions. The attendant will:

2.4.5.1 Monitor conditions inside and outside of the confined space and determine whether or not it is safe for the entrants to remain in the confined space. Entrants or their representatives have the right to participate in and review calibrated air monitoring data before entry.

2.4.5.2 Perform field-testing of equipment before each use in accordance with the manufacturer's recommendations for that equipment to

ensure that it functions properly.

2.4.5.3 Perform the tests indicated on the confined-space entry permit, including any additional tests that may be necessary. Record the results on the confined-space entry permit.

2.4.5.4 Ensure that the confined-space monitoring procedures test for atmospheric contaminants are representative of all areas of confined spaces.

2.4.6 Authority: The attendant will have the authority to order entrants to exit the space, and perform a non-entry retrieval at the first indication of an increased exposure condition, an unexpected hazard/exposure condition, equipment malfunction, any unusual conduct by the entrants which could indicate a toxic reaction, or a situation occurring outside the confined space that could pose a hazard to the entrants.

2.4.7 Procedure for Emergency Assistance: The attendant will know the procedure and have the means to summon immediate emergency assistance.

2.4.8 Unauthorized Personnel: The attendant will keep all personnel not listed on the permit out of the area designated for confined space entry.

2.4.9 Lock-out/Tag-out: Before anyone enters a confined space Lock-out/Tag-out procedures must be performed in accordance with the Flex-Erect Lock-out/Tag-out Program to ensure equipment is properly isolated.

2.5 Entrant. Individuals who work in confined spaces shall do the following before entering:

2.5.1 Have knowledge of Hazards/Exposure Conditions: Entrants will read and sign the entry permit, state their understanding of the unique hazards and exposure conditions in the confined space to the entry supervisor, and be aware of the effects of the exposure conditions.

2.5.2 Continuous Communication: The entrant will maintain continuous communication with the attendant at the point of entry by voice, radio, telephone, visual observation, or any other equally effective means.

2.5.3 Use of Equipment: Entrants will know how to properly use all necessary entry and personal protective equipment.

2.5.4 Emergency Exits: Entrants will exit the confined space immediately when the attendant or entry supervisor orders an evacuation, or they perceive warning signs or symptoms due to exposure.

2.5.5 Lockout/Tagout: Before anyone enters a confined space Lockout/Tagout procedures must be performed in accordance with Flex-Erect Lockout/Tagout Program to ensure equipment is properly isolated.

2.6 Emergency Rescue Services.

2.6.1 Flex-Erect will provide rescue service throughout the duration of the entry as required. Non –Entry Rescue is the preferred method of rescue. A rescue service

must be on-site for immediately dangerous to life and health (IDLH) conditions while work is being performed. The rescue service will be capable of performing appropriate rescue measures. The designated Attendant or Entry Supervisor will be responsible to notify the rescue service in the event that rescue or non-entry retrieval is being performed.

2.6.2 Response Time: A four-minute time limit on retrieving an entrant incapacitated by oxygen deficiency should be the goal of any rescue plan.

2.6.3 First Objective: The first objective of the rescue team is non-entry rescue (retrieval) and assistance. If this is not feasible the attendant will notify the rescue service team.

2.6.4 Lock-out/Tag-out: Before anyone enters a confined space Lock-out/Tag-out procedures must be performed in accordance with the Flex-Erect Lock-out/Tag-out Program to ensure equipment is properly isolated.

3. Training Requirements:

3.1 Awareness Training:

3.1.1 All Flex-Erect employees will receive awareness training that will cover what a confined space is, what the hazards of confined spaces are, and identification of all confined spaces.

3.2 Entry Training

3.2.1 Entry training will be provided to Entry Supervisors, Authorized Attendants, and Authorized Entrants to ensure that they acquire the knowledge and skills necessary for safe entry into confined spaces.

3.2.2 Entry training will be provided before an employee is required to perform work in a confined space, before there is a change in assigned duties, whenever there is a change in permit space operations that presents a hazard to which employees have not previously been trained, and whenever there are deviations or inadequacies in permit space entry procedures.

3.2.3 All entry teams will be trained in confined space entry according to this document.

3.3 Type and Frequency of Training:

3.3.1 Classroom: All entry teams will receive academic training periodically.

3.3.2 Entry Drill: All entry teams will receive entry procedure drill training periodically.

3.4 Training Requirements:

3.4.1 Entry Permit: All entry teams will be taught how to complete the entry permit.

3.4.1.1 This training will include establishing a system for preparation, issuance, use, and cancellation of an entry permit.

3.4.2 Hazard/Exposure Condition Requirements:

3.4.2.1 Atmospheric: All entry teams will be taught that even though human senses may be unable to detect an exposure conditions, breathing the atmosphere could be fatal. Only proper testing can be relied on to determine that the atmosphere is breathable. Warning characteristics of exposure such as odor, taste, feel, and symptoms caused by exposure, some of which may show up as long as 72 hours after exposure will be covered.

3.4.2.2 Lock-out/Tag-out: All entry teams will be trained in lock-out/tag-out procedures according to the Flex-Erect Lock-out/Tag-out Program.

3.4.3 Improper Entrance: Attendants will receive training concerning the importance of not entering a confined space unless they are properly equipped and relieved of their duties by another qualified attendant. Attendants who make improper entries into confined spaces will very likely fall victim to the associated hazards.

3.4.4 Ventilation: All entry teams will be trained to ensure that the confined space has been adequately purged prior to entry, and that adequate ventilation is maintained.

3.4.5 Atmospheric Testing: Pre-entry testing of confined space atmospheres will be explained and demonstrated to all entry teams. Testing assures that adequate environmental controls are in place before entry.

3.4.6 Oxygen Enriched Environment: All entry teams will be trained in the hazards associated with working in an oxygen-enriched environment. Enriched oxygen levels present serious safety hazards because an entrant's clothing and hair may become extremely flammable due to excess oxygen, and absorbed oxygen desorbs slowly.

3.4.7 Respiratory Protective Equipment: All entry teams will be trained and certified in the use of respiratory protective equipment in accordance with 29 CFR 1910.134.

3.4.8 Personal Protective Equipment: All entry teams will be trained in the proper use of all applicable personal protective equipment (PPE) for eyes, face, head, body, and extremity protection. Training will include recognition of signs of equipment failure.

3.4.9 Physical Protective Equipment: All entry teams will be trained in the proper use of harnesses, hoists, fall arrestors, ropes, and rigging necessary to safely enter confined spaces.

3.4.10 Communication Equipment: All entry teams will be trained in the proper use of the communications equipment for people in a confined space, and communications equipment for summoning external emergency services.

3.4.11 Evacuation of a Confined Space: All entry teams will be taught the importance of immediate evacuation to a non-hazardous atmosphere to prevent serious or

permanent injury. In order to minimize or prevent injury to themselves, they will leave the confined space/area for a safe atmosphere immediately on being ordered to do so, or when they recognize any sign of reaction to an exposure condition. Training seminars should address hazards inside and outside the confined space.

3.5 Documentation: The successful completion of training for all confined space entry personnel will be retained and made available for inspection 3 years, minimum.

4. Hazards Most Common to Confined Spaces.

4.1 Hazardous Atmosphere:

4.1.1 Oxygen-deficient: Normal air contains approximately 20.9% oxygen; oxygen levels should remain between 19.5% and 23.5% within confined spaces. An atmosphere is defined as oxygen deficient if it contains less than 19.5% oxygen. The oxygen level in a confined space can decrease because of work being done, such as welding, cutting, or brazing or it can be decreased by certain chemical reactions. Total displacement of oxygen by another gas, such as carbon dioxide, will result in unconsciousness, followed by death.

- Atmospheric tests must be performed in the following order: oxygen deficiency, flammability, and toxicity.

4.1.2 Oxygen-enriched: Enriched oxygen atmospheres are defined as containing greater than 23.5% oxygen. These atmospheres may cause flammable materials, such as clothing to burn violently when ignited.

4.1.3 Flammable vapors and airborne combustible dust: An atmosphere which contains flammable gases, vapors, or mists in excess of 10% of their lower flammable limit (LFL) or airborne combustible dust which meets or exceeds its LFL has a greater potential for fire or explosion.

4.1.4 Toxic gases and vapors: Serious injury or death may result when the atmosphere contains even low concentrations of toxic gases (e.g., hydrogen sulfide, sulfur dioxide, or nitrogen dioxide).

4.1.5 Other: Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

4.2 Electrical/Mechanical Hazards:

4.2.1 Injury can occur from the moving parts of equipment that is inadvertently activated or from electrical shock from energized circuits.

4.3 Physical Hazards

4.3.1 Injury can occur from physical hazards such as engulfment, falling objects, heat/cold stress, noise, and physical limitations of the employee, slipping, or falling.

5. General Controls for Confined Space Entry.

5.1 Pre-Planning:

5.1.1 Entry will not be permitted into a confined space until all precautions noted on the permit have been taken. All spaces will be considered permit spaces until the pre-entry procedures demonstrate otherwise. Entry supervisors (i.e., the person who signs the permit and authorizes entry into a confined space) will brief entrants, supervisors, and team members on their responsibilities and the hazards and controls for safe entry.

5.1.2 Every effort will be made to avoid the need to enter a confined space. If possible, confined spaces will be cleaned and ventilated before entry.

5.1.3 Effective Measures will be implemented to protect our personnel from internal and external hazards associated with the confined space entry. The external hazards will include, but not be limited to pedestrians, motor vehicles and heavy equipment operation in the work area

5.2 Non-Permit Required Confined Spaces (Non-Permit Spaces). The following activities will be performed in order to ensure safe entry into non-permit spaces:

5.2.1 Where appropriate barricades will be utilized to ensure that inadvertent entry into a confined space occurs.

5.2.2 Electrical equipment (e.g., ground fault circuit interrupters (GFCI) on power hand tools and other electrical equipment) will be properly grounded and bonded.

5.2.3 In general, proposed activities must not introduce hazards to the area thereby converting it into a permit required confined space.

5.2.4 If unexpected hazards arise, all employees within a confined space must immediately exit the space. Re-entry will not occur until a re-evaluation of the space is made to determine if it must be re-classified as a permit required confined space.

5.3 Permit Required Confined Spaces (Permit Spaces). In addition to the requirements for non-permit spaces, the following requirements are applicable to permit spaces:

5.3.1 All equipment at the confined space site will be set up and ready for entry before the issuance of the entry permit and actual entry.

5.3.2 A written permit will be completed and all applicable items annotated, marked, and checked. The Entry supervisor is responsible for ensuring that all items have been completed and signed.

5.3.3 Mechanical ventilation for actual or potential atmospheric hazards will be available or initiated where applicable.

5.3.4 Tests of the atmosphere before and during entry into a confined space will be

performed by a trained person. Continuous air testing will be conducted when ventilation is provided. Employees have the right to request additional air monitoring at any time.

5.3.5 An attendant(s) will be stationed at the entry point of the confined space and two-way communication with entrants in confined spaces will be utilized.

5.3.6 A rescue service will be readily available throughout the duration of the entry that is capable on entering the confined space. The rescue service shall be provided by either the host facility or an outside service. Non-entry rescue shall be conducted by our personnel.

5.3.7 The proper personal protective equipment (PPE), as deemed necessary will be worn. The Entry Supervisor will ensure that PPE is appropriate and compatible with the permit space environment.

5.3.8 A harness retrieval system, unless it increases the risk of entry or will not contribute to rescue, will be utilized to assist with non-entry retrieval.

5.4 Controlling Ignition Sources:

5.4.1 All ignition sources are prohibited in confined spaces. Where operations such as welding or cutting equipment are required, a hot work permit must be obtained. When open flames must be used in confined spaces, additional precautions will be taken to ensure adequate ventilation. Where electrical hot work must be performed, it must be done in accordance with the Flex-Erect Electrical Safety (Hot Work) Program.

5.4.2 Isolating the Area:

5.4.2.1 Isolation is the process whereby a permit required confined space is removed from service and protected from the release of energy and material into that space.

5.4.2.2 Before anyone enters a confined space lock-out/tag-out procedures must be performed in accordance with the Flex-Erect Lock-out/Tag-out Program to ensure equipment is properly isolated.

5.5 Purging and Ventilating Confined Spaces

5.5.1 Where a confined space contains sludge or other residue, tests positive for combustible or toxic elements, or indicates an oxygen deficiency or enrichment, the space must be purged with fresh air. In addition, positive ventilation will be provided both before and throughout entry into the space.

5.5.2 Residue will be removed using proper flushing techniques. Where appropriate, the space will be flushed with water or steam to ensure proper cleaning. All personnel must wear suitable PPE.

5.5.3 A continuous supply of fresh air (oxygen levels between 19.5% and 23.5%) will be provided in the work area before and while personnel are working in the confined space. Care must be taken to place the inlet upwind and away from

the confined space and any other potential contaminant (e.g., vehicle exhaust).

5.5.4 The atmosphere must be re-tested for any hazard(s) in question upon completing the purging and ventilating procedures.

5.5.5 Subsequent tests will be continuously performed for oxygen deficiency, flammability, and/or toxicity during entry into the confined space or at intervals frequent enough to ensure a safe atmosphere.

5.6 Testing and Monitoring the Work Environment:

5.6.1 Tests for oxygen deficiency or enrichment, flammability, and toxicity must be conducted by a trained individual. These tests must be performed before entry, continuously during entry, or at intervals frequent enough to ensure a safe atmosphere.

5.6.2 Atmospheric tests must be performed in the following order: oxygen deficiency, flammability, and toxicity. Some flammability test instruments require an adequate amount of oxygen to work properly. Use of sampling lines or containers is required to avoid exposure to personnel during the initial testing operations. It is also important to ensure that sampling is representative of the total atmosphere in the space (e.g., sample at different levels within a deep tank).

5.6.3 Oxygen concentration must be maintained between 19.5 and 23.5 percent.

5.6.4 If a confined space is vacated for more than one hour before the job is completed, the air shall be re-tested to ensure that conditions have not changed since the original entry.

5.7 Completing Entry Permits

5.7.1 A confined Space-Entry Permit is required before entering a high-hazard confined space. A trained and authorized Entry Supervisor will complete the permit.

5.7.2 Once the Entry Supervisor has signed the permit, it should be posted in an easily visible location. The entry supervisor's signature on the permit is verification that the space is safe to enter. The Entry Supervisor must ensure that all appropriate information is provided on the permit, tests specified on the permit are conducted, and that all procedures and equipment specified on the permit are in place to permit safe entry into the confined space. In addition, the Entry supervisor must ensure that the third party rescue service team is readily available throughout the duration of the entry.

5.7.3 The Entry supervisor terminates permits upon completion of work, if conditions change, or at the end of one work shift. Entry permits will only be used for the duration of one work shift unless otherwise noted on the permit. Permits will be retained in the site’s Safety Coordinator’s office and by the Safety Manger.

5.7.4 Upon the termination of a confined space permit, the Entry supervisor will contact the Safety Manager to conduct a debriefing. The Entry supervisor will provide information on hazards encountered during the entry and hazards

created by the work in the confined space.

6. Entry and Rescue Equipment.

6.1 Electrical: Ground-fault circuit interrupters will be used in the power supplies of portable electric equipment and with any portable tools and extension cords.

6.2 Personal Protective Equipment: Personal protective equipment for predicted exposures will be issued. Examples of such equipment are: rubber gloves, face masks, goggles, and ear plugs.

6.3 Respiratory Protection:

6.3.1 All respirators will be NIOSH approved. Respiratory protection will be worn in accordance with the Flex-Erect Respiratory Protection Program. Potentially acceptable Types include:

6.3.1.1 Dust and Mist Respirators

6.3.1.2 Supplied-Air Respirators: All supplied-air respirators will be either positive-pressure or continuous-flow types attached by hose to Grade D, certified breathing air cylinders. An escape pack, with a cylinder of breathing air, will also be worn with supplied- air respirators. The cylinder will contain a 5-minute supply of Grade D breathing air, minimum.

6.3.1.3 Self-Contained Breathing Apparatus (SCBA): SCBAs will have cylinders containing Grade D breathing air with a rated capacity of 30 minutes, minimum.

6.4 Ventilation: Ventilation will be provided by using a high-speed fan or blower to supply fresh air to a confined space. The volumetric flow rate and pressure will be specified to meet or exceed the maximum calculated requirements for air exchange in the confined space. (Section 5.6) Continuous air monitoring will be conducted when ventilation is applied.

6.5 Air Sampling:

6.5.1 Oxygen/LEL Percent Analyzer: A portable, continuous-monitoring, oxygen and flammable-vapor analyzer is required. It will be intrinsically safe and equipped with an audible alarm set at oxygen parameters at 19.5 – 23.5% and 10% LEL. Atmospheric tests must be performed in the following order: oxygen deficiency, flammability, and toxicity. Readings from fixed %LEL indicators or measuring devices are not acceptable for confined space entry. (See Section 5)

6.5.2 Direct Reading Toxic Gas Vapor Analyzer: A portable toxic gas/vapor analyzer such as a detector-tube instrument will be used when required.

6.6 Physical Protective Equipment:

6.6.1 Such equipment includes: mechanical devices for lowering and raising the entrant, mounting devices, anchor points, full body harnesses and retrieval lines, and communication systems and alarms.

6.6.2 Mechanical Device for Lowering and Raising the Entrant: Such a device, a rope/pulley system for example, will be designed to prevent free fall by using a ratchet, or equivalent device, and a brake. The retrieval line must remain taut to keep the entrant from falling while being lowered into the confined space.

- Note: Flex-Erect will provide factory-terminated ropes and rigging for normal entries.

6.6.3 Mounting Device or Anchor Point: A mounting device or anchor point can be a tripod, wall-mounted bracket, or an existing overhead beam to which the retrieval line can be attached. All installations will be mounted, or be positioned, outside the confined space so the attendant can retrieve the worker without entering the space. Equipment-Lifting and personnel-lifting apparatus will not be fastened to the same mounting device or anchor point.

6.6.4 Full Body Harness and Retrieval Lines:

6.6.4.1 Entrants will wear a full body harness for vertical entries over five feet. A full body harness is required; safety belts are not acceptable. The harness rings for attachment to the retrieval line should be located for maximum safety and comfort of the entrant.

6.6.4.2 Wristlets will be used for horizontal entries into confined spaces and may be considered in lieu of the body harness where the size of the confined space opening does not allow for a harness.

6.6.4.3 Retrieval lines, used for lowering or raising the entrant, will be attached to an anchor point outside the permit space in such a manner that retrieval can begin as soon as the attendant becomes aware of any problem.

6.6.5 Communication System Communication systems between the attendant and the entrant are of primary consideration. Line of sight between the attendant and the entrant will be maintained at all times when portable communication devices are not utilized. A two-way radio and/or telephone must be immediately available to the attendant for emergency situations. The attendant will not leave the point of entry to go for assistance unless relieved by another qualified attendant. The attendant will not in any case, enter the confined space.

6.6.6 Alarm: The alarm may be a portable gas operated horn, a battery operated alarm, or other device capable of immediately summoning the onsite third-party rescue team.

7. Definitions.

% LFL *(Percent Lower Flammable Limit):* The ratio of the vapor concentration relative to the LFL concentration for a specific solvent or gas. See "Lower Flammable Limit"

Acceptable entry conditions: The conditions that must exist in a permit space to allow entry and ensure that employees involved with a high-hazard confined space entry can safely enter into and work within the space.

Air, Breathing: Air that is free of contaminants and conforms to ANSI Type 1, Grade D (A-1151)
Atmosphere, acutely toxic: An atmospheric concentration of any substance which may result in employee exposure in excess of an OSHA Permissible Exposure Limit (PEL) or other exposure limit such as a Threshold Limit Value (TLV) which is capable of causing death, incapacitation, impairment of ability to self rescue, injury or acute illness. Refer to material safety data sheets (MSDSs) for specific chemical.

Atmosphere, chronically toxic*:* An atmospheric concentration of any substance which may result in employee exposure above the PEL or TL V which would cause injury or illness upon repeated or prolonged exposure. Refer to the MSDS or contact Industrial Hygiene.

Atmosphere, inert*:* An inert atmosphere exists when the atmosphere of a confined space is non-combustible, non-explosive and chemically non-reactive because of a deficiency of oxygen; it will not support life.
Attendant: An individual stationed outside one or more permit spaces to monitor authorized entrants. He/she performs all attendants' duties assigned in the employer's permit space program.

Authorized Entrant*:* An employee authorized by the employer to enter a permit space.

Blanking or Blinding: The absolute closure of a pipe, line, or duct by fastening a solid plate (e.g., A spectacle blind or skillet blind) that completely covers the bore and is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined Space*:*

1. Is a space large enough and so configured that an employee can bodily enter and perform assigned work?
2. Has limited or restricted means for entry or exit (e.g., Tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
3. Is not designed for continuous employee occupancy.

Below are examples of confined spaces that may exist:

1. Storm drain pipes
2. Sewers
3. Vaults
4. Storage tank
5. Utility pipelines
6. Manholes
7. Large vacuum vessels
8. Transformer tanks

Confined Space Program (permit required confined space program): The overall program for controlling and, where appropriate, protecting employees from permit space hazards and for regulating employee entry into permit spaces.

Double block and bleed: The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Egress, limited*:* Any configuration, which makes it difficult for an entrant to exit quickly, such as hatch location (ceiling, floor, wall), which requires ladders and hoists, interior construction (low overhead, crawl spaces, ductwork, closure devices which may be difficult to use), changing conditions (web paths or threadups, scrap buildup, open or closed doors).

Emergency: Any occurrence (including any failure of hazard control or monitoring of equipment) or internal or external event to the permit space that could endanger entrants.

Engulfment: The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: The action by which a person passes through an opening into a high-hazard confined space. Entry includes conducting work activities in that space, and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit*:* The written or printed document that is provided by the employer to allow and control entry into a permit space.

Entry Supervisor*:* The person (e.g., The employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present in a permit space where entry is planned, authorizing entry and overseeing entry operations, terminating entry. The duties of the entry supervisor may be passed from one individual to another during an entry operation if proper communication proper communication is observed.

Hazard: A possible hazard source of danger with the potential for personal injury.

Hazardous Atmosphere*:* An atmosphere that may expose employees to the risk of death, incapacitation, impairment of the ability to self-rescue (i.e., Escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist exceeding 10% of its lower flammable limit (LFL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL.
  NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 ft or less.
- Atmospheric oxygen concentration below 19.5% or above 23.5%. Atmospheric concentration of any substance for which a dose or permissible exposures limit is published in a DOE-mandated health and safety standard.

NOTE: An atmospheric concentration of any substance that is noticeable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- Any other atmospheric condition that is immediately dangerous to life or health. Other sources of information (e.g., Material safety data sheets that comply with the Hazard Communication Standard, 29 CFR 1910.1200, published information, and internal documents,) can provide guidance on establishing acceptable atmospheric conditions for air contaminants that OSHA has not yet determined a dose or the permissible exposure limit.

Permit-Required Confined Space*:* A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section.
- Contains any other recognized serious safety or health hazard.

Burn Permit: The employer's written authorization to perform operations capable of providing a source of ignition (e.g., riveting, welding, cutting, burning, and heating).

Immediately Dangerous to Life or Health*:* Any condition that poses an immediate or delayed threat to life, or that would cause irreversible adverse health effects, or that would interfere with an individual's ability to escape unaided from a permit space.
NOTE: Some materials (e.g., Hydrogen fluoride gas and cadmium vapor) may produce immediate transient effects that, even if severe, may pass without medical attention but are followed by sudden, possibly fatal, collapse 12-72 hours after exposure. The victim "feels normal "from recovery from transient effects until he/she collapses. Such materials in hazardous quantities are considered "immediately" dangerous to life or health.

Inerting*:* Displacement of the atmosphere in a permit space by a noncombustible gas (e.g., Nitrogen) to such an extent that the resulting atmosphere is noncombustible.
NOTE: This procedure produces an oxygen-deficient atmosphere that is immediately dangerous to life or health.

Isolation: The process by which a permit space is removed from service and completely protected against the release of energy and material into that space by means such as

1. Blanking or blinding.
2. Misaligning or removing sections of lines, pipes, or duct.
3. Using a double-block-and-bleed system.
4. Locking or tagging out all sources of energy.
5. Blocking or disconnecting all mechanical linkages.

Liquid, Flammable*:* A Class I liquid, which is a liquid having a flash point below 100oF (37.8°C) and having a vapor pressure not exceeding 40 psi at 100°F. Class I liquids are subdivided into three classes: Class IA, Class IB, and Class IC. See NFPA 30.

***Non-Permit Required Confined Space**:* A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

***Oxygen-Deficient Atmosphere**:* An atmosphere containing less than 19.5% oxygen by volume. Lower Flammable Limit (LFL) -For combustible liquids, LFL is the minimum concentration of vapor in air, which will propagate a flame if ignited. Each flammable or combustible liquid has a range of concentration of its vapor in air within which it will burn or explode. Concentrations below the LFL are too lean to burn or explode, and those above the upper flammable limit (UFL) are too rich to burn or explode. Expressed in percentage by volume of vapor in air, the point at which a fire or explosion potential begins to exist is 100%LFL. See "%LFL." Also referred to as Lower Explosive Limit (LEL) or Upper Explosive Limit (UEL).

***Maximum Residence Time**:* Maximum amount of time an entry team is allowed to work within the confined space.

***NIOSH**:* The National Institute for Occupational Safety and Health (NIOSH) was formed in 1971 to conduct research, develop educational and training resources, and develop criteria for recommended standards in the area of occupational safety and health. NIOSH is part of the Centers for Disease Control (CDC), and the Public Health Service under the Department of Health and Human Services in the executive branch of the U.S. Federal Government.

***Oxygen-Enriched Atmosphere**:* An atmosphere containing more than 23.5% oxygen by volume.

***PEL (Permissible Exposure Level)**, OSHA:* Legal exposure limits established in U.S. Government regulations.

***Rescue Service**:* Personnel designated to enter confined spaces to rescue employees from permit spaces.

***Retrieval System**:* The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

8. Forms

#	Form Name	Page #
1	**Confined Space Entry Permit**	**17**

Confined Space Entry Permit
ALL COPIES OF PERMITS WILL REMAIN ON SITE UNTIL THE JOB IS COMPLETE.

Site Description
Site Name:_____ Address:_____
Site Supervisor: _____Contact #: _____

Purpose of Entry:

Describe the Confined Space to be Entered:

Scheduled Start Date:	Scheduled Completion Date:
Scheduled Start Time:	Scheduled Finish Time:

Confined Space Entry Personnel	
Entry Supervisor	
Name	**Contact**
1.	
2.	

Authorized Attendant	
Name	**Contact**
1.	
2.	

Authorized Entrant	
Name	**Contact**
1.	
2.	
3.	
4.	

Emergency Response	
Name	**Contact**
Fire Department	
Ambulance	
Rescue	

Types of Hazards

Specific Hazards

{Check those items below which are applicable to your confined space permit.}

- ❑ Oxygen-Deficient Atmosphere
- ❑ Oxygen-Enriched Atmosphere
- ❑ Welding/Cutting
- ❑ Engulfment
- ❑ Toxic Atmosphere
- ❑ Flammable Atmosphere
- ❑ Energized Electrical Equipment
- ❑ Entrapment
- ❑ Hazardous Chemical

Note: If welding/cutting operations (hot work) are to be performed, complete the Hot Work Permit.

Safety Precautions

{Check those items below which are applicable to your confined space permit.}

- ❑ Self-Contained Breathing Apparatus
- ❑ Air-Line Respirator
- ❑ Fire-Retardant Clothing
- ❑ Ventilation
- ❑ Protective Gloves
- ❑ Lifelines
- ❑ Respirators
- ❑ Lockout/Tagout
- ❑ Fire Extinguishers
- ❑ Barricade Job Area
- ❑ Signs Posted
- ❑ Clearances Secured
- ❑ Lighting
- ❑ Ground Fault Interrupter
- ❑ Remarks_____

_____

Atmospheric Testing

PEL	Atmosphere	Results	Date	Results	Date	Results	Date	Results	Date
-19.5% to+23.5%	**Oxygen**	**%**		**%**		**%**		**%**	
Any % over 10%	**Lower Explosive Limit**	**%**		**%**		**%**		**%**	
10 ppm	**Hydrogen Sulfide**	**ppm**		**ppm**		**ppm**		**ppm**	
50 ppm	**Carbon Monoxide**	**ppm**		**ppm**		**ppm**		**ppm**	
5 ppm	**Sulfur Dioxide**	**ppm**		**ppm**		**ppm**		**ppm**	

Atmospheric Testing

PEL	Atmosphere	Results	Date	Results	Date	Results	Date	Results	Date
-19.5% to+23.5%	**Oxygen**	**%**		**%**		**%**		**%**	
Any % over 10%	**Lower Explosive Limit**	**%**		**%**		**%**		**%**	
10 ppm	**Hydrogen Sulfide**	**ppm**		**ppm**		**ppm**		**ppm**	
50 ppm	**Carbon Monoxide**	**ppm**		**ppm**		**ppm**		**ppm**	
5 ppm	**Sulfur Dioxide**	**ppm**		**ppm**		**ppm**		**ppm**	

Name of the person conducting the air testing:

Note: Continuous/ periodic tests shall be established before beginning the job.

Any questions pertaining to the test requirements shall be directed to the Entry Supervisor.

Testing Instrument Used			
Name	**Type**	**Identification**	**Calibration Date**

Name of the person conducting the atmosphere testing:

Additional Notes

Review & Completion

The permit has been reviewed with all personnel involved with the Confined Space Entry. All personnel shall sign below upon completion of review of the confined space entry permit.

Print	Sign	Date
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Permit Authorization

I certify that all actions and conditions necessary for safe entry have been performed.

✍ **SIGNATURE**: _____ **DATE:** _____

IN CASE OF EMERGENCY CALL 911