


## 1. PRODUCT & COMPANY IDENTIFICATION

|     |                              |  |
|-----|------------------------------|--|
| 1.1 | Product Name:                | <b>ARCTIC FREEZE® REFRIGERANT w/DISPENSER &amp; GAUGE - CARB CERTI</b> |
| 1.2 | Chemical Name:               | 1,1,1,2-Tetrafluoroethane  |
| 1.3 | Synonyms:                    | P/N 68286  |
| 1.4 | Trade Names:                 | Arctic Freeze®   |
| 1.5 | Product Uses & Restrictions: | Refrigerant  |
| 1.6 | Distributor's Name:          | Harbor Freight Tools USA, Inc.   |
| 1.7 | Distributor's Address:       | 26541 Agoura Road, Calabasas, CA 91302 USA                             |
| 1.8 | Emergency Phone:             | <b>CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN 676687)</b>    |
| 1.9 | Business Phone / Fax:        | +1 (805) 388-1000  |

## 2. HAZARDS IDENTIFICATION

|     |                        |  |   |
|-----|------------------------|--|---|
| 2.1 | Hazard Identification: | <p>This product is classified as a HAZARDOUS SUBSTANCE and as DANGEROUS GOODS according to the classification criteria of NOHSC: 1008(2004) and ADG Code (Australia). KEEP OUT OF REACH OF CHILDREN.</p> <p><b>WARNING. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.</b></p> <p><u>Classification:</u> Liquefied Gas.</p> <p><u>Hazard Statements (H):</u> H280 – Contains gas under pressure; may explode if heated.</p> <p><u>Precautionary Statements (P):</u> P280 – Wear protective gloves and eye protection. P302 + P352 - IF ON SKIN – Wash with soap and water. P333 + P313 - If skin irritation or a rash occurs – Get medical advice/attention. P305+P351+P338 – IF IN EYES - Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice/attention. P304 - IF INHALED: Move to fresh air. If breathing has stopped, give artificial respiration and call physician immediately. P410 + P412 - Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122°F. P410+P403 – Protect from sunlight. Store in a well-ventilated place. P501 – Dispose of contents/container through licensed treatment, storage or disposal facility.</p> |  |
|-----|------------------------|--|---|

## 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 |    |          |
| 1,1,1,2-TETRAFLUOROTHANE            | 811-97-2       | KI8842500 | 212-377-0  | 100   | NA  | NA   | 4240   | NF      | NF      | NF   | NA   | NA   | NA | 1000 TWA |
|                                     | Liq. Gas; H280 |           |            |       |   |      |        |         |         |      |      |      |    |          |
| POLYALKYLENE GLYCOL MONOBUTYL ETHER | NA             | NA        | NA         | 5-15  | NA  | NA   | NF     | NF      | NF      | NA   | NA   | NA   |    |          |
| ADDITIVE PACKAGE                    | NA             | NA        | NA         | 1-10  | NA  | NA   | NF     | NF      | NF      | NA   | NA   | NA   |    |          |
| LEAK SEALER                         | NA             | NA        | NA         | 0.1-1 | NA  | NA   | NF     | NF      | NF      | NA   | NA   | NA   |    |          |


## 4. FIRST AID MEASURES

|     |                      |  |
|-----|----------------------|--|
| 4.1 | First Aid:           | <p><u>Ingestion:</u> If ingested, do not induce vomiting. Contact the nearest Poison Control Center or local emergency number. Provide an estimate of the time at which the material was ingested and the amount of the substance that was swallowed.</p> <p><u>Eyes:</u> Splashes are not likely; however, if product gets in the eyes, flush with copious amounts of lukewarm water for at least 15 minutes. If irritation occurs, contact a physician.</p> <p><u>Skin:</u> If irritation occurs and product is on the skin, rinse thoroughly with lukewarm water, followed by a thorough washing of the affected area with soap and water. If irritation, redness or swelling persists, contact a physician immediately.</p> <p><u>Inhalation:</u> Remove victim to fresh air at once. If breathing is difficult, provide supplemental oxygen. If breathing has stopped, provide artificial respiration. Seek immediate medical attention. Provide supportive treatment, keeping victim warm and quiet.</p> |
| 4.2 | Effects of Exposure: | <p><u>Ingestion:</u> If product is swallowed, may cause nausea, vomiting and/or diarrhea.</p> <p><u>Eyes:</u> "Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes. Mists may cause irritation.</p> <p><u>Skin:</u> Frostbite-like" effects may occur if the liquid or escaping vapors contact the skin. Mists may cause irritation.</p> <p><u>Inhalation:</u> Gross overexposure may cause central nervous system depression, dizziness, confusion, incoordination, drowsiness, irregular heartbeat accompanied by a strange feeling in the chest, "heart thumping," apprehension, light-headedness, weakness, fainting, loss of consciousness, and death.</p>  |

## 4. FIRST AID MEASURES – cont'd

|     |  |   |
|-----|--|---|
| 4.3 | Symptoms of Overexposure:                  | Inhalation may cause dizziness, confusion, incoordination, drowsiness, irregular heartbeat accompanied by a strange feeling in the chest, "heart thumping", apprehension, light-headedness, weakness, fainting, loss of consciousness, and death. |
| 4.4 | Acute Health Effects:                      | "Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes. Mists may cause irritation.   |
| 4.5 | Chronic Health Effects:                    | "Frostbite-like" effects may occur if the liquid or escaping vapors contact the skin. Mists may cause irritation.   |
| 4.6 | Target Organs:                             | Eyes, Skin, Respiratory System  |
| 4.7 | Medical Conditions Aggravated by Exposure: | Pre-existing dermatitis, other skin conditions, and disorders of the target organs (eyes and skin). Pre-existing cardiovascular or central nervous system diseases.   |
|     |  | <b>HEALTH</b> 1   |
|     |  | <b>FLAMMABILITY</b> 0   |
|     |  | <b>PHYSICAL HAZARDS</b> 1   |
|     |  | <b>PROTECTIVE EQUIPMENT</b> B   |
|     |  | EYES SKIN   |

## 5. FIREFIGHTING MEASURES

|     |                           |  |   |
|-----|---------------------------|--|---|
| 5.1 | Fire & Explosion Hazards: | This product is non-flammable. Cylinders may rupture under fire conditions. This material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Decomposition may occur. Contact of welding or soldering torch flames with high concentrations of refrigerant can result in visible changes in the size and color of the torch flame. The flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate the area before proceeding. Use forced ventilation to disperse refrigerant vapors from the work area before using any open flames. |  |
| 5.2 | Extinguishing Methods:    | Water, Foam, CO <sub>2</sub> , Dry Chemical. Use media appropriate for surrounding materials.  |   |
| 5.3 | Firefighting Procedures:  | As in any fire, wear MSHA/NIOSH approved self-contained breathing apparatus (pressure-demand) and full protective gear. 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. Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.  |   |


## 6. ACCIDENTAL RELEASE MEASURES

|     |         |   |
|-----|---------|---|
| 6.1 | Spills: | Before cleaning any spill or leak, individuals involved in spill cleanup must wear appropriate Personal Protective Equipment (PPE). Secure spill area, remove or minimize all sources of ignition, and maximize ventilation. Stop spill or leak at source if safely possible. Deny entry to all unprotected individuals. Individuals involved in the cleanup must wear appropriate personal protective equipment. Recover free liquid or cover with inert absorbent material and place into appropriate container(s) for disposal. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers or any natural waterway or drinking supply. Contact appropriate local and/or provincial authorities for assistance and/or reporting requirements. |
|-----|---------|---|



## 7. HANDLING & STORAGE INFORMATION

|     |                           |   |
|-----|---------------------------|---|
| 7.1 | Work & Hygiene Practices: | Use normal hygiene practices. Avoid direct skin contact. Wash hands thoroughly after using this product and before eating, drinking, or smoking.  |
| 7.2 | Storage & Handling:       | Use and store in a cool, dry, well-ventilated area. Keep away from excessive heat, open flames, sparks, and other possible sources of ignition. Do not store near or with any incompatible materials listed in section 10. Do not store in unmarked or open containers. Protect cylinders from physical damage. Do not store in subsurface areas. |
| 7.3 | Special Precautions:      | Readily available emergency fire, first aid, and spill response equipment and/or measures are highly recommended.   |

## 8. EXPOSURE CONTROLS & PERSONAL PROTECTION

|     |  |   |   |      |        |         |         |      |      |      |          |
|-----|--|---|---|------|--------|---------|---------|------|------|------|----------|
| 8.1 | Exposure Limits:<br>ppm (mg/m <sup>3</sup> ) |   | ACGIH   |      | NOHSC  |         |         | OSHA |      |      | OTHER    |
|     |  | <b>CHEMICAL NAME(S)</b>   | TLV   | STEL | ES-TWA | ES-STEL | ES-PEAK | PEL  | STEL | IDLH |          |
|     |  | 1,1,1,2-TETRAFLUOROETHANE   | NA  | NA   | 4240   | NF      | NF      | NA   | NA   | NA   | 1000 TWA |
| 8.2 | Ventilation & Engineering Controls:          | Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas. |   |      |        |         |         |      |      |      |          |
| 8.3 | Respiratory Protection:                      | No special respiratory protection is required under typical circumstances of use or handling. If necessary, use only respiratory protection authorized per U.S. OSHA's requirement in 29 CFR §1910.134, or applicable U.S. state regulations, or the appropriate standards of Canada, its provinces, EU member states, or Australia.  |   |      |        |         |         |      |      |      |          |
| 8.4 | Eye Protection:                              | <b>AVOID EYE CONTACT DUE TO FROSTBITE POTENTIAL.</b> Safety glasses with side shields should be used with this product. If splashing is anticipated, splash goggles and a faceshield are recommended.   |  |      |        |         |         |      |      |      |          |

## 8. EXPOSURE CONTROLS & PERSONAL PROTECTION – cont'd

|     |                  |  |   |
|-----|------------------|--|---|
| 8.5 | Hand Protection: | Use gloves constructed of chemical-resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. If necessary, refer to U.S. OSHA 29 CFR §1910.138, the appropriate standards of Canada, or the EU member states.   |  |
| 8.6 | Body Protection: | Avoid prolonged and/or repeated skin contact. Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing should include long-sleeves, apron, boots and additional facial protection. If necessary, refer to appropriate standards of Canada, the EU member states, or U.S. OSHA. |  |

## 9. PHYSICAL & CHEMICAL PROPERTIES

|      |   |   |
|------|---|---|
| 9.1  | Appearance:                                   | Pressurized clear liquid.                                     |
| 9.2  | Odor:   | slight ethereal odor.   |
| 9.3  | Odor Threshold:                               | NA  |
| 9.4  | pH:   | 4.00-5.00   |
| 9.5  | Melting Point/Freezing Point:                 | NA  |
| 9.6  | Initial Boiling Point/Boiling Range:          | NA  |
| 9.7  | Flashpoint:                                   | 204 °C (399 °F) (liquid portion of product)                   |
| 9.8  | Upper/Lower Flammability Limits:              | LEL: 11,000 ppm / UEL: 94,000 ppm (liquid portion of product) |
| 9.9  | Vapor Pressure:                               | NA  |
| 9.10 | Vapor Density:                                | NA  |
| 9.11 | Relative Density:                             | NA  |
| 9.12 | Solubility:                                   | Insoluble   |
| 9.13 | Partition Coefficient (log P <sub>ow</sub> ): | NA  |
| 9.14 | Autoignition Temperature:                     | >400 °C (752 °F)  |
| 9.15 | Decomposition Temperature:                    | NA  |
| 9.16 | Viscosity:                                    | NA  |
| 9.17 | Other Information:                            | NA  |

## 10. STABILITY & REACTIVITY

|      |                                   |   |
|------|-----------------------------------|---|
| 10.1 | Stability:                        | This product is stable.   |
| 10.2 | Hazardous Decomposition Products: | Warning! Hazardous decomposition products are hazardous. Thermal decomposition can yield hydrofluoric acid and possibly carbonyl fluoride. These materials are toxic and irritating. Contact should be avoided. |
| 10.3 | Hazardous Polymerization:         | Will not occur.   |
| 10.4 | Conditions to Avoid:              | Open flames, sparks, high heat, and close proximity to incompatible substances.   |
| 10.5 | Incompatible Substances:          | Alkalis, and alkaline earth materials   |

## 11. TOXICOLOGICAL INFORMATION

|      |                              |   |                 |                |
|------|------------------------------|---|-----------------|----------------|
| 11.1 | Routes of Entry:             | Inhalation: YES   | Absorption: YES | Ingestion: YES |
| 11.2 | Toxicity Data:               | The product has not been tested for specific toxicity data. Animal studies, available in scientific literature, have shown that this material is a slight irritant, but not a sensitizer.   |                 |                |
| 11.3 | Acute Toxicity:              | See section 4.4   |                 |                |
| 11.4 | Chronic Toxicity:            | See section 4.5   |                 |                |
| 11.5 | Suspected Carcinogen:        | No  |                 |                |
| 11.6 | Reproductive Toxicity:       | This product is not reported to produce reproductive toxicity in humans.  |                 |                |
|      | Mutagenicity:                | Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals.   |                 |                |
|      | Embryotoxicity:              | Animal data shows slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal.  |                 |                |
|      | Teratogenicity:              | This product is not reported to produce teratogenic effects in humans.  |                 |                |
|      | Reproductive Toxicity:       | In a 2-year inhalation study, HFC-134A, at a concentration of 50,000 ppm, produced an increase in late-occurring benign testicular tumors, testicular hyperplasia and testicular weight in mice. The no-effect-level for this study was 10,000ppm. However, no change in reproductive performance was reported. |                 |                |
| 11.7 | Irritancy of Product:        | Slight  |                 |                |
| 11.8 | Biological Exposure Indices: | NE  |                 |                |
| 11.9 | Physician Recommendations:   | Treat symptomatically. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.  |                 |                |

## 12. ECOLOGICAL INFORMATION

|      |                              |   |
|------|------------------------------|---|
| 12.1 | Environmental Stability:     | There are no specific data available for this product.  |
| 12.2 | Effects on Plants & Animals: | There are no specific data available for this product.  |
| 12.3 | Effects on Aquatic Life:     | 1,1,1,2-Tetrafluoroethane; EC <sub>50</sub> (Daphnia magna, 48h): 980 mg/L; LC <sub>50</sub> (Rainbow trout, 96h): 450 mg/L |

## 13. DISPOSAL CONSIDERATIONS

|      |                         |   |
|------|-------------------------|---|
| 13.1 | Waste Disposal:         | Dispose of in accordance with federal, state, provincial and local regulations. |
| 13.2 | Special Considerations: | NA  |

## 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 and the CTDGR.

|      |                      |  |  |
|------|----------------------|--|--|
| 14.1 | 49 CFR (GND):        | CONSUMER COMMODITY, ORM-D, DOT-SP 10232 - until 12/31/2020<br>UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)                                  |  |
| 14.2 | IATA (AIR):          | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)  |  |
| 14.3 | IMDG (OCN):          | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)  |  |
| 14.4 | TDGR (Canadian GND): | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L); or MARK PACKAGE "LIMITED QUANTITY/QUANTITÉ LIMITÉE" or "LTD QTY/QUANT LTÉE" (IP VOL ≤ 0.12 L) |  |
| 14.5 | ADR/RID (EU):        | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)  |  |
| 14.6 | SCT (MEXICO):        | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)  |  |
| 14.7 | ADGR (AUS):          | UN3159, 1,1,1,2-TETRAFLUOROETHANE, 2.2 (LTD QTY, IP VOL ≤ 0.12 L)  |  |

## 15. REGULATORY INFORMATION

|      |                                   |   |
|------|-----------------------------------|---|
| 15.1 | SARA Reporting Requirements:      | This product does not contain any substances subject to SARA Title III, section 313 reporting requirements.   |
| 15.2 | SARA Threshold Planning Quantity: | There are no specific Threshold Planning Quantities for the components of this product.   |
| 15.3 | TSCA Inventory Status:            | The components of this product are listed on the TSCA Inventory or are otherwise exempt.  |
| 15.4 | CERCLA Reportable Quantity (RQ):  | NA  |
| 15.5 | Other Federal Requirements:       | None of the ingredients are listed as Hazardous Air Pollutants (HAPs). None of the ingredients are listed as Toxic Pollutants under the Clean Water Act (CWA). None of the ingredients are listed as Priority Pollutants under the Clean Water Act (CWA).   |
| 15.6 | Other Canadian Regulations:       | This product has been classified according to the hazard criteria of the CPR and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDL. None of the components of this product are listed on the Priorities Substances List. WHMIS A (Compressed Gas)   |
| 15.7 | State Regulatory Information:     | 1,1,1,2-Tetrafluoroethane is listed on the following state criteria lists: California Right-to-Know List; Minnesota Right-to-Know list; Massachusetts Right to Know List of Chemicals; New Jersey Right to Know List 8:59 Appendix A. No other 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 (CA65), Delaware Air Quality Management List (DE), 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 components of this product are not listed in Annex I of EU Directive 67/548/EEC: Irritant (Xi). <u>Risk Phrases</u> (R): 36 – Irritating to eyes. <u>Safety Phrases</u> (S): 2-25-26 – Keep out of reach of children. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  |

## 16. OTHER INFORMATION

|      |                      |   |  |
|------|----------------------|---|--|
| 16.1 | Other Information:   | <p><b>WARNING. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.</b> Wear protective gloves and eye protection. IF ON SKIN – Wash with soap and water. If skin irritation or a rash occurs – Get medical advice/attention. IF IN EYES - Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. If eye irritation persists: Get medical advice/attention. IF INHALED: Move to fresh air. If breathing has stopped, give artificial respiration and call physician immediately. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Protect from sunlight. Store in a well-ventilated place. <b>KEEP OUT OF REACH OF CHILDREN. USE AND STORE IN WELL VENTILATED AREAS.</b></p> <p><b>WARNING:</b> Inhalation of concentrated levels can cause dizziness, ventricular arrhythmia or even death. Use only with adequate ventilation. Avoid prolonged breathing of vapors or spray.</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; Harbor Freight Tools USA, Inc.'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>Harbor Freight Tools USA, Inc.</b><br/>26541 Agoura Road<br/>Calabasas, CA 91302 USA<br/>Tel: +1 (805) 388-1000<br/><a href="http://www.harborfreight.com">http://www.harborfreight.com</a></p>   |  <p><b>HARBOR FREIGHT TOOLS</b><br/>Quality Tools at Ridiculously Low Prices</p> |
| 16.5 | Prepared by:         | <p><b>ShipMate, Inc.</b><br/>P.O. Box 787<br/>Sisters, Oregon 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>  |  |

Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 5.0

SDS Revision Date: 12/24/2015

## 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>C</b>     | Ceiling Limit   |
| <b>ES</b>    | Exposure Standard (Australia)                             |
| <b>IDLH</b>  | Immediately Dangerous to Life and Health                  |
| <b>OSHA</b>  | U.S. Occupational Safety and Health Administration        |
| <b>PEL</b>   | Permissible Exposure Limit                                |
| <b>STEL</b>  | Short-Term Exposure Limit                                 |
| <b>TLV</b>   | Threshold Limit Value                                     |
| <b>TWA</b>   | Time Weighted Average                                     |

### 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. |
|------------|--|

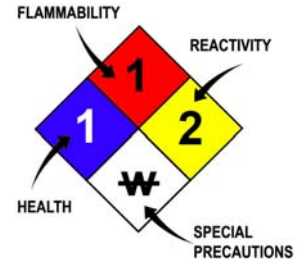
### HMIS-III HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

|   |                 |
|---|-----------------|
| 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> |

### HAZARD RATINGS:

|                |                 |
|----------------|-----------------|
| 0              | Minimal Hazard  |
| 1              | Slight Hazard   |
| 2              | Moderate Hazard |
| 3              | Severe Hazard   |
| 4              | 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>10</sub></b>  | Lowest dose to cause a symptom  |
| <b>TCLo</b>   | Lowest concentration to cause a symptom                               |
| <b>TD<sub>10</sub>, LD<sub>10</sub>, &amp; LD<sub>01</sub> or TC, TC<sub>01</sub>, LC<sub>10</sub>, &amp; LC<sub>01</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>NOHSC</b>    | National Occupational Health and Safety Commission (Australia)                  |
| <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)                            |
| <b>HMIS-III</b> | National Paint & Coatings Association Hazardous Materials Identification System |

### 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:

|           |           |           |         |           |       |          |         |
|-----------|-----------|-----------|---------|-----------|-------|----------|---------|
|           |           |           |         |           |       |          |         |
| C         | E         | F         | N       | O         | T     | Xi       | Xn      |
| 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 |

### PERSONAL PROTECTION RATINGS:

|          |  |          |  |
|----------|--|----------|--|
| <b>A</b> |  | <b>G</b> |  |
| <b>B</b> |  | <b>H</b> |  |
| <b>C</b> |  | <b>I</b> |  |
| <b>D</b> |  | <b>J</b> |  |
| <b>E</b> |  | <b>K</b> |  |
| <b>F</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>ML</b>    | Maximum Limit                      |
| <b>mg/m3</b> | milligrams per cubic meter         |
| <b>NA</b>    | Not Available                      |
| <b>ND</b>    | Not Determined                     |
| <b>NE</b>    | Not Established                    |
| <b>NF</b>    | Not Found                          |
| <b>NR</b>    | No Results                         |
| <b>ppm</b>   | parts per million                  |
| <b>SCBA</b>  | Self-Contained Breathing Apparatus |

### NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

#### FLAMMABILITY LIMITS IN AIR:

|                                 |   |
|---------------------------------|---|
| <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 |