

# SAFETY DATA SHEET



## Pecora 1215 Seam Sealer

### 1. PRODUCT IDENTIFICATION

#### IDENTIFICATION of the SUBSTANCE or PREPARATION

<u>TRADE NAME (AS LABELED):</u>	<b>Pecora 1215 Seam Sealer</b>
<u>PRODUCT DESCRIPTION:</u>	Silicone Seam Sealant
<u>CHEMICAL NAME/CLASS:</u>	Polydimethylsiloxane Silicone
<u>SYNONYMS:</u>	Silicone Sealant
<u>RELEVANT USE:</u>	High Performance Silicone Narrow Joint Sealer
<u>USES ADVISED AGAINST:</u>	Other Than Relevant Use

#### COMPANY/UNDERTAKING IDENTIFICATION:

<u>SUPPLIER/MANUFACTURER'S NAME:</u>	<b>Pecora Corporation</b>
<u>ADDRESS:</u>	165 Wambold Road, Harleysville, PA 19438
<u>EMERGENCY PHONE:</u>	800-424-9300 (CHEMTREC, 24-hours)
<u>BUSINESS PHONE:</u>	215-723-6051 (Mon–Fri, 8 AM–5 PM ET)

<u>PREPARATION DATE:</u>	February 17, 2010
<u>REVISION DATE:</u>	January 26, 2017

This product is sold for commercial use. This SDS has been developed to address safety concerns of those individuals working with bulk quantities of this material, as well as those of potential users of this product in industrial/occupational settings. ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS 2015 and the Global Harmonization required information is included in appropriate sections based on the Global Harmonization Standard format. This product has been classified in accordance with the hazard criteria of the countries listed above and the SDS contains all the information required by the Canadian WHMIS 2015 [HPR-GHS], the Global Harmonization Standard and OSHA 1910.120.

### 2. HAZARD IDENTIFICATION

**GLOBAL HARMONIZATION LABELING AND CLASSIFICATION:** Classified in accordance with Global Harmonization Standard under U.S. OSHA Hazard Communication Standard, Canadian WHMIS HPR-GHS 2015.

**Classification:** Flammable Liquid Cat. 3, Reproductive Toxicity Cat. 2, Eye Irritation Cat. 2A, Skin Sensitization Cat. 1, STOT (Central Nervous System) SE Cat. 3, STOT (Thymus) SE Cat. 1, STOT (Blood) RE Cat. 2, Aquatic Chronic Toxicity Cat. 2

**Signal Word:** Danger

**Hazard Statement Codes:** H226, H361fd, H341, H319, H317, H336, H370, H373, H411

**Precautionary Statement Codes:** P201, P202, P210, P240, P241, P242, P243, P260, P264, P270, P271, P272, P273, P280, P370 + P378, P308 + P313, P305 + P351 + P338, P337 + P313, P303 + P361 + P353, P333 + P313, P304 + P340, P321, P391, P403 + P233 + P235, P405, P501

**Hazard Symbols/Pictogram:** GHS02, GHS07, GHS08, GHS09



#### EMERGENCY OVERVIEW:

**Physical Description:** This product is a smooth, translucent paste with a solvent odor and is flammable.

**Health Hazards:** WARNING! Contains compound that may cause harm to fetus (based on animal data) and other trace compound that is a suspect reproductive toxin and is a suspect mutagen. May cause eye irritation, especially if exposure is prolonged. May be harmful if ingested. May cause skin sensitization in susceptible individuals. Inhalation of vapors may cause central nervous system effects. Contains compounds may cause adverse effects to the cardiovascular system upon prolonged exposure. Contains trace compound that can cause adverse effects to the thymus.

**Flammability Hazard:** This product is flammable and can ignite if exposed to temperature at or above its flash point [40°C (104°)] or direct flame.

**Reactivity Hazard:** This product is not normally reactive. Reacts slowly with water to produce methanol and methyl ethyl ketoxime.

**Environmental Hazard:** This product has not been tested for environmental impact. Several components are considered acute and/or chronic aquatic toxins, which may cause acute or long-term harm to aquatic organisms. Release of large quantity may cause harm to terrestrial and aquatic organisms.

#### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®)

<b>Health</b>	<b>2*</b>
<b>Flammability</b>	<b>2</b>
<b>Physical Hazard</b>	<b>0</b>

See Section 16 for definitions of ratings

0 = Minimal                      3 = Serious  
1 = Slight                        4 = Severe  
2 = Moderate                    \* = Chronic

HMIS® is a registered trademark of the National Paint and Coatings Association.

**CANADIAN WHMIS (HPR-GHS) 2015 CLASSIFICATION AND SYMBOLS:** See Section 16 for in Classification and Symbols under HPR-GHS 2015.

**U.S. OSHA REGULATORY STATUS:** This material has a classification under the Global Harmonization Standard, as applied under OSHA regulations, as given earlier in this Section.

### 3. MATERIAL IDENTIFICATION

Chemical Name	CAS #	W/W%	LABEL ELEMENTS GHS Classification under U.S. OSHA Hazard Communication Standard & Canadian WHMIS (HPR-GHS) 2015 Hazard Statement Codes
Proprietary Polydimethyl Siloxane Contains the following compound		50.0-85.0	NOTIFIED CLASSIFICATION Classification: Eye Irritation Cat. 2A Hazard Statement Codes: H319
Octamethylcyclotetra-siloxane	556-67-2	>= 0.02 to < 0.6	HARMONISED CLASSIFICATION AND LABELLING (CLP00) Classification: Reproductive Toxicity Cat. 2, Aquatic Chronic Toxicity Cat. 4 Hazard Statement Codes: H361f, H413 ADDITIONAL SELF-CLASSIFICATION Classification: Flammable Liquid Cat. 3, Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4 Hazard Statement Codes: H226, H302 + H312
Mineral Spirits (contains less than 0.1% benzene)		10.0-20.0	HARMONISED CLASSIFICATION - ANNEX VI OF REGULATION (EC) NO 1272/2008 (CLP REGULATION) Classification: Aspiration Hazard Cat. 1 Hazard Statement Codes: H304 ADDITIONAL SELF-CLASSIFICATION Classification: Flammable Liquid Cat. 3, Skin Irritation Cat. 2, STOT (Central Nervous System) SE Cat. 3, Aquatic Chronic Cat. 2 Hazard Statement Codes: H226, H315, H336, H411
Proprietary Silica		5.0-10.0	SELF CLASSIFICATION Classification: Combustible Dust Hazard Hazard Statement Codes: Not Applicable
Proprietary Oximino Silane		1.0-8.0	NOTIFIED CLASSIFICATION Classification: Flammable Liquid Cat. 3, Skin Sensitization Cat. 1B, Eye Irritation Cat. 2A, STOT (Cardiovascular and Blood Effects) RE Cat. 2 Hazard Statement Codes: H226, H317, H319, H373
Xylene	1330-20-7	1.0-3.0	HARMONISED CLASSIFICATION - ANNEX VI OF REGULATION (EC) NO 1272/2008 (CLP REGULATION) Classification: Flammable Liquid Cat. 3, Acute Inhalation Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4, Skin Irritation Cat. 2 Hazard Statement Codes: H226, H312 + H332, H315 ADDITIONAL SELF-CLASSIFICATION Classification: Reproductive Toxicity Cat. 2, Aspiration Hazard, Acute Oral Toxicity Cat. 5 Hazard Statement Codes: H361d, H304, H303
Proprietary Oximino Silane		0.1-0.2	NOTIFIED CLASSIFICATION Classification: Eye Damage Cat. 1A, Acute Skin Sensitization Cat. 1B, Acute Inhalation Toxicity Cat. 4 Hazard Statement Codes: H318, H317, H332 ADDITIONAL SELF-CLASSIFICATION Classification: Flammable Liquid Cat. 4, Acute Oral Toxicity Cat. 5, Acute Dermal Toxicity Cat. 5 Hazard Statement Codes: H227, H303 + H313
Proprietary Amine Cross-Linker		0.1-0.2	NOTIFIED CLASSIFICATION Classification: Skin Corrosion Cat. 1B, Skin Sensitization Cat. 1B, Aquatic Chronic Toxicity Cat. 2 Hazard Statement Codes: H314, H317, H411
Dibutyltin bis(2-ethylhexoate)	2781-10-4	0.1-0.2	NOTIFIED CLASSIFICATION Classification: Reproductive Toxicity Cat. 1B, Germ Cell Mutagen Cat. 2, Skin Corrosion Cat. 1B, Acute Oral Toxicity Cat. 4, Skin Sensitization Cat. 1B, STOT (Thymus) SE Cat. 1, Aquatic Acute Toxicity Cat. 1, Aquatic Chronic Toxicity Cat. 1 Hazard Statement Codes: H360Df, H341, H314, H302, H317, H372, H410
Other trace components. Each of the other components is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).		Balance	Classification: Not Applicable

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

### 4. FIRST-AID MEASURES

**PROTECTION OF FIRST AID RESPONDERS:** Rescuers should not attempt to retrieve victims of exposure to this material without adequate personal protective equipment. Rescuers should be taken for medical attention, if necessary.

**DESCRIPTION OF FIRST AID MEASURES:** Remove victim(s) to fresh air, as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Remove and isolate contaminated clothing and shoes. Seek immediate medical attention. Take copy of label and MSDS to physician or other health professional with victim(s).

**Inhalation:** If aerosols or particulates from the product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

**Skin Exposure:** If the product contaminates the skin and adverse effect occurs, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Do not interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

**Eye Exposure:** If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 20 minutes. Do not interrupt flushing.

**Ingestion:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directly by medical personnel. Have victim rinse mouth with water or give several cupfuls of water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Dermatitis or other pre-existing 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.

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## 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** 40°C (104°)

**AUTOIGNITION:** Unknown.

**FLAMMABLE LIMITS IN AIR:** Unknown.

### **EXTINGUISHING MEDIA:**

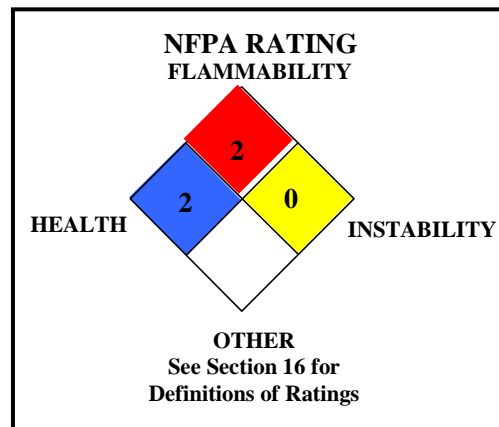
**Suitable Extinguishing Media:** Use extinguishing material suitable to the surrounding fire, including foam, halon, carbon dioxide and dry chemical.

**Unsuitable Extinguishing Media:** None known.

### **PROTECTION OF FIREFIGHTERS:**

**Special Hazards Arising From The Substance:** This product is combustible and can be ignited when exposed to its flashpoint. Not sensitive to mechanical impact under normal conditions. Not sensitive to static discharge under normal conditions. Closed containers may develop pressure and rupture in event of fire. Contact with water can generate flammable methanol and methyl ethyl ketoxime.

**Special Protective Actions For Fire-Fighters:** Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.



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## 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES:** An accidental release can result in a fire. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. Use only non-sparking tools and equipment during the response. The atmosphere must at least 19.5 percent Oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection.

**PERSONAL PROTECTIVE EQUIPMENT:** Responders should wear the level of protection appropriate to the type of chemical released, the amount of the material spilled, and the location where the incident has occurred.

**Small Spills:** For releases of 1 drum or less, Level D Protective Equipment (gloves, chemical resistant apron, boots, and eye protection) should be worn.

**Large Spills:** Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit, fire-retardant clothing and boots, hard hat, and Self-Contained Breathing Apparatus.**

### **METHODS FOR CLEAN-UP AND CONTAINMENT:**

**All Spills:** Access to the spill area should be restricted. Spread should be limited by gently covering the spill with polypads. Scrape up or pick-up spilled material, placing in suitable containers. Absorb any residual on appropriate material, such as sand. All contaminated absorbents and other materials should be placed in an appropriate container and seal. Do not mix with wastes from other materials. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). Dispose of recovered material and report spill per regulatory requirements. Remove all residue before decontamination of spill area. Clean spill area with soap and copious amounts of water.

**ENVIRONMENTAL PRECAUTIONS:** Minimize use of water to prevent environmental contamination. Prevent spill or rinsate from contaminating storm drains, sewers, soil or groundwater. Place all spill residues in a suitable container and seal. Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

**OTHER INFORMATION:** U.S. regulations may require reporting of spills of this material that reach surface waters if a sheen is formed. If necessary, the toll-free phone number for the US Coast Guard National Response Center is 1-800-424-8802.

**REFERENCE TO OTHER SECTIONS:** See information in Section 8 (Exposure Controls – Personal Protection) and Section 13 (Disposal Considerations) for additional information.

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## 7. HANDLING and STORAGE

**PRECAUTIONS FOR SAFE HANDLING:** As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid contact with eyes, skin, and clothing. Avoid breathing fumes, dusts, vapors or mist. Do not taste or swallow. Use only with adequate ventilation. Keep away from heat and flame. In the event of a spill, follow practices indicated in Section 6: ACCIDENTAL RELEASE MEASURES.

**CONDITIONS FOR SAFE STORAGE:** This product is stable under ordinary conditions of handling, use and storage. 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). Keep container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. To prolong shelf life, store at temperatures below 26°C (80°F).

**PRODUCT END USE:** This product is used as a sealant. Follow all industry standards for use of this product.

## 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 below.

**Occupational/Workplace Exposure Limits/Guidelines:**

Chemical Name	CAS #	Guideline	Value
Amino Silane	Proprietary	NE	NE
Amine-Based Crosslinker	Proprietary	NE	NE
Dibutyltin bis(2-ethylhexoate) Exposure limits given are for tin, organic compounds, as Sn	2781-10-4	ACGIH TLVs TWA ACGIH TLVS STEL OSHA PEL TWA NIOSH REL TWA DFG MAKs TWA DFG MAKs PEAK DFG MAK PREGNANCY CLASSIFICATION	0.1 mg/m <sup>3</sup> (skin) 0.2 mg/m <sup>3</sup> (skin) 0.1 mg/m <sup>3</sup> (skin) 0.1 mg/m <sup>3</sup> (skin) 0.1 mg/m <sup>3</sup> (inhalable fraction) 2•MAK 15 min. Average value, 1-hr interval, 4 per shift D
Proprietary Silica	Proprietary	NE	NE
Mineral Spirits Exposure limits given are for Petroleum Distillates, Naphtha	Proprietary	OSHA PEL TWA NIOSH REL TWA NIOSH REL STEL	2000 mg/m <sup>3</sup> 300 mg/m <sup>3</sup> 1800 mg/m <sup>3</sup> , 15 minutes
Octamethylcyclotetrasiloxane	556-67-2	NE	NE
Proprietary Polydimethyl Siloxane	Proprietary	NE	NE
Proprietary Oximino Silane	Proprietary	NE	NE
Xylene	1330-20-7	ACGIH TLVs TWA ACGIH TLVS STEL OSHA PEL TWA OSHA PEL STEL NIOSH REL TWA NIOSH STEL/CEIL(C) DFG MAKs TWA DFG MAKs PEAK DFG MAK PREGNANCY CLASSIFICATION	100 ppm 150 ppm 100 ppm 150 ppm (vacated 1989 PEL) 100 ppm 150 ppm 100 ppm (skin) 2•MAK 15 min. Average value, 1-hr interval, 4 per shift (skin) D
The following compounds are possible reaction products from contact with water:			
Methanol	67-56-1	ACGIH TLV TWA ACGIH TLV STEL OSHA PEL TWA OSHA PEL STEL NIOSH REL TWA NIOSH REL STEL NIOSH IDLH DFG MAK TWA DFG MAK PEAK DFG MAK Pregnancy Risk Classification	200 ppm (skin) 250 ppm (skin) 200 ppm 200 ppm [skin] (vacated 1989 PEL) 200 ppm (skin) 250 (skin) 6000 ppm 200 ppm 4•MAK 15 minute average value, 1-hr interval 4 per shift C
Methyl Ethyl Ketoxime	96-29-7	DFG MAK TWA AIHA WEEL TWA	Skin, Danger of Sensitization of the Skin 10 ppm (DSEN: May cause dermal sensitization)

NE = Not Established. See Section 16 for Definitions of Terms Used.

**Biological Exposure Indices (BEIs):** There are no BEI's established for any component of this product at this time. The following BEIs are in force for the hydrolysis product, methanol

CHEMICAL: DETERMINANT	SAMPLING TIME	BEI
Methanol • Methanol in Urine	• End of Shift	• 15 mg/L
Xylenes • Methylhippuric acids in urine	• End of Shift	• 1.5 g/g creatinine

**PERSONAL PROTECTIVE EQUIPMENT (PPE):** 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 the Respiratory Protection Standard (29 CFR 1910.134), Eye Protection Standard 29 CFR 1910.13, the Hand Protection Standard 29 CFR 1910.138, and the Foot Protection Standard 29 CFR 1910.136), equivalent standards of Canada (including the Canadian CSA Respiratory Standard Z94.4-93-02, the CSA Eye Protection Standard Z94.3-M1982, Industrial Eye and Face Protectors and the Canadian CSA Foot Protection Standard Z195-M1984, Protective Footwear). Please reference applicable regulations and standards for relevant details.

**Eye/Face Protection:** Use approved safety goggles or safety glasses. If necessary, refer to appropriate regulations and standards.

**Skin Protection:** Wear chemical impervious gloves (e.g., Nitrile or Neoprene). Use triple gloves for spill response. If necessary, refer to appropriate regulations and standards.

**Body Protection:** Use body protection appropriate for task (e.g., lab coat, coveralls, Tyvek suit). If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada. 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 and standards.

**Respiratory Protection:** If mists, sprays or particulates from this product are created during use, use appropriate respiratory protection. If necessary, use only respiratory protection authorized in appropriate regulations. Oxygen levels below 19.5% are considered IDLH by 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 appropriate regulations and standards.

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## 9. PHYSICAL and CHEMICAL PROPERTIES

**FORM:** Smooth paste.

**MOLECULAR WEIGHT:** Mixture.

**ODOR:** Mild solvent.

**SPECIFIC GRAVITY:** 0.95-1.2

**RELATIVE VAPOR DENSITY (air = 1):** Heavier than air.

**SOLUBILITY IN WATER:** Soluble.

**MELTING/FREEZING POINT:** Not available.

**VOC (less water and exempt):** 213 g/L

**FLASH POINT:** 40°C (104°)

**pH:** Not available.

**FLAMMABLE LIMITS (in air by volume, %):** Lower: Not established; Upper: Not established.

**COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT):** Not established.

**HOW TO DETECT THIS SUBSTANCE (IDENTIFYING PROPERTIES):** The appearance of this product may act as an identifying property in the event of an accidental release.

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**COLOR:** Translucent.

**MOLECULAR FORMULA:** Mixture.

**ODOR THRESHOLD:** Not available.

**VAPOR PRESSURE, mm Hg @ 20°C:** Not established.

**EVAPORATION RATE (BuAc = 1):** < 1

**OTHER SOLUBILITIES:** Not available.

**BOILING POINT:** Not established.

**WEIGHT % VOC:** 14-22%

**AUTOIGNITION TEMPERATURE:** Not established.

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## 10. STABILITY and REACTIVITY

**CHEMICAL STABILITY:** Stable under normal circumstances of use and handling. Methylene Ketoxime may be generated during curing.

**CONDITIONS TO AVOID:** Avoid contact with incompatible chemicals and exposure to extreme temperatures.

**INCOMPATIBLE MATERIALS:** This product is not compatible with strong acids and oxidizers and ferric chloride.

**HAZARDOUS DECOMPOSITION PRODUCTS:** **Combustion:** Thermal decomposition of this product can generate dusts, irritating fumes, and toxic gases (e.g., carbon, nitrogen and silicone oxides, silicon, dimethyl ether, methane, hydrogen gas, aminoethylene, carbon, ammonia, carbon monoxide, formaldehyde, and other low molecular weight hydrocarbons). **Hydrolysis:** Methylene ketoxime and methanol.

**POSSIBILITY OF HAZARDOUS REACTIONS/POLYMERIZATION:** This product is not expected to undergo hazardous polymerization, decomposition, condensation, or self-reactivity.

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## 11. TOXICOLOGICAL INFORMATION

**POTENTIAL HEALTH EFFECTS:** The most significant routes of occupational exposure are inhalation and contact with skin and eyes.

The symptoms of exposure to this product are as follows:

**Contact with Skin or Eyes:** Contact may mildly irritate the skin and cause redness and discomfort. Prolonged or repeated skin contact may cause dermatitis (dry, red skin). Eye contact may cause redness, pain, and tearing. Skin contact may cause sensitization and allergic reaction in susceptible individuals. Symptoms may include redness, itching and rash.

**Skin Absorption:** Some components of this product are known to be absorbed through intact skin. Skin contact may cause some systemic effects if a large area of skin is contaminated.

**Ingestion:** If the product is swallowed, it may mildly irritate the mouth, throat, and other tissues of the gastro-intestinal system and may cause nausea, vomiting, and diarrhea. Due to the Methylated Ketoxime Silane mixture, ingestion may produce blood effects, reducing the blood's ability to transport oxygen (methemoglobinemia and anemia). Reversible narcotic effects may occur.

**Inhalation:** Exposure to vapors of this product generated during curing, or dusts of this product generated during use after curing may mildly irritate the respiratory tract and cause coughing and sneezing. Vapors or fumes when used in an enclosed space, if heated or during curing may cause irritation of the respiratory system. Symptoms include nose irritation, dry or sore or burning throat, runny nose, shortness of breath, dizziness, incoordination. Vapors from decomposition or exposure to atmospheric moisture may produce reversible narcotic effect due to formation of methanol. Narcotic effects can include dizziness, headache, nausea, vomiting, chest tightness, limb weakness, staggering gait, confusion. In severe cases, there may be restlessness, convulsions, coma.

**Injection:** Accidental injection of this product (e.g. puncture with a contaminated object) may cause burning, redness, and swelling in addition to the wound.

**TARGET ORGANS:** **Acute:** Skin, eyes, respiratory system. **Chronic:** Skin, cardiovascular system, thymus, blood system.

**CHRONIC EFFECTS:** Prolonged or repeated skin contact may cause dermatitis (dry, red skin), sensitization to the skin or adverse liver or kidney effects. Based on animal data, the Xylene component may cause harm to the fetus during pregnancy. Due to trace Dibutyltin bis(2-ethylhexoate), this product poses harm to the fetus if exposure occurs during pregnancy and possible mutagenic effects.

**TOXICITY DATA:** There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1% in concentration. Due to large amount of data for components, only Human data, Irritancy data, LD50 Oral-Rat, LD50 Oral-Mouse, LD50 Skin-Rat, LD50 Skin-Rabbit, LC50 Inhalation-Rat, LC50 Inhalation-Mouse and select reproductive toxicity data are provided in this SDS. Contact Pecora for information on additional data.

### FUMED SILICA:

LC<sub>50</sub> (Inhalation-Rat) 450 mg/m<sup>3</sup>/4 hours: Behavioral: somnolence (general depressed activity);

Lungs, Thorax, or Respiration: dyspnea Lungs, Thorax, or Respiration: other changes

LC<sub>50</sub> (Inhalation-Rat) > 2280 mg/m<sup>3</sup>/1 hour: Lungs, Thorax, or Respiration: other changes

LD<sub>50</sub> (Oral-Rat) >5000 mg/kg

### MINERAL SPIRITS:

Standard Draize Test (Eye-Human) 100 ppm: Mild

Standard Draize Test (Eye-Rabbit) 500 mg/24 hours: Moderate

LC<sub>50</sub> (Inhalation-Rat) > 1400 ppm/8 hours

### POLYDIMETHYLSILOXANE:

Standard Draize Test (Skin-Rabbit) 500 µL/24 hours: Mild

Standard Draize Test (Eye-Rabbit) 100 µL/24 hours: Mild

LD<sub>50</sub> (Oral-Rat) > 24 gm/kg: Gastrointestinal: hypermotility, diarrhea

### POLYDIMETHYLSILOXANE (continued):

LD<sub>50</sub> (Oral-Rat) > 17 gm/kg: Kidney/Ureter/Bladder: other changes; Nutritional and Gross Metabolic: other changes

LD<sub>50</sub> (Skin-Rabbit) > 2 gm/kg: Behavioral: food intake (animal); Gastrointestinal: hypermotility, diarrhea; Skin and Appendages: dermatitis, other (after systemic exposure)

### XYLENE:

Standard Draize Test (Eye-Human) 200 ppm

LDLo (Oral-Human) 50 mg/kg

LCLo (Inhalation-Human) 10,000 ppm/6 hours: Behavioral: general anesthetic; Lungs, Thorax, or Respiration: cyanosis; Blood: other changes

TCLo (Inhalation-Human) 200 ppm: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Sense Organs and Special Senses (Eye): conjunctive irritation; Lungs, Thorax, or Respiration: other changes

Standard Draize Test (Skin-Rabbit) 100%: Moderate

## 11. TOXICOLOGICAL INFORMATION (Continued)

### TOXICITY DATA (continued):

#### XYLENE (continued):

Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Moderate  
 Standard Draize Test (Eye-Rabbit) 87 mg/L: Mild  
 Standard Draize Test (Eye-Rabbit) 5 mg/24 hours: Severe  
 Open Irritation Test (Skin-Rat) 60 uL/8 hours: Mild  
 LC<sub>50</sub> (Inhalation-Rat) 5000 ppm/4 hours

#### XYLENE (continued):

LC<sub>50</sub> (Inhalation-Mammal-Species Unspecified) 30 gm/m<sup>3</sup>  
 LD<sub>50</sub> (Oral-Rat) 4300 mg/kg: Liver: other changes; Kidney/Ureter/Bladder: other changes  
 LD<sub>50</sub> (Oral-Mouse) 2119 mg/kg  
 LD<sub>50</sub> (Oral-Mammal-Species Unspecified) 4300 mg/kg  
 LD<sub>50</sub> (Skin-Rabbit) > 1700 mg/kg

**CARCINOGENIC POTENTIAL:** The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be or suspected to be a carcinogen by the listed agency, see section 16 for definitions of other ratings.

CHEMICAL	EPA	IARC	NTP	NIOSH	ACGIH	OSHA	DFG MAK	PROP 65
Amino Alkoxysilane	No	No	No	No	No	No	No	No
Amine-Based Crosslinker	No	No	No	No	No	No	No	No
Dibutyl bis(2-ethylhexoate) As an organic tin compound	No	No	No	No	A4	No	No	No
Fumed Silica	No	No	No	No	No	No	No	No
Proprietary Oximino Silane	No	No	No	No	No	No	No	No
Mineral Spirits	No	No	No	No	No	No	No	No
Proprietary Polydimethyl Siloxane	No	No	No	No	No	No	No	No
Xylene	I	3	No	No	A4	No	No	No
The following are compounds from reaction with water:								
Methanol	No	No	No	No	No	No	No	No
Methyl Ethyl Ketoxime	No	No	No	No	No	No	MAK-2	No

ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); EPA-I (Data are Inadequate for an Assessment of Human Carcinogenic Potential); IARC-3 (Unclassifiable as to Carcinogenic in Humans); MAK-2 (Substances that are Concerned to Be Carcinogenic for Man because Sufficient Data from Long-Term Animal Studies or Limited Evidence from Animal Studies Substantiated by Evidence from Epidemiological Studies Indicate that They Can Make Significant Contribution to Cancer Risk.)

In addition, male rats and mice exposed to methyl ethyl ketimine (a by-product that can be produced after contact with water) throughout their lifetimes developed liver tumors. Many commonly used chemicals cause liver tumors in rats and mice. The relevance to humans is uncertain.

**IRRITANCY OF PRODUCT:** This product may mildly irritate contaminated tissue, especially if contact is prolonged. Eye irritation may be more pronounced.

**SENSITIZATION TO THE PRODUCT:** This product may cause skin sensitization and allergic reaction in susceptible individuals due to the Amino Silane, Dibutyltin bis(2-ethylhexoate), Methylated Ketoxime Silane Mixture components.

**TOXICOLOGICAL SYNERGISTIC PRODUCTS:** There have been several studies in humans and animals on the interaction of xylenes with drugs, alcohol and other solvents. Xylene has a high potential to interact with other compounds because it increases metabolic enzymes in the liver and decreases metabolic enzymes in the lungs. In general, exposure to related solvents, such as benzene, toluene and ethanol (alcohol) slows the rate of clearance of xylenes from the body, thus enhancing its toxic effects. In rats, exposure to xylene (mixed isomers; unspecified composition) in combination with the solvents trichloroethylene or chlorobenzene has had an additive effect in causing hearing loss, while exposure to xylene (mixed isomers) enhanced the hearing loss caused by n-hexane and decreased the toxicity of n-hexane on peripheral nerves.

**REPRODUCTIVE TOXICITY INFORMATION:** This product has not been tested for reproductive toxicity. Information for some components is given, as follows.

**Mutagenicity/Embryotoxicity/ Teratogenicity/Reproductive Toxicity:** Although no specific information is available, the Dibutyltin bis(ethylhexoate) component is classified by the EU ECHA as having reproductive toxicity and potential mutagenic effects. In a developmental and reproductive toxicity study involving female rats and the trace Octamethylcyclotetrasilane component, a significant percentage of female rats exposed experienced reduction of proestrus LH levels, a reduction of ovulation and decreased FSH hormone levels. Xylene (mixed isomers) are considered fetotoxic in humans, based on observations of reduced fetal weight, delayed ossification and persistent behavioral effects in animal studies in the absence of maternal toxicity. Other developmental effects have been observed in animal studies in the presence of maternal toxicity.

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**MOBILITY:** This product has not been tested for mobility in soil.

**PERSISTENCE AND BIODEGRADABILITY:** This product has not been tested for persistence or biodegradability.

**BIO-ACCUMULATION POTENTIAL:** This product has not been tested for bio-accumulation potential.

**ECOTOXICITY:** This product has not been tested for aquatic or animal toxicity. The following aquatic toxicity data are available for several components.

#### OCTAMETHYLCYCLOTETRAILOXANE:

LC<sub>50</sub> (*Oncorhynchus mykiss* Rainbow trout) 14 days = 10 µg/L  
 LC<sub>50</sub> (*Lepomis macrochirus* Bluegill) 96 hours = > 1000 mg/L  
 LC<sub>50</sub> (*Brachydanio rerio* Zebra danio) 96 hours = >500 mg/L

#### POLYDIMETHYLSILOXANE:

EC<sub>50</sub> (*Daphnia magna*) 24 hours = > 1000 mg/L  
 LC<sub>50</sub> (*Brachydanio rerio*) 96 hours = > 10,000 mg/L

#### XYLENE:

LD<sub>50</sub> (goldfish) 24 hours = 13 mg/L (conditions of bioassay not specified, no specific isomer)  
 LC<sub>50</sub> (rainbow trout) 96 hours = 13.5 mg/L (conditions of bioassay not specified, no specific isomer)  
 LC<sub>50</sub> (fathead minnow) 24-96 hours = 46 mg/L at 18-22°C, in a static bioassay (No specific isomer)  
 LC<sub>50</sub> (*Carassius auratus* goldfish) 96 hours = 16.9 ppm (conditions of bioassay not specified, no specific isomer)

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## 12. ECOLOGICAL INFORMATION (Continued)

OTHER ADVERSE EFFECTS: This material is not expected to have any ozone depletion potential.

ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

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## 13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: As supplied, this product would not be a hazardous waste as defined by U.S. federal regulation (40 CFR 261) if discarded or disposed. State and local regulations may differ from federal regulations. The generator of the waste is responsible for proper waste determination and management.

U.S. EPA WASTE NUMBER: Not applicable.

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## 14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: This product is classified as Dangerous Goods, per U.S. DOT regulations, under 49 CFR 172.101.

UN Identification Number:	UN 1133
Proper Shipping Name:	Adhesives, containing a flammable liquid
Hazard Class Number and Description:	3 (Flammable)
Packing Group:	PG III
DOT Label(s) Required:	Class 3 (Flammable)
North American Emergency Response Guidebook Number (2016):	28
Marine Pollutant:	This material is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is classified as Dangerous Goods, per regulations of Transport Canada.

UN Identification Number:	UN 1133
Proper Shipping Name:	Adhesives, containing a flammable liquid
Hazard Class Number and Description:	3 (Flammable)
Packing Group:	PG III
Hazard Shipping Label(s) Required:	Class 3 (Flammable)
Special Provisions:	83
Explosive Limit & Limited Quantity Index:	5
ERAP Index:	None
Passenger Carrying Ship Index:	None
Passenger Carrying Road or Rail Vehicle Index:	60

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA): This product is classified as dangerous goods, per the International Air Transport Association.

UN Identification Number:	UN 1133
Proper Shipping Name:	Adhesives, containing a flammable liquid
Hazard Class or Division:	3 (Flammable)
Hazard Label(s) Required:	Class 3 (Flammable)
Packing Group:	III
Excepted Quantities:	E1
Passenger and Cargo Aircraft Packing Instruction:	355
Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.:	60 L
Passenger and Cargo Aircraft Limited Quantity Packing Instruction:	Y344
Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.:	10 L
Cargo Aircraft Only Packing Instruction:	366
Cargo Aircraft Only Maximum Net Quantity per Pkg.:	220 L
ERG Code:	3L

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): This product is classified as dangerous goods, per the International Maritime Organization.

UN No.:	1133
Proper Shipping Name:	Adhesives, containing a flammable liquid
Hazard Class Number:	3 (Flammable)
Labels:	Class 3 (Flammable)
Packing Group:	III
Special Provisions:	223, 995
Limited Quantities:	5 L
Excepted Quantities:	E1
Packing:	Instructions: P001, LP01; Provisions: PP1
IBCs:	Instructions: IBC03; Provisions: None
Tanks:	Instructions: T2; Provisions: T2, TP1
EmS:	F-E, S-D
Stowage Category:	Category A.

Marine Pollutant: No component of this product is designated by the IMO to be a Marine Pollutant.

## 15. REGULATORY INFORMATION

### U.S. REGULATIONS:

U.S. SARA Reporting Requirements: No component of this product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

CHEMICAL	SECTION 302 EHS (TPQ) (40 CFR 355, Appendix A)	SECTION 304 RQ (40 CFR Table 302.4)	SECTION 313 TRI (threshold) (40 CFR 372.65)
Xylene	No	No	Yes

U.S. SARA Hazard Categories (Section 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No; SUDDEN RELEASE: No

U.S. TSCA Inventory Status: All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

U.S. CERCLA Reportable Quantity (RQ): Xylene = 100 lb (45.4 kg).

U.S. Clean Air Act (CA 112r) Threshold Quantity (TQ): The Xylene component is listed as a Hazardous Air Pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. This chemical is included on this list.

U.S. CLEAN WATER ACT REQUIREMENTS: The Xylene (mixed) component is designated as a hazardous substances under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): No component of this product is on the California Proposition 65 List.

### CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL or NDSL Inventories.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The Xylene component is on the CEPA Priority Substances 1 list, not considered as "TOXIC" under Section 64 of CEPA.

Canadian WHMIS (HPR-GHS) 2015 Classification and Symbols: See Section 16 for in Classification and Symbols under HPR-GHS 2015.

### MEXICAN REGULATIONS:

Mexican Workplace Regulations (NOM-018-STPS-2000): This product is not classified as hazardous.

## 16. OTHER INFORMATION

WARNINGS (per ANSI Z129.1): DANGER! FLAMMABLE VISCOUS LIQUID. CONTAINS TRACE COMPOUND THAT MAY CAUSE HARM TO FETUS AND IS A POTENTIAL MUTAGEN. MAY CAUSE EYE IRRITATION, ESPECIALLY IF EXPOSURE IS PROLONGED. MAY CAUSE SKIN SENSITIZATION AND ALLERGIC REACTION IN SUSCEPTIBLE INDIVIDUALS. CHRONIC EXPOSURE MAY CAUSE ADVERSE EFFECTS ON BLOOD AND THYMUS. CONTACT WITH WATER CAN PRODUCT METHANOL AND METHYL ETHYL KETOXIME, WHICH CAN CAUSE NARCOTIC EFFECTS. COMBUSTIBLE – CAN IGNITE IF EXPOSED TO DIRECT FLAME. Avoid contact with eyes, skin, and clothing. Avoid breathing fumes, dusts, vapors or mist. Do not taste or swallow. Wash thoroughly after handling. Keep container tightly closed. Use only with adequate ventilation. Keep away from heat and flame. Wear gloves, eye protection, respiratory protection, and appropriate body protection. FIRST-AID: In case of contact, immediately flush skin and eyes with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, foam, dry chemical, or CO<sub>2</sub>. IN CASE OF SPILL: Absorb spilled product with polypads or other suitable absorbing material. Place all spill residue in an appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations and those of Canada.

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: Classified in accordance with Global Harmonization Standard under U.S. OSHA Hazard Communication Standard, Canadian WHMIS HPR-GHS 2015.

Classification: Flammable Liquid Category 3, Reproductive Toxicity Category 2, Eye Irritation Category 2A, Skin Sensitization Category 1, Specific Target Organ Toxicity (Central Nervous System) Single Exposure Category 3, Specific Target Organ Toxicity (Thymus) Single Exposure Category 1, Specific Target Organ Toxicity (Blood) Repeated Exposure Category 2, Aquatic Chronic Toxicity Category 2

Signal Word: Danger

Hazard Statements: H226: Flammable liquid and vapour. H361Df: May damage the unborn child. Suspected of damaging fertility. H319: Causes serious eye irritation. H341: Suspected of causing genetic effects. H317: May cause an allergic skin reaction. H336: May cause drowsiness or dizziness. H370: Causes damage to organs. H373: May cause damage to organs through prolonged or repeated exposure. H411: Toxic to aquatic life with long-lasting effects.

Precautionary Statements:

Prevention: P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P260: Do not breathe gas/mist/vapours/spray. P210: Keep away from heat/sparks/open flames/hot surfaces. — No smoking. 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. P264: Wash thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P272: Contaminated work clothing should not be allowed out of the workplace. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection.



## 16. OTHER INFORMATION (Continued)

### GLOBAL HARMONIZATION LABELING AND CLASSIFICATION (continued):

#### Precautionary Statements (continued):

**Response:** P308 + P313: IF exposed or concerned: Get medical advice/attention. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. P337 + P313: If eye irritation persists: Get medical advice/attention. P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P333 + P313: If skin irritation or rash occurs, get medical attention. P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P321: Specific treatment (remove from exposure and treat symptoms). P391: Collect spillage.

**Storage:** P403 + P233 + P235: Store in a well-ventilated place. Keep container tightly closed. Keep cool. P405: Store locked up.

**Disposal:** P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

**Hazard Symbols/Pictogram:** GHS02, GHS07, GHS08, GHS09

### DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information presented in this Material Safety Data Sheet is presented in good faith based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. In no case shall the descriptions, information, data or designs provided be considered a part of our terms and conditions of sale.

All materials may present hazards and should be used with caution. Because many factors may affect processing or application/use, we recommend that you make tests to determine the suitability of a product for your particular purpose prior to use. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices or applicable federal, state, or local laws or regulations. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

**REFERENCES AND DATA SOURCES:** Contact the supplier for information.

**METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION:** Bridging principles were used to classify this product.

**REVISION DETAILS:** June 2012: Up-date and revise entire MSDS to include current GHS requirements. September 2012: Change of flash point and classification throughout the SDS. January 23, 2017: Change of formulation and up-date of entire SDS accordingly.

**DATE OF PRINTING**

January 31, 2017

## DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these, which are commonly used, include the following:

### KEY ACRONYMS:

**CHEMTREC:** Chemical Transportation Emergency Center, a 24-hour emergency information and/or emergency assistance to emergency responders.

**CEILING LEVEL:** The concentration that shall not be exceeded during any part of the working exposure.

**DFG MAKs:** Federal Republic of Germany Maximum Concentration Values in the workplace. Exposure limits are given as TWA (Time-Weighted Average) or PEAK (short-term exposure) values.

**DFG MAK Germ Cell Mutagen Categories:** **1:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances that 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. **3B:** Substances that 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 that 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.

**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. **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.

**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:** 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 there is a danger of cutaneous absorption.

**STEL:** 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 exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

**WEEL:** Workplace Environmental Exposure Limits from the AIHA.

### 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. Mechanical irritation may occur. PII or Draize = 0. **Eye Irritation:** Essentially non-irritating, minimal effects clearing in < 24 hours. Mechanical irritation may occur. Draize = 0. **Oral Toxicity LD<sub>50</sub> Rat:** > 5000 mg/kg. **Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:** > 2000 mg/kg. **Inhalation Toxicity 4-hrs LC<sub>50</sub> Rat:** > 20 mg/L. **1 Slight Hazard:** Minor reversible injury may occur; may irritate the stomach if swallowed; may defat the skin and exacerbate existing dermatitis. **Skin Irritation:** Slightly or mildly irritating. PII or Draize > 0 < 5. **Eye Irritation:** Slightly to mildly irritating, but reversible within 7 days. Draize > 0 < 25. **Oral Toxicity LD<sub>50</sub> Rat:** > 500-5000 mg/kg. **Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:** > 1000-2000 mg/kg. **Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:** > 2-20 mg/L. **2 Moderate Hazard:** Temporary or transitory injury may occur; prolonged exposure may affect the CNS. **Skin Irritation:** Moderately irritating; primary irritant; sensitizer. PII or Draize ≥ 5, with no destruction of dermal tissue. **Eye Irritation:** Moderately to severely irritating; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize = 26-100, with reversible effects. **Oral Toxicity LD<sub>50</sub> Rat:** > 50-500 mg/kg. **Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:** > 200-1000 mg/kg. **Inhalation Toxicity LC<sub>50</sub> 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 cause destruction of dermal tissue, skin burns, and 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<sub>50</sub> Rat:** > 1-50 mg/kg. **Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:** > 20-200 mg/kg. **Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:** > 0.05-0.5 mg/L. **4 Severe Hazard:** Life-threatening; major or permanent damage may result from single or repeated exposures; extremely toxic; irreversible injury may result from brief contact. **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<sub>50</sub> Rat:** ≤ 1 mg/kg. **Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:** ≤ 20 mg/kg. **Inhalation Toxicity LC<sub>50</sub> 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 requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. This usually includes the following: 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) (i.e. OSHA Class IIIB); and 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 with air. This usually includes the following: 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); and Solids and semisolids (e.g. viscous and slow flowing as asphalt) that readily give off flammable vapors. **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. This usually includes the following: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 38°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. 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); and Materials that burn extremely rapidly, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides).

## DEFINITIONS OF TERMS (Continued)

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

**FLAMMABILITY HAZARD (continued): 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 that will burn readily. This usually includes the following: 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) (i.e. OSHA Class IA); and Materials that ignite spontaneously when exposed to air at a temperature of 54.4°C (130°F) or below (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. **Compressed Gases:** No Rating. **Pyrophorics:** No Rating. **Oxidizers:** No 0 rating. **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 violently. **Explosives:** Division 1.5 & 1.6 explosives. 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 oxidizers; 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 explosion 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 explosives. Explosive substances where the explosive effects 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:** Packaging Group II oxidizers. 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. **Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential (or low risk) 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 1.3 explosives. 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:** Packaging Group I oxidizers. 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 (or moderate risk) 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 explosives. 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 (or high risk) to cause significant heat generation or explosion. **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 (or high risk) 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 with an LC<sub>50</sub> for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC<sub>50</sub> for acute inhalation toxicity greater than 200 mg/L. Materials with an LD<sub>50</sub> for acute dermal toxicity greater than 2000 mg/kg. Materials with an LD<sub>50</sub> for acute oral toxicity greater than 2000 mg/kg. Materials essentially non-irritating to the respiratory tract, eyes, and skin. **1** Materials that, under emergency conditions, can cause significant irritation. Gases and vapors with an LC<sub>50</sub> for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an LC<sub>50</sub> for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L. Materials with an LD<sub>50</sub> for acute dermal toxicity greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials that slightly to moderately irritate the respiratory tract, eyes and skin. Materials with an LD<sub>50</sub> for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC<sub>50</sub> for acute inhalation toxicity greater than 3,000 ppm but less than or equal to 5,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> 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. Dusts and mists with an LC<sub>50</sub> for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LD<sub>50</sub> for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. 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. Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg.

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

**HEALTH HAZARD (continued): 3** Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC<sub>50</sub> for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LC<sub>50</sub> for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD<sub>50</sub> for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD<sub>50</sub> for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an LC<sub>50</sub> for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 1000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is less than or equal to 5 mg/kg.

**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 of NFPA 704. **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 according with Annex D of NFPA 704. 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 Recommendations 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% 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 the 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). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **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 with 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% 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 (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 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% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **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% 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 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 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 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 are sensitive to localized thermal or mechanical shock 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.

## DEFINITIONS OF TERMS (Continued)

### FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). **Flash Point:** Minimum temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. **Autoignition Temperature:** Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. **LEL:** Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. **UEL:** Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

### 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. **LD<sub>50</sub>:** Lethal Dose (solids & liquids) that kills 50% of the exposed animals. **LC<sub>50</sub>:** Lethal Concentration (gases) that kills 50% of the exposed animals. **ppm:** Concentration expressed in parts of material per million parts of air or water. **mg/m<sup>3</sup>:** 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. **TDLo:** Lowest dose to cause a symptom. **TCLo:** Lowest concentration to cause a symptom. **TD<sub>0</sub>, LDLo, and LD<sub>0</sub>, or TC, TC<sub>0</sub>, LCLo, and LC<sub>0</sub>:** Lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** **IARC:** International Agency for Research on Cancer. **NTP:** National Toxicology Program. **RTECS:** Registry of Toxic Effects of Chemical Substances. 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.

**REPRODUCTIVE INFORMATION:** A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process.

### ECOLOGICAL INFORMATION:

**EC:** Effect concentration in water. **BCF:** Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. **TLM:** Median threshold limit. **log K<sub>OW</sub>** or **log K<sub>OC</sub>:** Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

**REGULATORY INFORMATION:** This section explains the impact of various laws and regulations on the material.

### U.S.:

**EPA:** U.S. Environmental Protection Agency. **ACGIH:** American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits. **OSHA:** U.S. Occupational Safety and Health Administration. **NIOSH:** National Institute of Occupational Safety and Health, which is the research arm of OSHA. **DOT:** U.S. Department of Transportation. **TC:** Transport Canada. **SARA:** Superfund Amendments and Reauthorization Act. **TSCA:** U.S. Toxic Substance Control Act. **CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollutant status according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

### CANADA:

**WHMIS:** Canadian Workplace Hazardous Materials Information System. **TC:** Transport Canada. **DSL/NDL:** Canadian Domestic/Non-Domestic Substances List.