SAFETY DATA SHEET

Pecora BA-98

1. PRODUCT IDENTIFICATION

IDENTIFICATION of the SUBSTANCE or PREPARATION

<table>
<thead>
<tr>
<th>TRADE NAME (AS LABELED):</th>
<th>Pecora BA-98</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT DESCRIPTION:</td>
<td>Non-Skinning Butyl Rubber Sealant</td>
</tr>
<tr>
<td>CHEMICAL NAME/CLASS:</td>
<td>Solvent/Carbonate Mixture</td>
</tr>
<tr>
<td>SYNONYMS:</td>
<td>BA-98</td>
</tr>
<tr>
<td>RELEVANT USE:</td>
<td>One Part Butyl Rubber Sealant</td>
</tr>
<tr>
<td>USES ADVISED AGAINST:</td>
<td>Other Than Relevant Use</td>
</tr>
</tbody>
</table>

COMPANY/UNDERTAKING IDENTIFICATION:

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

PREPARATION DATE: June 2009

REVISION DATE: April 8, 2015

This product is sold for commercial use. This MSDS 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, and Canadian WHMIS [Controlled Products Regulations] and the Global Harmonization Standard required information is included in appropriate sections based on the U.S. ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: This product has been classified per GHS Standards.

Classification: Carcinogenic Cat. 1B, Mutagenic Cat. 1B, Combustible Liquid Cat. 4, Acute Oral Toxicity Cat. 5, Eye Irritation Cat. 2B, Skin Irritation Cat. 2

Signal Word: Danger


Hazard Symbols/Pictogram: GHS07, GHS08

EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: This product is a gray, elastomeric solid (paste) with a solvent/hydrocarbon odor.

HEALTH HAZARDS: CAUTION! Harmful if ingested. Inhalation of fumes if heated may be harmful. Prolonged skin contact may cause irritation. May cause eye irritation. Limited evidence of mutagenic effect from animal exposure. Contains compounds that are suspect carcinogens and trace amounts of crystalline silica, a known human carcinogen by inhalation.

FLAMMABILITY HAZARD: This product is combustible and can ignite if exposed to high temperature for a prolonged period or direct flame. See Section 5 (Fire-Fighting Measures) for additional information.

REACTIVITY HAZARD: This product is not reactive.

ENVIRONMENTAL HAZARD: This product has not been tested for environmental impact. All release to the environment should be avoided.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®)

<table>
<thead>
<tr>
<th>Health</th>
<th>2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>2</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
</tr>
</tbody>
</table>

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 CLASSIFICATION: Class D2B. See Section 15 (Regulatory Information) for all classification details.

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>W/W%</th>
<th>GHS Classification Hazard Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic Calcium Carbonate</td>
<td>471-34-1</td>
<td>30.0-60.0</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Stoddard Solvent</td>
<td>8052-41-3</td>
<td>10-30</td>
<td>Classification: Carcinogenic Cat. 1B, Mutagenic Cat. 1B, Aspiration Toxicity Cat. 1 Hazard Statement Codes: H3350, H3340, H3304</td>
</tr>
<tr>
<td>Magnesium Carbonate</td>
<td>546-93-0</td>
<td>3.0-7.0</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Amorphous Silicon Dioxide</td>
<td>7631-86-9</td>
<td>3.0-7.0</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Calcium Oxide</td>
<td>1305-78-8</td>
<td>0.5-1.5</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Kaolin</td>
<td>1332-58-7</td>
<td>0.5-1.5</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>1333-86-4</td>
<td>0.1-1.0</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>Trace</td>
<td>SELF CLASSIFICATION Classification: Carcinogenic Cat. 1B Hazard Statement Codes: H3350</td>
</tr>
</tbody>
</table>

See Section 16 for full text of classification

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 fumes are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

SKIN EXPOSURE: If the material contaminates the skin, 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 material 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 overexposure to this product.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: 40°C (104°F) 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.
- 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.
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. Scraps 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.

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:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS#</th>
<th>Guideline</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amorphous Silicon Dioxide</td>
<td>7631-86-9</td>
<td>OSHA PEL TWA</td>
<td>15 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>10 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Calcium Carbonate, Synthetic</td>
<td>471-54-1</td>
<td>ACGIH TLV TWA</td>
<td>2 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Calcium Oxide</td>
<td>1305-78-8</td>
<td>OSHA PEL TWA</td>
<td>2 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>2 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>1333-86-4</td>
<td>ACGIH TLV TWA</td>
<td>3.5 mg/m³ (inhalable fraction)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL TWA</td>
<td>3.5 mg/m³ (0.1 in the presence of PAHs, as PAHs: 10-hr TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>3.5 mg/m³ (0.1 in the presence of PAHs, as PAHs: 10-hr TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFG MAK TWA</td>
<td>As inhalable dust</td>
</tr>
<tr>
<td>Kaolin</td>
<td>1332-58-7</td>
<td>ACGIH TLV TWA</td>
<td>2 mg/m³ respirable fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL TWA</td>
<td>15 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>10 mg/m³ total dust, 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Magnesium Carbonate</td>
<td>546-93-0</td>
<td>NE</td>
<td>NE</td>
</tr>
</tbody>
</table>

