SAFETY DATA SHEET

Urexpan NR-200 Part A Activator

PART I  What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

IDENTIFICATION of the SUBSTANCE or PREPARATION

<table>
<thead>
<tr>
<th>TRADE NAME (AS LABELED):</th>
<th>Urexpan NR-200 Part A Activator</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT DESCRIPTION:</td>
<td>Urethane Activator</td>
</tr>
<tr>
<td>CHEMICAL NAME/CLASS:</td>
<td>Isocyanate in Polyether Triol</td>
</tr>
<tr>
<td>SYNONYMS:</td>
<td>TT00132</td>
</tr>
<tr>
<td>RELEVANT USE:</td>
<td>Self-Leveling Traffic-Grade Polyurethane 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>
<tr>
<td>PREPARATION DATE:</td>
<td>January 2004</td>
</tr>
<tr>
<td>REVISION DATE:</td>
<td>August 17, 2014</td>
</tr>
</tbody>
</table>

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. 2, Acute Inhalation Toxicity Cat. 3, Eye Irritation Cat. 2, STOT (Inhalation-Respiratory Irritation) SE Cat. 3, Skin Irritation Cat. 2, Respiratory Sensitizer Cat. 1, Skin Sensitization Cat. 1, Aquatic Chronic Toxicity Cat. 3

Signal Word: Danger

Hazard Statement Codes: H351, H331, H319, H335, H334, H317, H412


Hazard Symbols/Pictograms: GHS06, GHS08

EMERGENCY OVERVIEW:

Physical Description: This product is a clear, light yellow liquid with an odor characteristic of isocyanates.

Health Hazards: DANGER! Inhalation of vapors may be harmful or fatal. Harmful or fatal if swallowed. This compound can cause irritation by all routes of exposure. Eye irritation may be severe. Chronic inhalation may cause lung damage. May cause toxic systemic effects by skin absorption. Can cause skin and respiratory sensitization and allergic reaction. Contain compounds that are suspect carcinogens.

Reactivity Hazard: This product is combustible and can ignite if exposed to high temperature or direct flame.

Environmental Hazard: This product has not been tested for environmental impact. All release to the environment should be avoided. Contains compounds that can cause harm to aquatic organisms.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®)

<table>
<thead>
<tr>
<th>Health</th>
<th>3*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>1</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>2</td>
</tr>
</tbody>
</table>

See Section 16 for definitions of ratings

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

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

CANADIAN WHMIS CLASSIFICATION: Class D1A, Class D2A, 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. COMPOSITION AND INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>W/W%</th>
<th>LABEL ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30.0-60.0</td>
<td>Classification: Not Applicable</td>
</tr>
<tr>
<td>Proprietary Polyol</td>
<td>25051-96-2</td>
<td>15.0-30.0</td>
<td>Hazard Statement Codes: Not Applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.0-20.0</td>
<td>Classification: Carcinogenic Cat. 2, Acute Inhalation Toxicity Cat. 2, Eye Irritation Cat. 2, STOT (Inhalation-Respiratory Irritation) SE Cat. 3, Skin Irritation Cat. 2, Respiratory Sensitizer Cat. 1, Skin Sensitization Cat. 1, Aquatic Chronic Toxicity Cat. 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hazard Statement Codes: H351, H330, H319, H335, H334, H317, H412</td>
</tr>
<tr>
<td>Disononyl Phthalate</td>
<td>6815-43-5</td>
<td>1.0-15.0</td>
<td>Classification: Not Applicable</td>
</tr>
<tr>
<td>Diisethyl Phthalate</td>
<td>68648-93-1</td>
<td>0.0-10.0</td>
<td>Classification: Not Applicable</td>
</tr>
<tr>
<td>Other proprietary and 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).</td>
<td></td>
<td></td>
<td>Balance</td>
</tr>
</tbody>
</table>

See Section 16 for full text of Ingredient Hazard and Precautionary Statements

PART II What should I do if a hazardous situation occurs?

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. Fire protective gear may be 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 mists, sprays or fumes of this material 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 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: Acute or chronic respiratory conditions, skin and respiratory allergies and asthma may be aggravated by overexposure to this product.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate overexposure. Be observant for pulmonary edema. Copiously irrigate contaminated skin and eyes with saline. Non-cardiogenic pulmonary edema and bronchospasm are the most immediate serious clinical consequences of isocyanate exposure. Markedly symptomatic patients should receive oxygen, ventilatory support, and an intravenous line. Treatment for asthma includes inhaled sympathomimetics (salbutamol, metaproterenol), intravenous theophylline, parenteral sympathomimetics (epinephrine, terbutaline), and steroids.

5. FIRE-FIGHTING MEASURES

FLASH POINT: 105°C (220°F)

AUTOIGNITION: Not determined.

FLAMMABLE LIMITS IN AIR: Not known for product.

EXTINGUISHING MEDIA:

Suitable Extinguishing Media: Use materials appropriate for surrounding materials. Water should be used for cooling of containers only due to reaction with water.

Unsuitable Extinguishing Media: Water and halogenated media.

PROTECTION OF FIREFIGHTERS:

Special Hazards Arising From the Product: This is a combustible liquid which is also toxic by inhalation and skin contact and so presents a contact hazard to fire-fighters. This compound reacts with water to form urea polymers, heat and carbon dioxide. Products of thermal decomposition are highly toxic (refer to Section 10 Stability and Reactivity). This reaction can be vigorous. Not sensitive to mechanical impact under normal conditions. Closed containers may develop pressure and rupture in event of fire or if contaminated with water and when exposed to the heat of a fire.
5. FIRE-FIGHTING MEASURES (Continued)

PROTECTION OF FIREFIGHTERS (continued):
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 may 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. Avoid contact with water.

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. Absorb spilled liquid with clay, sand, polypads, or other suitable inert absorbent materials. 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. Monitor area for combustible vapor levels and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, and that levels are below applicable LELs (see Section 5 – Fire Fighting Measures) before non-response personnel are allowed into the spill area. Purge equipment with inert gas prior to reuse.

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.

PART III How can I prevent hazardous situations from occurring?

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, vapors or mist. Do not taste or swallow. Use only with adequate ventilation. Wash hands after handling this product. Contaminated clothing needs to be laundered prior to reuse. 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: Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Containers should be separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Local Fire Departments should be notified of the storage of this product on site. Storage and processing areas of this product should be identified with a NFPA 704 placard (diamond) large enough to be seen from a distance. Post warning and “NO SMOKING” signs in storage and use areas, as appropriate. Refer to NFPA 30, Flammable and Combustible Liquids Code, for additional information on storage. Have appropriate extinguishing equipment in the storage area (such as sprinkler systems or portable fire extinguishers). Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Empty containers may contain residual product; therefore, empty containers should be handled with care. Store container below 27°C (80°F) to avoid possible reactions related to heat and overpressure of containers.

PRODUCT USE: This product is used as a urethane activator. 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.
8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

Occupational/Workplace Exposure Limits/Guidelines:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS#</th>
<th>Guideline</th>
<th>Value</th>
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<td>Diisomonyl Phthalate</td>
<td>68515-43-5</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Dialkyl Phthalate</td>
<td>68648-93-1</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Proprietary Polyisocyanate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGLH TLV TWA</td>
<td>0.05 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA PEL STEL</td>
<td>0.02 ppm (ceiling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH REL TWA</td>
<td>0.005 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH REL STEL</td>
<td>0.02 ppm (ceiling) 15 minutes</td>
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<tr>
<td>NIOSH IDLH</td>
<td>75 mg/m³</td>
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<tr>
<td>DFG MAK TWA</td>
<td>0.05 ppm (inhalable fraction)</td>
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<td></td>
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<tr>
<td>DFG MAK PEAK</td>
<td>18 MAK 15 minute average value, 1-hr interval, 4 per shift; 0.1 ppm (ceiling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proprietary Polyol</td>
<td></td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Polyether Triol</td>
<td>25791-96-2</td>
<td>NE</td>
<td>NE</td>
</tr>
</tbody>
</table>

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


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

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

Body Protection: Use body protection appropriate for task (e.g., lab coat, coveralls, Tyvek suit). Full-body chemical protection may be necessary. 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.

Respiratory Protection: If mists or sprays 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. The following NIOSH respiratory equipment guidelines for components that present an inhalation hazard are presented for additional assistance in respiratory protective equipment selection.

Proprietary Polyisocyanate

CONCENTRATION RESPIRATORY PROTECTION
Up to 0.5 mg/m³: Any Supplied-Air Respirator (SAR).
Up to 1.25 mg/m³: Any SAR operated in a continuous-flow mode.
Up to 2.5 mg/m³: Any Self-Contained Breathing Apparatus with a full facepiece, or any SAR with a full facepiece.
Up to 75 mg/m³: Any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is available for the product.

FORM: Viscous liquid.
MOLECULAR WEIGHT: Mixture.
ODOR: Characteristic of isocyanates.
SPECIFIC GRAVITY: 1.04
WATER SOLUBILITY: Reacts.

HOW TO DETECT THIS SUBSTANCE (WARNING PROPERTIES): The appearance and odor of this product may act as warning properties in the event of an accidental release.

The following information is available for the main Proprietary Polyol component.

MOLECULAR FORMULA: (C₉H₁₈O)nH₂O
ODOR: None.
VAPOR DENSITY: Not available.
POUR POINT: Not available.
SPECIFIC GRAVITY @ 20°C (water = 1): 0.95-1.02
SOLUBILITY IN WATER: 1-10 g/100 mL
VAPOR PRESSURE: Extremely low.
COEFFICIENT WATER/OIL DISTRIBUTION: Not available.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable under normal circumstances of use and handling. May become unstable if stabilizer becomes depleted. At high temperatures the disocyanate components of this product can form carbodiimides with the release of carbon dioxide, which can cause pressure build up in closed containers.
10. STABILITY and REACTIVITY (Continued)

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

INCOMPATIBLE MATERIALS: Based on components, this product may be incompatible with amines, water, strong bases, alcohols, copper alloys, zinc, tin and aluminum compounds.

HAZARDOUS DECOMPOSITION PRODUCTS: 
- Combustion: Thermal decomposition of this product can generate formaldehyde, carbon oxides, nitrogen oxides, hydrogen cyanide, isocyanates and isocyanic acid. 
- Hydrolysis: Carbon dioxide, heat and urea polymers.

POSSIBILITY OF HAZARDOUS REACTIONS: This product may undergo hazardous polymerization in contact with water or materials to which it is incompatible. The reaction may produce heat, carbon dioxide and urea polymers; reaction may be vigorous. Containers may rupture. Due to the high level of the Polyether Triol and Diol components, this product may form unstable or flammable peroxides on prolonged exposure to air if stabilizer is depleted.

PART IV Is there any other useful information about this material?

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: Depending on the duration of skin contact, skin overexposures can cause reddening, discomfort and moderate to severe irritation. Prolonged or further contact can cause severe inflammation, redness, rash, swelling and blistering. Repeated skin exposure to low concentration can cause dermatitis. Skin contact can cause allergic reaction. Brief contact with the liquid or vapors from this product and the eyes can cause irritation, reddening and watering. Direct eye contact may cause severe eye irritation.

Skin Absorption: Prolonged skin contact may cause adverse systemic toxicity by skin absorption as described under ingestion or inhalation, as well as sensitization and allergic reaction to the skin.

Ingestion: If the product is swallowed, it can irritate the mouth, throat, and other tissues of the gastro-intestinal system or cause burns and may cause nausea, vomiting, and diarrhea. Symptoms can include dizziness, vomiting and incoordination. Ingestion of large amounts may be harmful and cause systemic toxicity. Aspiration into the lungs after ingestion can pose a serious hazard of chemical and pulmonary edema. Ingestion may be fatal.

Inhalation: Inhalation of vapors, mists, or sprays of this product can moderately to severely irritate the tissues of the nose, mouth, throat, and upper respiratory system. Symptoms of overexposure may include coughing, sneezing, and difficulty breathing. Severe overexposure via inhalation may result in a potentially fatal respiratory disorder (e.g., pulmonary edema, chemical pneumonitis); symptoms may be delayed by hours or even days. Inhalation of high concentrations of this product (as may occur in a poorly ventilated area) may be fatal. Repeated inhalation of mists of this product may cause respiratory disorders (e.g., bronchitis). Inhalation can also lead to adverse central nervous system effects, including dizziness, incoordination, nausea and vomiting. Chronic inhalation of low concentration may cause permanent damage to the lungs and reduced lung function. Effects such as euphoria, muscle incoordination and loss of consciousness have been reported after severe exposure to toluene disocyanates. Inhalation can cause respiratory sensitization and allergic reaction as described further in this Section.

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

OTHER HEALTH EFFECTS: None known.

TARGET ORGANS: Acute: Skin, eyes, respiratory system. Chronic: Skin, respiratory system.

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology data are available for components greater than 1% in concentration.

Proprietary Polyisocyanate:
- Standard Draize Test (Skin-Rabbit) 500 mg/24 hours
- Standard Draize Test (Eyes-Rabbit) 100 mg: Moderate

TCLo (Inhalation-Human) 130 ppm/30 minutes; Immunological Including Allergic: increased immune response; Nutritional and Gross Metabolistic: body temperature increase.

LD₅₀ (Oral-Rat) 9200 mg/kg; Behavioral: somnolence (general depressed activity), ataxia.

Nutritional and Gross Metabolic: body temperature decrease.

LC₅₀ (Oral-Mouse) 2200 mg/kg

TCLo (Inhalation-Rat) 178 mg/m³

TCLo (Inhalation-Rat) 8 mg/m³/6 hours: Lungs, Thorax, or Respiration: changes in lung weight, other changes.

TCLo (Inhalation-Rat) 20 mg/m³/6 hours: Lungs, Thorax, or Respiration: other changes.

Biochemical: Metabolism (Intermediary): lipids including transport.

TCLo (Inhalation-Rat) 2.4 mg/m³/6 hours: Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi, other changes; Biochemical: Metabolism (Intermediary): other proteins.

TCLo (Inhalation-Rat) 0.7 mg/m³/6 hours: Behavioral: muscle contraction or spasticity; Sense Organs and Special Senses (Eye): changes in extra-ocular muscles, effect, not otherwise specified.

TCLo (Inhalation-Rat) 10 mg/m³/6 hours: Lungs, Thorax, or Respiration: other changes.

Biochemical: Metabolism (Intermediary): other proteins.

TCLo (Inhalation-Rat) 30 mg/m³/6 hours: Lungs, Thorax, or Respiration: other changes, changes in lung weight.

Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects.

TCLo (Inhalation-Rat) 150 mg/m³/6 weeks: Immunological Including Allergic: hypersensitivity delayed.

TCLo (Inhalation-Rat) 50 mg/m³/6 hours: female 6-15 days after conception: Reproductive: Maternal Effects: other effects; Specific Developmental Abnormalities: musculoskeletal system.

TDLo (Oral-Rat) 15.2 mg/m³/6 hours: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases, Metabolism (Intermediary): lipids including transport, Metabolism (Intermediary): other proteins.

TDLo (Oral-Rat) 50.6 mg/m³/6 hours: Lungs, Thorax, or Respiration: other changes, changes in lung weight.

TDLo (Skin-Mouse) 0.09 ppm/2 days: Blood: other changes; Skin and Appendages: cutaneous sensitization, experimental (after topical exposure): Biochemical: Metabolism (Intermediary): other proteins, effect on inflammation or mediation of inflammation.

TDLo (Skin-Mouse) 220 mg/kg/12 days: Skin and Appendages: cutaneous sensitization, experimental (after topical exposure): Immunological: Metabolism (Intermediary): other proteins, effect on inflammation or mediation of inflammation.

TDLo (Skin-Mouse) 2 ppm/2 weeks: Immunological: Including Allergic: increase in humoral immune response.

TDLo (Skin-Mouse) 2 ppm/4 weeks: Immunological: Including Allergic: increase in humoral immune response.

DNA Damage (Inhalation-Human) 20 ppm/15 minutes-continuous | Cyto genetic Analysis (Human Lymphocyte) 540 mg/L.

Cytogenetic Analysis (Human Lymphocyte) 0.64 mg/plate.

DNA Adduct (Inhalation-Rat) 2 mg/ml/52 weeks-continuous.

DNA Adduct (Inhalation-Rat) 0.002 mg/L/17 hours/1 year.

Micrococcus Test (Inhalation-Rat) 7.1 mg/ml/3 hours.

Mutation in Microorganisms (Bacteria-Salmonella typhimurium) 0.02 mg/plate.
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.

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<thead>
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<th>EPA</th>
<th>NTP</th>
<th>NIOSH</th>
<th>ACGIH</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Proprietary Polyol</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>Polyether Triol</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>Proprietary Polyisocyanate</td>
<td>3</td>
<td>CBD, D</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

EPA-CBD: Cannot Be Determined. EPA-D: Not Classifiable as to Human Carcinogenicity. EPA-II: Inadequate Information to Assess Carcinogenic Potential. IARC-2B: Possibly Carcinogenic to Humans. IARC-3: Possibly Carcinogenic to Humans. NTP-R: Reasonable Anticipated to Be a Human Carcinogen. NIOSH-Ca: Potential Occupational Carcinogen, with No Further Categorization. ACGIH TLV-Ar: Not Classifiable as a Human Carcinogen. MAK-4: Substances with Carcinogenic Potential for which genotoxicity plays no or at most a minor role. No contribution to human cancer risk is expected, provided the MAK value is observed.

**IRRITATION OF PRODUCT:** This product is irritating by all routes of exposure.

**SENSITIZATION TO THE PRODUCT:** This product contains diisocyanate compounds, which are known human skin and respiratory sensitizers. Exposure can cause allergic reactions. Cross-sensitization between different isocyanates may occur.

Respiratory Sensitization: Initial symptoms of respiratory reactions may appear to be a cold or mild hay fever. However, severe asthmatic symptoms can develop and include wheezing, chest tightness, shortness of breath, difficulty breathing and/or coughing. Fever, chills, general feelings of discomfort, headache, and fatigue can also occur. Symptoms may occur immediately upon exposure (within an hour), several hours after exposure or both, and/or at night. Typically, the asthma improves with removal from exposure (e.g. weekends or vacations) and returns, in some cases, in the form of an "acute attack", on renewed exposure. Sensitized people who continue to work with diisocyanates may develop symptoms sooner after each exposure. The number and severity of symptoms may increase. Death has occurred in sensitized individuals accidentally exposed to relatively low concentrations of some diisocyanates. Following removal from exposure, some sensitized workers may continue to show a slow decline in lung function and have persistent respiratory problems such as asthmatic symptoms, chronic bronchitis and hypersensitivity for months or years. Exposure to isocyanates is likely to aggravate existing respiratory disease, such as chronic bronchitis, and emphysema.

Skin Sensitization: Repeated skin contact with diisocyanates has caused skin sensitization in humans, although the condition is not common. Once a person is sensitized, contact with even a small amount can cause outbreaks of dermatitis with symptoms such as redness, rash, itching and swelling. This can spread from the hands or arms to the face and body. Some people who have inhaled some diisocyanates developed extensive skin rashes can last weeks.

**TOXICOLOGICAL SYNERGISTIC PRODUCTS:** None known.

**REPRODUCTIVE TOXICITY INFORMATION:** This product has not been tested for reproductive toxicity. No information is known about components.

**BIOLOGICAL EXPOSURES INDICES (BEIs):** Currently, there are no BEI’s established for components of this product.

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. A

**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 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.

14. TRANSPORTATION INFORMATION

**U.S. DEPARTMENT OF TRANSPORTATION:** This product is NOT classified as Dangerous Goods, per U.S. DOT regulations, under 49 CFR 172.101.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This product is NOT classified as Dangerous Goods, per regulations of Transport Canada.

**INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):** This product is NOT classified as dangerous goods, per the International Air Transport Association.

**INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO):** This product is not classified as dangerous goods, per the International Maritime Organization.
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 302 Extremely Hazardous Threshold Planning Quantity (TPQ): Not applicable.
U.S. SARA 304 Extremely Hazardous Reportable Quantity (RQ): Not applicable.
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): Although the Proprietary Polysiocyanate compound has no TQ, it is listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems under the Clean Air Act.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): No component is on the California Proposition 65 lists.

ADDITIONAL CANADIAN REGULATIONS:
Canadian DSL/NDSL Inventory Status: The components of this product are on the DSL Inventory.
Canadian Environmental Protection Act (CEPA) Priorities Substances Lists: Not applicable.
Canadian WHMIS: This product is classified as a Controlled Product, Hazard Classes, D1A/D2A (Poisonous and Infectious Material, Other Effects/Very Toxic: Inhalation Toxicity), D2B (Poisonous and Infectious Material, Other effects/Toxic: Potential Carcinogenicity, Skin Irritation) as per the Controlled Product Regulations.

ADDITIONAL MEXICAN REGULATIONS:
Mexican Workplace Regulations (NOM-018-STPS-2000): This product is classified as hazardous.

16. OTHER INFORMATION

U.S. ANSI STANDARD LABELING (Precautionary Statements): DANGER! COMBUSTIBLE LIQUID. TOXIC BY INHALATION. MAY CAUSE EYE, SKIN AND RESPIRATORY IRRITATION. CAN CAUSE SKIN AND RESPIRATORY SENSITIZATION AND ALLERGIC REACTION. CONTAINS COMPOUNDS THAT ARE SUSPECT CARCINOGENS. POSES ASPIRATION HAZARD IF SWALLOWED. Avoid contact with eyes, skin, and clothing. Avoid breathing mist, vapors or fume. 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 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 SYSTEM CLASSIFICATION:
Classification: Carcinogenicity Category 2, Acute Inhalation Toxicity Category 3, Eye Irritation Category 2, Specific Target Organ Toxicity (Inhalation-Respiratory Irritation) Single Exposure Category 3, Skin Irritation Category 2, Respiratory Sensitizer Category 1, Skin Sensitization Category 1, Aquatic Chronic Toxicity Category 3
Signal Word: Danger
Precautionary Statements:
Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations. Hazard Symbols/Pictograms: GH06, GH08
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 or 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: August 2012: Up-date and revise entire MSDS to include current GHS requirements. August 2014: Up-date based on formulation change.
DATE OF PRINTING: August 20, 2014.
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: Transportation Communication 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 day.

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 MAKs: Unless otherwise specified, all MAK values are to be considered as MAK values.

NIOSH: National Institute for Occupational Safety and Health.

NIOSH CEILING: The threshold concentration below which the substance may be present at any time during a workday.

NIOSH PELs: The current occupational exposure limit established by NIOSH. The limit is based on both inhalation and dermal exposure. The phrase, “Vacated 1989 PEL” indicates NIOSH’s formal recognition that the PEL is obsolete and should not be used for workplace exposure limits or TWA calculations.

DEFINITION OF TERMS

Hazardous Materials Identification System Hazard Ratings (continued):

FLAMMABILITY HAZARD: Materials that are moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this group are not readily ignited under normal room temperature conditions. Under high ambient temperatures or moderate heat release may vaporize in sufficient quantities to produce hazardous atmospheres with air. This usually includes the following: Liquids having a flash point at or below 100°F (38°C); Solids that are easily ignited but which do not generally 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 (viscous and slow flowing as asphalt) that readily give off flammable vapors. 3. Serious Hazard: Materials which may cause brief but severe injury, even when under emergency conditions, form hazardous atmospheres in air under almost all ambient temperatures, or, unaugmented by ambient temperature, are readily ignited under almost all conditions. This usually includes the following: Liquids having a flash point below 10°F (−12°C), or a boiling point at or above 38°F (10°C) and those liquids having a flash point at or above 22°F (7°C) and below 73°F (23°C) (i.e. OSHA Class IA and IC); Materials that on account of their physical form or content may form a gas cloud or dust cloud 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).

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°F (7°C) and a boiling point below 73°F (23°C) (i.e. OSHA Class IA) and Materials that ignite spontaneously when exposed to air at a temperature of 5.4°C (40°F) or below (pyrophoric).

PHYSICAL HAZARD: 0 Water Reactivity: Materials that do not react with water. Organic Peroxides: Materials that react explosively with water when exposed to water. Oxidizers: Materials that react with water to produce oxygen or a gas mixture containing a weight percent of oxygen. Explosives: Substances that are Non-Explosive. Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No or rating. Unstable Reactives: Substances that will not polymerize, decompose, condense, or self-react. Water Reactivity: Materials that react or decompose upon exposure to moisture. Oxidizers: Materials, but can be ignited by exposure to air under 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 are combustible mixtures (such as wetted hay) and do not have a mass explosion hazard. 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 1.5 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 that indicate a significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. Water Reactivity: Materials that may react violently with water. Organic Peroxides: Materials that may decompose, condense, or self-react, and under high temperatures and/or pressures that indicate a significant heat generation or explosion hazard. Pyrophoric: Materials that may 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 psi absolute at 27°C (79°F) (50 psig) or ≤ 15 psi at 45°C (113°F) (1 psi = 6900 N/m²). Substances that are Non-Explosive. Pyrophoric: Materials that may ignite spontaneously when exposed to air at a temperature of 5.4°C (40°F) or below (pyrophoric).

Hazards Ratings (continued):

Packing Group I 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 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 that indicate a significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. Water Reactivity: Materials that may react violently with water. Organic Peroxides: Materials that may decompose, condense, or self-react, and under high temperatures and/or pressures that indicate a significant heat generation or explosion hazard. Pyrophorics: Materials that may 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 psi absolute at 21°C (70°F) (50 psig) or ≤ 15 psi at 45°C (113°F) (1 psi = 6900 N/m²). Substances that are Non-Explosive. Pyrophoric: Materials that may ignite spontaneously when exposed to air at a temperature of 5.4°C (40°F) or below (pyrophoric).

Hazardous materials are those with high potential to cause significant heat generation or explosion.

Explosives: Materials that may react explosively with water when exposed to water. Oxidizers: Materials that react with water to produce oxygen or a gas mixture containing a weight percent of oxygen. Explosives: Substances that are Non-Explosive. Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No or rating. Unstable Reactives: Substances that will not polymerize, decompose, condense, or self-react. Water Reactivity: Materials that react or decompose upon exposure to moisture. Oxidizers: Materials, but can be ignited by exposure to air under 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 are combustible mixtures (such as wetted hay) and do not have a mass explosion hazard. Pyrophorics: No Rating. Oxidizers: Packaging Group III oxidizers. Solids: any material that, either in concentration tested, exhibits a mean burning time 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 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 that indicate a significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. Water Reactivity: Materials that may react violently with water. Organic Peroxides: Materials that may decompose, condense, or self-react, and under high temperatures and/or pressures that indicate a significant heat generation or explosion hazard. Pyrophoric: Materials that may 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 psi absolute at 21°C (70°F) (50 psig) or ≤ 15 psi at 45°C (113°F) (1 psi = 6900 N/m²). Substances that are Non-Explosive. Pyrophoric: Materials that may ignite spontaneously when exposed to air at a temperature of 5.4°C (40°F) or below (pyrophoric).

Hazardous materials are those with high potential to cause significant heat generation or explosion.
DEFINITIONS OF TERMS (Continued):

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 2 Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 3000 ppm but less than or equal to 5000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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 LC₅₀ for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LC₅₀ 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 (−67.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but temporary irritation to the eyes or are lacrhamyters. Materials that are primary skin irritants or sensizers. Materials whose LD₅₀ for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. 3 Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 1000 ppm but less than or equal to 3000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than its LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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 LC₅₀ for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD₅₀ 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. Cyrogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below −55°C (−67.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD₅₀ 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 cause death or fatal injuries. Gases with an LC₅₀ for acute inhalation toxicity less than or equal to 100 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ 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 accordance with Annex D of NFPA 704. 1 Materials that must be preheated before ignition can occur. Materials in this degree require, under all ambient conditions, a minimum ignition temperature such that the material is not combustible until after being heated to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets or combustible solids with a self-sustained combustion test temperature at 250°C (482°F) at or above 150°C (302°F). Materials that burn under normal conditions but can be ignited under special conditions. Materials that burn only under special conditions. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) greater than or equal to 1000 W/mL. 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 100 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. 3 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. Minimum 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. UEL: 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. LC₅₀: Lethal Dose (solids and liquids): Concentration of the compound in the air that is lethal to 50% of the exposed animals. LC₅₀: 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/m³: Concentration expressed in weight of substance per volume of air. mg/L: Quantity of material, by weight, administered to a test subject, based on their body weight in kg. LD₅₀: Lowest dose to cause a symptom. TCLₕ: Lowest concentration to cause a symptom. TDₕ, LDₕ, and Lₕ, or TCL, Tₕ, LCₕ, and LCₕ: Lowest dose (or concentration) to cause lethal or toxic effects. Cancer Information: IARC: International Agency for Research on Cancer. NTP: National Toxicology Program. REES: 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. Subbrackets (2A, 2B, etc.) are also used. Other Information: BEI: ACGIH Biological Exposure Indices, represent the levels of contaminants which are most likely to be observed in the workplace. Samples 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 teratogen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryo-toxogen 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 chemical will concentrate in aquatic life forms that consume contaminated plant or animal. TLE: Median threshold limit. log EC₅₀ or log LC₅₀: 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 a product’s package label.

Canada: