


## 1. PRODUCT & COMPANY IDENTIFICATION

|     |                        |   |
|-----|------------------------|---|
| 1.1 | Product Name:          | <b>PENTOFROST A1</b>  |
| 1.2 | Chemical Name:         | Ethylene Glycol Mixture   |
| 1.3 | Synonyms:              | Ethanediol  |
| 1.4 | Trade Names:           | Pentofrost A1   |
| 1.5 | Product Use:           | Engine Coolant  |
| 1.6 | Distributor's Name:    | <b>Worldpac, Inc.</b>   |
| 1.7 | Distributor's Address: | 37137 Hickory Street, Newark, CA 94560 USA                              |
| 1.8 | Emergency Phone:       | <b>INFOTRAC: +1 (800) 535-5053 / +1 (352) 323-3500 (CONTRACT 84261)</b> |
| 1.9 | Business Phone / Fax:  | +1 (510) 608-5525 / +1 (510) 742-9262                                   |

## 2. HAZARDS IDENTIFICATION

|     |                           |  |   |
|-----|---------------------------|--|---|
| 2.1 | Hazard Identification:    | This product is classified as a hazardous substance but not as dangerous goods according to the classification criteria of [NOHSC: 1088 (2004)] and ADG Code (Australia).<br><b>WARNING! HARMFUL IF SWALLOWED.</b><br><u>Hazard Statements (H):</u> H302 – Harmful if swallowed.<br><u>Precautionary Statements (P):</u> P264 – Wash hands and exposed skin areas with soap and warm water thoroughly after handling. P270 – Do not eat, drink or smoke when using this product. P280 – Wear protective gloves/eye protection. P301+P312 – IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P330 – Rinse mouth. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P501 - Dispose of contents/container to licenses treatment, storage and disposal facility (TSDF).                                  |  |
| 2.2 | Effects of Exposure:      | <p><u>Eyes:</u> This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists.</p> <p><u>Skin:</u> May cause mild skin irritation. Although rare, skin contact with ethylene glycol may cause an allergic skin reaction (e.g., delayed skin rash which may be followed by blistering, scaling and other skin effects). Passage through the skin may add to toxic effects from breathing or swallowing.</p> <p><u>Ingestion:</u> If small amounts swallowed, no significant adverse health effects are anticipated. However, ingestion of large amounts may cause serious damage to the target organs or death.</p> <p><u>Inhalation:</u> Breathing of vapor or mist is possible and may cause respiratory tract irritation. Possible adverse effects on the nervous system and blood-forming system. Aspiration of liquid into the lungs can cause severe lung damage or death.</p> |   |
| 2.3 | Symptoms of Overexposure: | <p><u>Eyes:</u> Stinging or burning sensation, Irritation, redness, and watering.</p> <p><u>Skin:</u> Possible irritation, defatting, or dermatitis (rash), characterized by dry, scaling, red, itching skin.</p> <p><u>Ingestion:</u> Laxative effects. Gastrointestinal discomfort, nausea, vomiting and headache.</p> <p><u>Inhalation:</u> Upper respiratory irritation, coughing, sneezing, staggering gait, giddiness, drowsiness, slurred speech, involuntary eye movement, kidney damage, weakness, fatigue, nausea, and possible nervous system depression. Overexposure to sprays or mists may cause chemical pneumonitis.</p>   |   |
| 2.4 | Acute Health Effects:     | Moderate irritation to eyes. Possible irritation to skin near affected areas or dermatitis (rash). Upper respiratory irritation, possible nervous system depression. Harmful or fatal if swallowed.  |   |
| 2.5 | Chronic Health Effects:   | Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis). Repeated or prolonged exposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals, and may aggravate pre-existing disorders of the organs in humans: kidneys, liver. May cause central nervous system effects, liver abnormalities, kidney damage or liver damage.   |   |
| 2.6 | Target Organs:            | Kidneys, liver, central nervous system.  |   |

## 3. COMPOSITION & INGREDIENT INFORMATION


| CHEMICAL NAME(S)  | CAS No.              | RTECS No. | EINECS No. | %      | EXPOSURE LIMITS IN AIR (mg/m <sup>3</sup> ) |      |        |         |         |      |      |      |  | OTHER |
|-------------------|----------------------|-----------|------------|--------|---|------|--------|---------|---------|------|------|------|--|-------|
|                   |                      |           |            |        | ACGIH                                       |      | NOHSC  |         |         | OSHA |      |      |  |       |
|                   |                      |           |            |        | ppm   |      | ppm    |         |         | ppm  |      |      |  |       |
|                   |                      |           |            |        | TLV   | STEL | ES-TWA | ES-STEL | ES-PEAK | PEL  | STEL | IDLH |  |       |
| ETHYLENE GLYCOL   | 107-21-1             | KW2975000 | 203-473-3  | 60-100 | (100)                                       | NA   | NF     | NF      | NF      | (50) | NA   | NA   |  |       |
|                   | Acute Tox. 4 *; H302 |           |            |        |   |      |        |         |         |      |      |      |  |       |
| DIETHYLENE GLYCOL | 111-46-6             | NA        | 203-872-2  | 7-13   | NA  | NA   | NF     | NF      | NF      | NA   | NA   | NA   |  |       |
|                   | Acute Tox. 4; H302   |           |            |        |   |      |        |         |         |      |      |      |  |       |

NA = Not Available; ND = Not Determined; NE = Not Established; NF = Not Found; C = Ceiling Limit; See Section 16 for Additional Definitions of Terms Used  
 NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-2010 format.

## 4. FIRST AID MEASURES

|                             |  |   |               |          |                     |          |                         |          |                             |  |             |             |
|-----------------------------|--|---|---------------|----------|---------------------|----------|-------------------------|----------|-----------------------------|--|-------------|-------------|
| 4.1                         | First Aid:                                 | <p><b>Ingestion:</b> DO NOT INDUCE VOMITING. Contact Infotrac +1 (800) 535-5053 or the nearest Poison Control Center or local emergency telephone number for assistance and instructions. Seek immediate medical attention. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration.</p> <p><b>Eyes:</b> If product gets in the eyes, flush eyes thoroughly with copious amounts of water for at least 15 minutes, holding eyelid(s) open to ensure complete flushing. If the eyes or face become swollen during or following use, consult a physician or emergency room immediately.</p> <p><b>Skin:</b> Remove contaminated clothing and wash affected areas with soap and water. If discomfort persists and/or the skin reaction worsens, contact a physician immediately. Do not wear contaminated clothing until after it has been properly cleaned.</p> <p><b>Inhalation:</b> Remove victim to fresh air at once. Under extreme conditions, if breathing stops, perform artificial respiration. Seek immediate medical attention.</p> |               |          |                     |          |                         |          |                             |  |             |             |
| 4.2                         | Medical Conditions Aggravated by Exposure: | <p>Persons with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="background-color: #0000FF; color: white; text-align: center;"><b>HEALTH</b></td> <td style="text-align: center;"><b>1</b></td> </tr> <tr> <td style="background-color: #FF0000; color: white; text-align: center;"><b>FLAMMABILITY</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td style="background-color: #FFA500; text-align: center;"><b>PHYSICAL HAZARDS</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>PROTECTIVE EQUIPMENT</b></td> </tr> <tr> <td style="text-align: center;"><b>EYES</b></td> <td style="text-align: center;"><b>SKIN</b></td> </tr> </table>   | <b>HEALTH</b> | <b>1</b> | <b>FLAMMABILITY</b> | <b>0</b> | <b>PHYSICAL HAZARDS</b> | <b>0</b> | <b>PROTECTIVE EQUIPMENT</b> |  | <b>EYES</b> | <b>SKIN</b> |
| <b>HEALTH</b>               | <b>1</b>                                   |   |               |          |                     |          |                         |          |                             |  |             |             |
| <b>FLAMMABILITY</b>         | <b>0</b>                                   |   |               |          |                     |          |                         |          |                             |  |             |             |
| <b>PHYSICAL HAZARDS</b>     | <b>0</b>                                   |   |               |          |                     |          |                         |          |                             |  |             |             |
| <b>PROTECTIVE EQUIPMENT</b> |  |   |               |          |                     |          |                         |          |                             |  |             |             |
| <b>EYES</b>                 | <b>SKIN</b>                                |   |               |          |                     |          |                         |          |                             |  |             |             |

## 5. FIREFIGHTING MEASURES

|     |                           |  |  |
|-----|---------------------------|--|--|
| 5.1 | Fire & Explosion Hazards: | If involved in a fire, this product may decompose at high temperatures to form toxic gases (e.g., CO, CO <sub>2</sub> , and NO <sub>x</sub> ), smoke, hydrocarbons and their derivatives.  |  |
| 5.2 | Extinguishing Methods:    | Water, Foam, CO <sub>2</sub> , Dry Chemical, low velocity water fog, Halon (if permitted),   |  |
| 5.3 | Firefighting Procedures:  | As with any fire, firefighters should wear appropriate protective equipment including a MSHA/NIOSH approved or equivalent self-contained breathing apparatus (SCBA) and protective clothing. Treat as hot oil. Hazardous decomposition products may be released. Thermal degradation may produce oxides of carbon, and/or nitrogen, hydrocarbons and/or derivatives. Fire should be fought from a safe distance. Keep containers cool until well after the fire is out. Use water spray to cool fire-exposed surfaces and to protect personal. Fight fire upwind. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway. |  |



## 6. ACCIDENTAL RELEASE MEASURES

|     |         |   |
|-----|---------|---|
| 6.1 | Spills: | <p>Before cleaning any spill or leak, individuals involved in spill cleanup must wear appropriate Personal Protective Equipment (PPE). Use safety glasses or safety goggles and face shield; use gloves and other protective clothing (e.g., apron, boots, etc.) to prevent skin contact.</p> <p><b>Small Spills:</b> Wear appropriate protective equipment including gloves and protective eyewear. Use a non-combustible, inert material such as vermiculite or sand to soak up the product and place into a container for later disposal.</p> <p><b>Large Spills:</b> Keep incompatible materials (e.g., oxidizers, strong acids, alkalis) away from spill. Stay upwind and away from spill or release. Isolate immediate hazard area and keep unauthorized personnel out of area. Stop spill or release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant. Recover as much free liquid as possible and collect in acid-resistant container. Use absorbent to pick up residue. Avoid discharging liquid directly into a sewer or surface waters.</p> |
|-----|---------|---|

## 7. HANDLING & STORAGE INFORMATION

|     |                           |  |
|-----|---------------------------|--|
| 7.1 | Work & Hygiene Practices: | Avoid breathing mists or spray. Avoid eye and skin contact. Wear protective equipment when handling product. Keep out of the reach of children. Do not eat, drink or smoke when handling this product. Wash thoroughly after handling. Do not expose to heat and flame. Use only in ventilated areas. Immediately clean-up and decontaminate any spills or residues.   |
| 7.2 | Storage & Handling:       | Use and store in a cool, dry, well-ventilated location (e.g., local exhaust ventilation, fans) away from heat and direct sunlight. Store in closed containers. Avoid temperatures above 40°C (120°F). Keep away from incompatible substances (see Section 10) and food/drink. Protect containers from physical damage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. |
| 7.3 | Special Precautions:      | Empty containers may retain hazardous product residues.  |

## 8. EXPOSURE CONTROLS & PERSONAL PROTECTION

|     |                                     |   |   |
|-----|-------------------------------------|---|---|
| 8.1 | Ventilation & Engineering Controls: | Use local or general exhaust ventilation to effectively remove and prevent buildup of vapors or mist generated from the handling of this product. Ensure appropriate decontamination equipment is available (e.g., sink, safety shower, eye-wash station).  |   |
| 8.2 | Respiratory Protection:             | No special respiratory protection is required under typical circumstances of use or handling. In instances where vapors or sprays of this product are generated, and respiratory protection is needed, use only protection authorized by 29 CFR §1910.134, applicable U.S. State regulations, or the Canadian CAS Standard Z94.4-93 and applicable standards of Canadian Provinces, EC member States, or Australia. |   |
| 8.3 | Eye Protection:                     | Avoid eye contact. Safety glasses with side shields must be used when handling or using this product. A protective face shield is also recommended. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).  |  |
| 8.4 | Hand Protection:                    | Wear protective, chemical-resistant gloves (e.g., neoprene, nitrile) when using or handling this product. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product.   |  |
| 8.5 | Body Protection:                    | Not required under normal conditions of use. A chemical resistant apron and/or protective clothing are recommended when handling or using large quantities (e.g., > 5 gallons (18.9 L)) of this product. Protective working garments should meet EU Standard EN 344 or equivalent.  |   |

## 9. PHYSICAL & CHEMICAL PROPERTIES

|      |   |  |
|------|---|--|
| 9.1  | Appearance:                                   | Red liquid                             |
| 9.2  | Odor:   | Mild glycol odor                       |
| 9.3  | Odor Threshold:                               | NA                                     |
| 9.4  | pH:   | NA                                     |
| 9.5  | Melting Point/Freezing Point:                 | NA                                     |
| 9.6  | Initial Boiling Point/Boiling Range:          | > 150 °C (> 302 °F)                    |
| 9.7  | Flashpoint:                                   | 126 °C (259 °F)                        |
| 9.8  | Upper/Lower Flammability Limits:              | LEL: 3.2%, UEL: 53.0%                  |
| 9.9  | Vapor Pressure:                               | 1.10 mm Hg @ 20 °C (68 °F)             |
| 9.10 | Vapor Density:                                | NA                                     |
| 9.11 | Relative Density:                             | 1.13 g/cm <sup>3</sup> @ 20 °C (68 °F) |
| 9.12 | Solubility:                                   | Soluble                                |
| 9.13 | Partition Coefficient (log P <sub>ow</sub> ): | NA                                     |
| 9.14 | Autoignition Temperature:                     | NA                                     |
| 9.15 | Decomposition Temperature:                    | NA                                     |
| 9.16 | Viscosity:                                    | NA                                     |
| 9.17 | Other Information:                            | NA                                     |

## 10. STABILITY & REACTIVITY

|      |                                   |  |
|------|-----------------------------------|--|
| 10.1 | Stability:                        | This product is stable under normal storage and use conditions.                                      |
| 10.2 | Hazardous Decomposition Products: | Oxides of carbon (CO, CO <sub>2</sub> ), sulfur (SO <sub>x</sub> ), and nitrogen (NO <sub>x</sub> ). |
| 10.3 | Hazardous Polymerization:         | Will not occur.  |
| 10.4 | Conditions to Avoid:              | Open flames, high heat and direct sunlight.  |
| 10.5 | Incompatible Substances:          | Strong oxidizing agents, acids or alkalis.   |

## 11. TOXICOLOGICAL INFORMATION

|      |                       |   |                 |                |
|------|-----------------------|---|-----------------|----------------|
| 11.1 | Routes of Entry:      | Inhalation: NO  | Absorption: YES | Ingestion: YES |
| 11.2 | Toxicity Data:        | This product has not been tested on animals to obtain toxicological data. Toxicology data for some of the components in this mixture, found in scientific literature, are presented below:<br>Ethylene Glycol: LD <sub>50</sub> (oral, rat): 5840 mg/kg; Diethylene Glycol: LD <sub>50</sub> (oral, rat): 12565 ppm |                 |                |
| 11.3 | Acute Toxicity:       | See section 2.4   |                 |                |
| 11.4 | Chronic Toxicity:     | See section 2.5   |                 |                |
| 11.5 | Suspected Carcinogen: | This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.  |                 |                |

Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 &amp; 1272/2008/EC Standards      SDS Revision: 2.0      SDS Revision Date: 12/31/2013

## 11. TOXICOLOGICAL INFORMATION – cont'd

|      |                              |   |
|------|------------------------------|---|
| 11.6 | Reproductive Toxicity:       | This product is not reported to cause reproductive toxicity in humans.  |
|      | Mutagenicity:                | This product is not reported to produce mutagenicity effects in humans. |
|      | Embryotoxicity:              | This product is not reported to produce embryotoxic effects in humans.  |
|      | Teratogenicity:              | This product is not reported to cause teratogenic effects in humans.    |
|      | Reproductive Toxicity:       | This product is not reported to cause reproductive effects in humans.   |
| 11.7 | Irritancy of Product:        | See Section 2.3   |
| 11.8 | Biological Exposure Indices: | NA  |
| 11.9 | Physician Recommendations:   | Treat symptomatically.  |

## 12. ECOLOGICAL INFORMATION

|      |                              |  |
|------|------------------------------|--|
| 12.1 | Environmental Stability:     | Do not allow product to reach ground water, water bodies or sewage system. |
| 12.2 | Effects on Plants & Animals: | There is no specific data available for this product.                      |
| 12.3 | Effects on Aquatic Life:     | There is no specific data available for this product.                      |

## 13. DISPOSAL CONSIDERATIONS



|      |                         |   |
|------|-------------------------|---|
| 13.1 | Waste Disposal:         | Dispose of in accordance with federal, state, provincial and local regulations.   |
| 13.2 | Special Considerations: | Used coolant may be recyclable. Contact the federal, state or provincial environmental authority to determine suitability for recycling and or proper disposal requirements. European Waste Catalogue: 16 01 14 |

## 14. TRANSPORTATION INFORMATION

The basic description (ID Number, proper shipping name, hazard class & division, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG, SCT, ADGT, ADR and the CTDGR.

|      |                      |               |
|------|----------------------|---------------|
| 14.1 | 49 CFR (GND):        | NOT REGULATED |
| 14.2 | IATA (AIR):          | NOT REGULATED |
| 14.3 | IMDG (OCN):          | NOT REGULATED |
| 14.4 | TDGR (Canadian GND): | NOT REGULATED |
| 14.5 | ADR/RID (EU):        | NOT REGULATED |
| 14.6 | SCT (MEXICO):        | NOT REGULATED |
| 14.7 | ADGR (AUS):          | NOT REGULATED |

## 15. REGULATORY INFORMATION

|      |                                   |   |
|------|-----------------------------------|---|
| 15.1 | SARA Reporting Requirements:      | This product contains <u>Ethylene Glycol</u> , a substance subject to SARA Title III, section 313 reporting requirements.   |
| 15.2 | SARA Threshold Planning Quantity: | NA  |
| 15.3 | TSCA Inventory Status:            | All components of this product are listed in the TSCA Inventory or are exempt.  |
| 15.4 | CERCLA Reportable Quantity (RQ):  | <u>Ethylene Glycol</u> : 5000 lbs (2270 kg)   |
| 15.5 | Other Federal Requirements:       | NA  |
| 15.6 | Other Canadian Regulations:       | This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List. WHMIS D2B (Other Toxic Effects).   |
| 15.7 | State Regulatory Information:     | <u>Ethylene Glycol</u> is found on the following state criteria lists: Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), Pennsylvania Right-to-Know List (PA), and Washington Permissible Exposures List (WA).<br><u>Diethylene Glycol</u> is found on the following state criteria lists: MN, PA.<br><u>Sodium Hydroxide</u> is found on the following state criteria lists: FL, MA, MN, NJ, PA, and WA.<br>No ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI). |
| 15.8 | Other Requirements:               | The primary component of this product is listed in Annex I of EU Directive 67/548/EEC:<br><u>Ethylene Glycol</u> : Harmful (Xn).<br><u>Risk Phrases</u> (R): R22 – Harmful if swallowed.<br><u>Safety Phrases</u> (S): S(2)-13-23-36-46 - Keep out of the reach of children. Keep away from food, drink and animal feeding stuffs. Do not breathe mists/vapours/spray. Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label where possible.   |

## 16. OTHER INFORMATION

|      |                      |  |  |
|------|----------------------|--|--|
| 16.1 | Other Information:   | <p><b>WARNING! HARMFUL IF SWALLOWED.</b> Wash hands and exposed skin areas with soap and warm water thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/eye protection. If ingested, call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p><b>KEEP OUT OF REACH OF CHILDREN.</b></p>   |  |
| 16.2 | Terms & Definitions: | See last page of this Safety Data Sheet.   |  |
| 16.3 | Disclaimer:          | <p>This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's &amp; Worldpac's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.</p> |  |
| 16.4 | Prepared for:        | <p><b>Worldpac, Inc.</b><br/>                 37137 Hickory Street<br/>                 Newark, CA 94560 USA<br/>                 Tel: +1 (510) 608-5525<br/>                 Fax: +1 (510) 742-9262<br/> <a href="http://www.worldpac.com">http://www.worldpac.com</a></p>  |  |
| 16.5 | Prepared by:         | <p><b>ShipMate, Inc.</b><br/>                 P.O. Box 787<br/>                 Sisters, OR 97759-0787 USA<br/>                 Tel: +1 (310) 370-3600<br/>                 Fax: +1 (310) 370-5700<br/> <a href="http://www.shipmate.com">http://www.shipmate.com</a></p>  |  |

## DEFINITION OF TERMS

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

### GENERAL INFORMATION:

|                |                                  |
|----------------|----------------------------------|
| <b>CAS No.</b> | Chemical Abstract Service Number |
|----------------|----------------------------------|

### EXPOSURE LIMITS IN AIR:

|              |   |
|--------------|---|
| <b>ACGIH</b> | American Conference on Governmental Industrial Hygienists |
| <b>TLV</b>   | Threshold Limit Value                                     |
| <b>OSHA</b>  | U.S. Occupational Safety and Health Administration        |
| <b>PEL</b>   | Permissible Exposure Limit                                |
| <b>IDLH</b>  | Immediately Dangerous to Life and Health                  |

### FIRST AID MEASURES:

|            |  |
|------------|--|
| <b>CPR</b> | Cardiopulmonary resuscitation - method in which a person whose heart has stopped receives manual chest compressions and breathing to circulate blood and provide oxygen to the body. |
|------------|--|

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

### HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

|   |                 |
|---|-----------------|
| 0 | Minimal Hazard  |
| 1 | Slight Hazard   |
| 2 | Moderate Hazard |
| 3 | Severe Hazard   |
| 4 | Extreme Hazard  |

|                            |
|----------------------------|
| <b>HEALTH</b>              |
| <b>FLAMMABILITY</b>        |
| <b>PHYSICAL HAZARDS</b>    |
| <b>PERSONAL PROTECTION</b> |

### PERSONAL PROTECTION RATINGS:

|          |  |
|----------|--|
| <b>A</b> |  |
| <b>B</b> |  |
| <b>C</b> |  |
| <b>D</b> |  |
| <b>E</b> |  |
| <b>F</b> |  |

|          |  |
|----------|--|
| <b>G</b> |  |
| <b>H</b> |  |
| <b>I</b> |  |
| <b>J</b> |  |
| <b>K</b> |  |
| <b>X</b> | Consult your supervisor or SOPs for special handling directions. |

|                      |                                   |                                  |                           |
|----------------------|-----------------------------------|----------------------------------|---------------------------|
| Safety Glasses       | Splash Goggles                    | Face Shield & Protective Eyewear | Gloves                    |
| Boots                | Synthetic Apron                   | Protective Clothing & Full Suit  | Dust Respirator           |
| Full Face Respirator | Dust & Vapor Half-Mask Respirator | Full Face Respirator             | Airline Hood/Mask or SCBA |

### OTHER STANDARD ABBREVIATIONS:

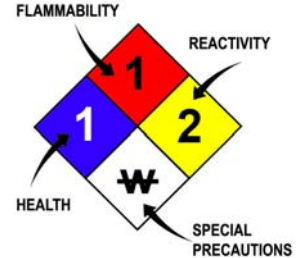
|             |                                    |
|-------------|------------------------------------|
| <b>NA</b>   | Not Available                      |
| <b>NR</b>   | No Results                         |
| <b>NE</b>   | Not Established                    |
| <b>ND</b>   | Not Determined                     |
| <b>ML</b>   | Maximum Limit                      |
| <b>SCBA</b> | Self-Contained Breathing Apparatus |

### NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

|                                    |   |
|------------------------------------|---|
| <b>FLAMMABILITY LIMITS IN AIR:</b> |   |
| <b>Autoignition Temperature</b>    | Minimum temperature required to initiate combustion in air with no other source of ignition   |
| <b>LEL</b>                         | Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source  |
| <b>UEL</b>                         | Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source |

### HAZARD RATINGS:

|                |                 |
|----------------|-----------------|
| <b>0</b>       | Minimal Hazard  |
| <b>1</b>       | Slight Hazard   |
| <b>2</b>       | Moderate Hazard |
| <b>3</b>       | Severe Hazard   |
| <b>4</b>       | Extreme Hazard  |
| <b>ACD</b>     | Acidic          |
| <b>ALK</b>     | Alkaline        |
| <b>COR</b>     | Corrosive       |
| <b>W</b>       | Use No Water    |
| <b>OX</b>      | Oxidizer        |
| <b>TREFOIL</b> | Radioactive     |



### TOXICOLOGICAL INFORMATION:

|   |   |
|---|---|
| <b>LD<sub>50</sub></b>  | Lethal Dose (solids & liquids) which kills 50% of the exposed animals |
| <b>LC<sub>50</sub></b>  | Lethal concentration (gases) which kills 50% of the exposed animal    |
| <b>ppm</b>  | Concentration expressed in parts of material per million parts        |
| <b>TD<sub>01</sub></b>  | Lowest dose to cause a symptom  |
| <b>TCLo</b>   | Lowest concentration to cause a symptom                               |
| <b>TD<sub>01</sub>, LD<sub>01</sub>, &amp; LD<sub>02</sub> or TC, TC<sub>01</sub>, LC<sub>01</sub>, &amp; LC<sub>02</sub></b> | Lowest dose (or concentration) to cause lethal or toxic effects       |
| <b>IARC</b>   | International Agency for Research on Cancer                           |
| <b>NTP</b>  | National Toxicology Program   |
| <b>RTECS</b>  | Registry of Toxic Effects of Chemical Substances                      |
| <b>BCF</b>  | Bioconcentration Factor   |
| <b>TL<sub>m</sub></b>   | Median threshold limit  |
| <b>log K<sub>OW</sub> or log K<sub>OC</sub></b>   | Coefficient of Oil/Water Distribution                                 |

### REGULATORY INFORMATION:

|              |  |
|--------------|--|
| <b>WHMIS</b> | Canadian Workplace Hazardous Material Information System |
| <b>DOT</b>   | U.S. Department of Transportation                        |
| <b>TC</b>    | Transport Canada   |
| <b>EPA</b>   | U.S. Environmental Protection Agency                     |
| <b>DSL</b>   | Canadian Domestic Substance List                         |
| <b>NDSL</b>  | Canadian Non-Domestic Substance List                     |
| <b>PSL</b>   | Canadian Priority Substances List                        |
| <b>TSCA</b>  | U.S. Toxic Substance Control Act                         |
| <b>EU</b>    | European Union (European Union Directive 67/548/EEC)     |
| <b>WGK</b>   | Wassergefährdungsklassen (German Water Hazard Class)     |

### WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

|            |           |           |          |            |            |           |          |
|------------|-----------|-----------|----------|------------|------------|-----------|----------|
|            |           |           |          |            |            |           |          |
| Class A    | Class B   | Class C   | Class D1 | Class D2   | Class D3   | Class E   | Class F  |
| Compressed | Flammable | Oxidizing | Toxic    | Irritation | Infectious | Corrosive | Reactive |

### EC (67/548/EEC) INFORMATION:

|           |           |           |         |           |       |          |         |
|-----------|-----------|-----------|---------|-----------|-------|----------|---------|
|           |           |           |         |           |       |          |         |
| Corrosive | Explosive | Flammable | Harmful | Oxidizing | Toxic | Irritant | Harmful |

### CLP/GHS (1272/2008/EC) PICTOGRAMS:

|           |           |          |             |           |       |                    |               |             |
|-----------|-----------|----------|-------------|-----------|-------|--------------------|---------------|-------------|
|           |           |          |             |           |       |                    |               |             |
| GHS01     | GHS02     | GHS03    | GHS04       | GHS05     | GHS06 | GHS07              | GHS08         | GHS09       |
| Explosive | Flammable | Oxidizer | Pressurized | Corrosive | Toxic | Harmful Irritating | Health Hazard | Environment |