NE = Not Established. See Section 16 for Definitions of Terms Used.
8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

OCCUPATIONAL/WORKPLACE EXPOSURE LIMITS/GUIDELINES (continued):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>Guideline</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stoddard Solvent</td>
<td>8052-41-3</td>
<td>ACGIH TLV TWA</td>
<td>525 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL TWA</td>
<td>2900 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>350 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL STEL</td>
<td>1800 mg/m³ (15 min.)</td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>ACGIH TLV TWA</td>
<td>0.025 mg/m³ Respirable Fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL TWA</td>
<td>30 mg/m³ / % SiO₂ + 2 Total Dust; 10 mg/m³ / % SiO₂ + 2 Respirable Fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL TWA</td>
<td>0.05 mg/m³ Respirable Duct</td>
</tr>
</tbody>
</table>


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 aerosols from this product are created during use, use appropriate respiratory protection. If necessary, use only respiratory protection authorized in appropriate regulations. Oxygen levels below 15.5% 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.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Pasty.

MOLECULAR WEIGHT: Mixture.

ODOR: Solvent/hydrocarbon.

SPECIFIC GRAVITY: 1.25 ± 0.05

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

SOLUBILITY IN WATER: Negligible.

MELTING/FREEZING POINT: Not established.

PERCENT VOLATILE BY VOLUME: 4%

FLASH POINT: 40°C (104°F)

pH: Not established.

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.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable under normal circumstances of use and handling.

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.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion: Thermal decomposition of this product can generate dusts, irritating fumes, and toxic gases (e.g., carbon, calcium, nitrogen and sulfur oxides, various hydrocarbons). Hydrolysis: None known.

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

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure 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 ABSORPTION: The components of this product are not known to be absorbed through intact skin.

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.

INHALATION: Overexposure 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. Chronic inhalation of dusts from dried product may result in lung injury or damage. Contains suspect carcinogens by inhalation.
11. TOXICOLOGICAL INFORMATION (Continued)

**POTENTIAL HEALTH EFFECTS (continued):**

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

**TARGET ORGANS:** Acute: Skin, eyes, central nervous system. Chronic: Skin, respiratory system.

**CHRONIC EFFECTS:** Prolonged or repeated skin contact may cause dermatitis (dry, red skin).

**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.

**AMORPHOUS SILICON DIOXIDE:**

- **Standard Draize Test (Skin-Rabbit):** 25 mg/24 hours: mild
- **LC: (Inhalation-Rat) > 200 gm/m³/1 hour:** Lungs, Thorax, or Respiration: fibrosis, focal (pneumocellular)
- **LC: (Inhalation-Rat) 2190 mg/m³/4 hours:** Lungs, Thorax, or Respiration: dyspnea
- **TDLo (Inhalation-Rat) 30 mg/m³/6 hours:** Sense Organs and Special Senses (Eye): Vision; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 7 mg/m³/5 days:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TL(0) (Inhalation-Rat) 3.7 mg/m³/6 hours:** Lungs, Thorax, or Respiration: changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **LDLo (Oral-Rat) 90 mg/kg:** Nutritional and Gross Metabolic: other changes

**CALCIUM CARBONATE, SYNTHETIC:**

- **Standard Draize Test (Skin-Rabbit):** 500 mg/24 hours: Moderate
- **Standard Draize Test (Skin-Rabbit):** 750 µg/24 hours: Severe
- **Rat (Intratracheal):** 4.6 ± 0.8 mg/gm³/30 days: Intermittent: effect on inflammation or mediation of inflammation
- **Rat (Intratracheal):** 1.66 mg/m³/7 hours: Lungs, Thorax, or Respiration: spasm; Blood changes in leukocyte (WBC) count; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **Rat (Intratracheal) 50 mg/m³:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Oral-Rat) 60 mg/kg:** Gastrointestinal: hypermotility, diarrhea, other changes
- **TDLo (Oral-Rat) 10 mg/kg:** Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

**CALCIUM OXIDE:**

- **LDLo (Intratracheal-Hamster) 3059 mg/kg**

**CARBON BLACK (continued):**

- **LDLo (Oral-Rat) > 15.400 mg/kg:** Behavioral: somnolence (general depressed activity)
- **LDLo (Skin-Rabbit) > 3 gm/kg**

**CARBON BLACK**

- **TDLo (Inhalation-Rat) 7 mg/m³:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 1.66 mg/m³/7 hours:** Lungs, Thorax, or Respiration: spasm; Blood changes in leukocyte (WBC) count; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 50 mg/m³:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 28 mg/m³/6 hours:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 50 mg/m³/6 hours:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration - other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 7 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Rat) 11.600 µg/m³/18 hours/2 years:** Tumorigenic: carcinogenic by KTECS criteria; Lungs, Thorax, or Respiration: tumors
- **TDLo (Inhalation-Mouse) 50 mg/m³/6 hours:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified
- **TDLo (Inhalation-Mouse) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 1 mg/m³/13 weeks:** Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 7 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 50 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 50 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 50 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 50 mg/m³/6 hours/13 weeks:** Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
- **TDLo (Inhalation-Hamster) 10 mg/m³/6 weeks:** Blood: pigmented or nucleated red blood cells. Liver: changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain
- **TDLo (Intravenous-Rat) 10 mg/kg/2 minutes:** Biochemical: Enzyme inhibition, induction, or changes in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)
11. TOXICOLOGICAL INFORMATION (Continued)

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.

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>EPA</th>
<th>IARC</th>
<th>NTP</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>PROP 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amorphous Silicon Dioxide</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Calcium Carbonate, Synthetic</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Calcium Oxide</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>No</td>
<td>2B</td>
<td>No</td>
<td>Ca</td>
<td>A3</td>
<td>No</td>
<td>Yes (airborne, unbound particles of respirable size)</td>
</tr>
<tr>
<td>Kaolin</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>A4</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Magnesium Carbonate</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Quartz</td>
<td>No</td>
<td>1</td>
<td>K</td>
<td>Ca</td>
<td>A2</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Stoddard Solvent</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>


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: No component of this product is known to cause human sensitization effects.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: None known.

REPRODUCTIVE TOXICITY INFORMATION: This product has not been tested for reproductive toxicity. Information on components is given below.

Mutagenicity: Positive results for Carbon Black have been obtained in somatic cells following live animal inhalation exposures.

BIOLOGICAL EXPOSURES INDICES (BEIs): There are no BEI’s established for any component of this product at this time.

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.

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.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: As supplied, this product would be a hazardous waste as defined by U.S. federal regulation (40 CFR 261) if discarded or disposed. It has the characteristic of Ignitibility. 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: D001.

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: 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 (2012): 128

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: 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
14. TRANSPORTATION INFORMATION (Continued)

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
SPECIAL PROVISIONS: A3
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

ADDITIONAL 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.
U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: No; 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): Not applicable.
U.S. CLEAN AIR ACT (CA 112r) THRESHOLD QUANTITY (TQ): Not applicable.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Quartz component is on the California Proposition 65 lists. WARNING: This product contains a chemical known to the State of California to cause cancer. Carbon Black (airborne, unbound particles of respirable size) is found on the Proposition 65 List of chemicals known to the state to cause cancer. Due to the form of the product, the Proposition 65 warning is not applicable to the Carbon Black in this product.

ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LIST: No component of this product is on the CEPA Priorities Substances Lists.
CANADIAN WHMIS REGULATIONS: This product is classified as a Controlled Product, Hazard Class B3 (Combustible Liquid), D2B (Immediate Acute Toxicity/Irritation, Limited Evidence of Carcinogenic and Mutagenic Effect) as per the Controlled Product Regulations.

ADDITIONAL MEXICAN REGULATIONS:
MEXICAN WORKPLACE REGULATIONS (NOM-018-STPS-2000): This product is not classified as hazardous.

16. OTHER INFORMATION

WARNINGS (per ANSI Z129.1): WARNING! COMBUSTIBLE. MAY CAUSE EYE, SKIN, AND RESPIRATORY TRACT IRRITATION, ESPECIALLY IF EXPOSURE IS PROLONGED. MAY BE HARMFUL BY INGESTION OR INHALATION. CONTAINS SUSPECT CARCINOGENS. 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.
16. OTHER INFORMATION (Continued)

WARNINGS (continued): 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 CO₂. IN CASE OF SPILL: Absorb spilled product with polyponds 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 the Global Harmonization Standard.

Classification: Carcinogenic Category 1B, Mutagenic Category 1B, Combustible Liquid Category 4, Acute Oral Toxicity Category 5, Eye Irritation Category 2B, Skin Irritation Category 2

Signs/Word: Danger


Precautionary Statements:

Prevention: 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. P264: Wash thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response: P308 + P331: IF exposed or concerned: Get medical advice/attention. P370 + P378: In case of fire: Use materials appropriate for surrounding fire for extinction. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P332 + P313: If skin irritation occurs, get medical attention. P362 + P364: Take off contaminated clothing and wash it before reuse. 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. 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). Refer to other portions of precautionary text on this label, SDS or other product information sheets, as appropriate.


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

Hazard Symbols/Pictogram: GHS07, GHS08

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 use 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: October 2012: Up-date and revise entire MSDS to include current GHS requirements.

DATE OF PRINTING: April 8, 2015

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 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.

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 mutants. 4: Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action, e.g. p-aminobenzonitrile, 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: 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-creating or permanent injury.

LOQ: Limit of Quantitation.

KEY ACRONYMS (continued):

NC: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIOSH: National Institute of Occupational Safety and Health.

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-hour TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

TWA: Time Weighted Average exposure concentration for a conventional 8-hr (TWA, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEEL: Workplace Environmental Exposure Limits from the AIHA.

HAZARD RATINGS:

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 LD₅₀ Rat: > 8000 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: > 2000 mg/kg. Inhalation Toxicity 4-hr LC₅₀ Rat: > 20 mg/L.
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD: (continued) 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. E.I.: Slightly or mildly irritating. No Rating: Oxidizers: Packaging Group I and II.

2 Moderate Hazard: Temporary or transitory injury may occur; prolonged exposure may affect the central nervous system (CNS), respiratory system, liver, kidney, skin, bone, or teeth. Skin Irritation: Moderately severe to severely irritating; reversible; corrosive. Prolonged or repeated exposure may cause severe skin irritation. Evidence of respiratory irritation: May irritate the respiratory tract and produce coughing and other local effects.

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 death. Evidence of respiratory irritation: May cause severe irritation to the respiratory tract, and produce coughing and other local effects.

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, as no fluid can be used that will represent a living state.

6 FLAMMABILITY HAZARD: Minimal Hazard: Materials that will not burn in air when exposed to a temperature of 815.1°C (1500°F) for a period of 5 minutes. 7 Slight Hazard: Materials that must be preheated before ignition can occur. Material requires considerable preheating, under all ambient temperature conditions. 8 Moderate Hazard: Materials that have a fire hazard a degree of hazard 3. Dusts and mists with an LC50 greater than 40 mg/kg but less than or equal to 100 mg/kg. Materials that, under emergency conditions, can cause significant damage to human health. 9 Severe Hazard: Materials that have a fire hazard a degree of hazard 4. Dusts and mists with an LC50 greater than 10 mg/kg. Materials that, under emergency conditions, can cause significant irreversible injury to human health.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD: (continued) 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: ≥ 517.4 psi absolute at 70°F (41°C). No Rating: Oxidizers: Packaging Group I and II.

Oxidizers: Materials that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, or 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. Water Reactivity: Materials that may react explosively with water. Organic Peroxides: Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressure. Explosives: Division 1.1 & 1.2 explosives. Explosive substances that do not meet the criteria for Division 1.3 explosives. Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, or have a low potential (or high risk) to cause significant heat generation or explosion. Pyrophorics: Add to the definition of Flammability 4. Oxidizers: No 4 rating. Unstable Substances: Materials that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, or have a low potential (or high risk) to cause significant heat generation or explosion.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS

HEALTH HAZARD: Materials that, under emergency conditions, would offer no hazard beyond that presented by materials that do not have an LC50 for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC50 for acute inhalation toxicity greater than 200 mg/L. Materials with an LD50 for oral toxicity greater than 2000 mg/kg. Materials with an LD50 for acute oral toxicity greater than 200 mg/kg. Materials essentially non-irritating to the skin, eye, or mucous membranes. Materials essentially non-corrosive to the skin, eye, and mucous membranes. Materials that do not polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, or have a low potential (or high risk) to cause significant heat generation or explosion.

EPA (current edition).

Disclaimer: While every effort has been made to ensure the accuracy of the information provided, neither the authors nor the publishers of this work accept responsibility for any errors, omissions, or consequences arising from the use of such information.
DEFINITIONS OF TERMS (Continued):

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): I. 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. J. 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. K. 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 100 W/mL. L. 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. M. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. N. 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.

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. LDo: Lethal Dose (solids & liquids) that kills 50% of the exposed animals. LC50: Lethal Concentration (gases) that kills 50% of the exposed animals. Conc. Concentration expressed in parts of material per million parts of air or water. 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. TDx: TDLo, and TCLo or TC, TCLo, and TCLo: 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. IARCa 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 TOXICITY INFORMATION: A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxicin 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:

FC: 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. LCo or LCo1: Coefficient of Old/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 DOP, 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: