## 1. PRODUCT & COMPANY IDENTIFICATION

| | | |
|---|---|---|
| 1.1 | Product Name: | **C HEAVY DUTY BATTERIES** |
| 1.2 | Chemical Name: | Zinc Manganese Dioxide Battery |
| 1.3 | Synonyms: | P/N 61274 |
| 1.4 | Trade Names: | Thunderbolt Magnum |
| 1.5 | Product Uses & Restrictions: | Electric Storage Battery |
| 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: | **CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN 676687)** |
| 1.9 | Business Phone / Fax: | +1 (805) 388-1000 |

## 2. HAZARDS IDENTIFICATION

2.1 Hazard Identification:

This product is classified as a hazardous substance and as dangerous goods according to the classification criteria of [NOHSC: 1088 (2004)] and ADG Code (Australia).

**WARNING! HARMFUL IF SWALLOWED. TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.**

Hazard Statements (H): H302 – Harmful if swallowed. H411 – Toxic to aquatic life with long lasting effects.

Precautionary Statements (P): P264 – Wash hands and exposed skin areas with soap and warm water thoroughly after handling. P270 – Do not eat, drink or smoke while sing this product. P273 – Avoid release to the environment. P280 – Wear protective gloves/eye protection. P301+P312 – IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. P330 – Rinse mouth. P391 – Collect spillage. P501 – Dispose of contents/container to licenses treatment, storage and disposal facility (TSDF).

**IF INGESTED: Call the NATIONAL BATTERY INGESTION HOTLINE at +1 (202) 625-3333 collect, day or night. In Canada, call +1 (416) 813-5900.**

## 3. COMPOSITION & INGREDIENT INFORMATION

| CHEMICAL NAME(S) | CAS No. | RTECS No. | EINECS No. | % | EXPOSURE LIMITS IN AIR (mg/m³) ACGIH ppm TLV | ACGIH ppm STEL | NOHSC ppm ES-TWA | NOHSC ppm ES-STEL | NOHSC ppm ES-PEAK | OSHA ppm PEL | OSHA ppm STEL | OSHA ppm IDLH | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZINC | 7440-66-6 | ZG8600000 | 231-175-3 | 15-40 | NA | NA | NF | NF | NF | NA | NA | NA | |
| | Aquatic Acute 1; Aquatic Chronic 1; H400, H410 | | | | | | | | | | | | |
| MANGANESE DIOXIDE | 1313-13-9 | OP0350000 | 215-202-6 | 15-40 | (5) | NA | (5) | NF | NF | (5) | NA | NA | |
| | Acute Tox. Oral 4; Acute Tox. Inh. 4; H302, H332 | | | | | | | | | | | | |
| ZINC CHLORIDE | 7646-85-7 | ZH1400000 | 231-592-0 | 7-13 | (1) | NA | (1) | NF | 5 | (1) | NA | 50 | FUME |
| | Acute Tox. 4 *; Skin Corr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H302, H314, H400, H410 | | | | | | | | | | | | |
| AMMONIUM CHLORIDE | 12125-02-9 | BP4550000 | 235-186-4 | 7-13 | (10) | NA | (10) | (20) | NF | (10) | NA | NA | |
| | Acute Tox. 4, Eye Irrit. 2; H302, H319 | | | | | | | | | | | | |
| LEAD | 7439-92-1 | OF7525000 | 231-100-4 | < 0.4 | (0.05) | NA | NF | (0.15) | NF | NA | 100 | NA | |
| | Acute Tox. 4; Acute Tox. 4; Repr. 1A; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H302, H332, H360, H373, H400, H410 | | | | | | | | | | | | |
| CADMIUM | 7440-43-9 | NA | 231-152-8 | < 0.002 | (0.01) | NA | NF | NF | NF | (0.1) | 0.3 | (9) | (0.02) RESP FRAC |
| | Acute Tox. 2; Muta. 2; Carc. 1B; Repr. 2; STOT SE 1; Aq. Acute 1; Aq. Chronic 1; H330, H341, H350, H361fd, H372, H400, H410 | | | | | | | | | | | | |
| MERCURY | 7439-97-6 | OV4550000 | 231-106-7 | < 0.0001 | NA | NA | (0.003) | (0.025) | NA | NA | NA | (10) | |
| | Repr. 1B; Acute Tox. 2 *; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H360D***, H330, H372**, H400, H410 | | | | | | | | | | | | |

## 4. FIRST AID MEASURES

4.1 First Aid:

Ingestion: Give large quantities of water, but do NOT induce vomiting. Never give anything by mouth to an unconscious person. Contact 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.

Eyes: 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.

Skin: If an open battery cell: 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.

Inhalation: Remove victim to fresh air at once. Under extreme conditions, if breathing stops, perform artificial respiration. Seek immediate medical attention.

## 4. FIRST AID MEASURES – cont'd

| | | |
|---|---|---|
| 4.2 | Effects of Exposure: | Ingestion: May cause severe irritation of mouth, throat, esophagus, and stomach. Acute ingestion of zinc compounds may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping.<br>Eyes: Severe irritation, burns, cornea damage, blindness. Lead compounds may cause irritation.<br>Skin: Severe irritation, burns, and ulceration if open battery cell comes into contact with skin.<br>Inhalation: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs. |
| 4.3 | Symptoms of Overexposure: | Ingestion: Severe discomfort, nausea, vomiting and headache. Harmful if swallowed. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.<br>Eyes: May cause irreversible eye injury. Contact with eyes may cause severe irritation, and possible eye burns. Severe irritation, redness, and watering.<br>Skin: Severe skin irritation, red, itching skin, burns and ulceration, if open battery cell comes into contact with skin.<br>Inhalation: May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Irritation may lead to chemical pneumonitis and pulmonary edema. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. Causes respiratory tract irritation with possible burns. |
| 4.4 | Acute Health Effects: | Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume. |
| 4.5 | Chronic Health Effects: | Chronic exposure may cause effects similar to those of acute exposure. |
| 4.6 | Target Organs: | Skin, Respiratory System, Central Nervous System (CNS) |
| 4.7 | Medical Conditions Aggravated by Exposure: | NA |

| | |
|---|---|
| HEALTH | 1 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARDS | 0 |
| PROTECTIVE EQUIPMENT | B |
| EYES / SKIN | |

## 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| 5.1 | Fire & Explosion Hazards: | This material can burn but will not readily ignite. However, if involved in a fire, this product may decompose at high temperatures to form toxic gases (e.g., CO, $CO_2$, Hydrocarbons). |
| 5.2 | Extinguishing Methods: | $CO_2$, Dry Chemical, Alcohol Foam, Dry Chemical. Use water spray to cool containers. |
| 5.3 | Firefighting Procedures: | Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out. 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, including protective gloves and eyewear. Plastic or rubber gloves, respirator, eye/face protection and chemical-resistant apron may be required for clean-up of large spills.<br>Small Spills: Wear appropriate protective equipment including gloves and protective eyewear. Use a non-combustible material such as vermiculite or sand to soak up the product and place into a container for later disposal.<br>Large Spills: Keep incompatible materials 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. Collect in acid-resistant container. |

## 7. HANDLING & STORAGE INFORMATION

| | | |
|---|---|---|
| 7.1 | Work & Hygiene Practices: | Do not eat, drink or smoke when handling this product. Handle as to avoid puncturing container(s). |
| 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. Keep away from incompatible substances. Protect containers from physical damage. Store product in well-filled, appropriate coated and tightly closed containers avoiding influence of oxygen/air, light and humidity. Store at a cool and constant temperature. |
| 7.3 | Special Precautions: | This battery is not designed for recharging. Recharging can cause battery leakage or high pressure rupture, in some cases. Inadvertent charging can happen if a battery is installed backwards. Accidental short circuit for a few seconds will not seriously affect the battery. But prolonged short circuit will cause the battery to lose energy, and can cause the safety release vent to open. Sources of short circuit include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries in devices. |

## 8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1 Exposure Limits: ppm (mg/m$^3$)

| CHEMICAL NAME(S) | ACGIH TLV | ACGIH STEL | NOHSC ES-TWA | NOHSC ES-STEL | NOHSC ES-PEAK | OSHA PEL | OSHA STEL | OSHA IDLH | OTHER |
|---|---|---|---|---|---|---|---|---|---|
| MANGANESE DIOXIDE | (5) | NA | (5) | NF | NF | (5) | NA | NA | |
| ZINC CHLORIDE | (1) | NA | (1) | NF | 5 | (1) | NA | 50 | FUME |
| AMMONIUM CHLORIDE | (10) | NA | (10) | (20) | NF | (10) | NA | NA | |
| LEAD | (0.05) | NA | NF | (0.15) | NF | NA | 100 | NA | |
| CADMIUM | (0.01) | NA | NF | NF | NF | (0.1) | 0.3 | (9) | (0.02) RESP FRAC |
| MERCURY | NA | NA | (0.003) | (0.025) | NA | NA | NA | (10) | |

| | | |
|---|---|---|
| 8.2 | Ventilation & Engineering Controls: | General mechanical (e.g., fans) or natural ventilation is sufficient when this product is in use. 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). |
| 8.3 | Respiratory Protection: | No special respiratory protection is required under typical circumstances of use or handling. In instances where mist or vapors 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. |
| 8.4 | Eye Protection: | Wear protective eyewear (e.g., safety glasses with side-shield) at all times when handling this product. Always use protective eyewear when cleaning spills or leaks. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).  |
| 8.5 | Hand Protection: | Where contact is likely, impervious gloves are recommended. Do not wear rings, watches or jewelry. When handling large quantities of fluid (e.g., ≥ 1 gallon (3.8 L)), wear corrosion-resistant gloves.  |
| 8.6 | Body Protection: | No apron required when handling sealed undamaged battery. Where contact is likely, corrosion-resistant apron, clothing and boots should be worn. Eye wash stations and deluge showers should be available. |

## 9. PHYSICAL & CHEMICAL PROPERTIES

| | | |
|---|---|---|
| 9.1 | Appearance: | Cylindrical battery |
| 9.2 | Odor: | No apparent odor (sealed). Manganese dioxide/zinc powder is black/grey (broken). |
| 9.3 | Odor Threshold: | NA |
| 9.4 | pH: | NA |
| 9.5 | Melting Point/Freezing Point: | NA |
| 9.6 | Initial Boiling Point/Boiling Range: | NA |
| 9.7 | Flashpoint: | NA |
| 9.8 | Upper/Lower Flammability Limits: | NA |
| 9.9 | Vapor Pressure: | NA |
| 9.10 | Vapor Density: | NA |
| 9.11 | Relative Density: | 0.990-1.040 (at 25 °C) |
| 9.12 | Solubility: | Sealed electric battery: Insoluble. |
| 9.13 | Partition Coefficient (log $P_{ow}$): | 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: | Stable under normal conditions; unstable with heat or contamination. |
| 10.2 | Hazardous Decomposition Products: | Oxides of carbon (CO, $CO_2$). |
| 10.3 | Hazardous Polymerization: | Will not occur. |
| 10.4 | Conditions to Avoid: | Open flames, sparks, high heat, incompatible substances and direct sunlight. |
| 10.5 | Incompatible Substances: | Avoid extreme heat and ignition sources. Store away from oxidizers. Do not exceed heat, crush, disassemble, short-circuit or recharge. |

## 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 toxicology data. Toxicology data, found in scientific literature, is available for some of the components of the product and is presented below:<br>Zinc Chloride: $LD_{50}$ (oral, rat): 350 mg/kg; Manganese Dioxide: $LD_{50}$ (oral, rat): 3,478 mg/kg |
| 11.3 | Acute Toxicity: | See section 4.4 |
| 11.4 | Chronic Toxicity: | See section 4.5 |
| 11.5 | Suspected Carcinogen: | Cadmium is listed as ACGIH Group A2 (Suspected human carcinogen); IARC Group 1 (Carcinogenic to humans); NTP13 Group 1 (Known human carcinogen); CA65 (cancer). Lead is listed as ACGIH Group A3 (Confirmed animal carcinogen with unknown relevance to human); IARC Group 2B (Possibly carcinogenic to humans); NTP13 Group 2 (Reasonably Anticipated to be a Human Carcinogen); CA65 (cancer). |
| 11.6 | Reproductive Toxicity: | This product contains Lead, which is suspected of causing reproductive toxicity in humans. |
| | Mutagenicity: | This product is not reported to produce mutagenic 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 contains Lead, which is suspected of causing reproductive toxicity in humans. |
| 11.7 | Irritancy of Product: | The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) upon prolonged or repeated exposure. |
| 11.8 | Biological Exposure Indices: | NA |
| 11.9 | Physician Recommendations: | Treat symptomatically and supportively. |

## 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: | There are 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: | 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): | 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 Lead and Zinc, 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): | Zinc: 454 kg (1,000 lbs); Mercury: 0.454 kg (1.0 lbs) |
| 15.5 | Other Federal Requirements: | Mercury, Lead and Cadmium are listed as Hazardous Air Pollutants (HAPs) under the Clean Air Act (CAA). Zinc, Cadmium and Mercury are listed as Priority Pollutants under the Clean Water Act (CWA). Zinc, Lead, Cadmium and Mercury are listed as Toxic Pollutants under the CWA. This product does not contain any Class 1 or Class 2 ozone depletors. |
| 15.6 | Other Canadian Regulations: | This product has been classified according to the hazard criteria of the CPR and the Safety Data Sheet 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. REGULATORY INFORMATION – cont'd

| | | |
|---|---|---|
| 15.7 | State Regulatory Information: | Lead can be found on the following state criteria list: California Proposition 65 (CA65), 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), and Washington Permissible Exposures List (WA).<br>Manganese Dioxide is found on the following state criteria lists: IL, MA, PA, and RI.<br>Zinc is found on the following state criteria lists: IL, MA, NJ, and PA.<br>Mercury is found on the following state criteria lists: FL, MA, MI, MN, NJ, PA, WA, and WI.<br>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), Illinois Hazardous Substances List (IL), 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), Rhode Island Hazardous Substances List (RI), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI).<br>**WARNING:** This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires this warning be given to customers in the State of California. |
| 15.8 | Other Requirements: | The primary component of this product is listed in Annex I of EU Directive 67/548/EEC:<br>Zinc Chloride: Corrosive (C); Environmental Danger (N). Risk Phrases (R): 22-34-50/53 – Harmful if swallowed. Causes burns. Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment. Safety Phrases (S): 1/2-26-36/37/39-45-60-61 – Keep locked up and out of reach of children. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing/ gloves and eye/face protection. In case of accident or if you feel unwell seek medical advice immediately (show label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/SDS.  |

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| 16.1 | Other Information: | **WARNING! HARMFUL IF SWALLOWED. TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.**<br>Wash hands and exposed skin areas with soap and warm water thoroughly after handling. Do not eat, drink or smoke while sing this product. Avoid release to the environment. P280 – Wear protective gloves/eye protection. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. Collect spillage.<br>**IF INGESTED: Call the NATIONAL BATTERY INGESTION HOTLINE at +1 (202) 625-3333 collect, day or night. In Canada, call +1 (416) 813-5900. KEEP OUT OF REACH OF CHILDREN.** |
| 16.2 | Terms & Definitions: | See last page of this Safety Data Sheet. |
| 16.3 | Disclaimer: | 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 & 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. |
| 16.4 | Prepared for: | **Harbor Freight Tools USA, Inc.**<br>26541 Agoura Road<br>Calabasas, CA 91302 USA<br>Tel: +1 (805) 388-1000<br>http://www.harborfreight.com<br>HARBOR FREIGHT TOOLS<br>Quality Tools at Ridiculously Low Prices |
| 16.5 | Prepared by: | **ShipMate, Inc.**<br>P.O. Box 787<br>Sisters, Oregon 97759-0787 USA<br>Tel: +1 (310) 370-3600<br>Fax: +1 (310) 370-5700<br>http://www.shipmate.com |

## 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:

| | |
|---|---|
| **CAS No.** | Chemical Abstract Service Number |

### EXPOSURE LIMITS IN AIR:

| | |
|---|---|
| **ACGIH** | American Conference on Governmental Industrial Hygienists |
| **C** | Ceiling Limit |
| **ES** | Exposure Standard (Australia) |
| **IDLH** | Immediately Dangerous to Life and Health |
| **OSHA** | U.S. Occupational Safety and Health Administration |
| **PEL** | Permissible Exposure Limit |
| **STEL** | Short-Term Exposure Limit |
| **TLV** | Threshold Limit Value |
| **TWA** | Time Weighted Average |

### FIRST AID MEASURES:

| | |
|---|---|
| **CPR** | 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 |

| |
|---|
| **HEALTH** |
| **FLAMMABILITY** |
| **PHYSICAL HAZARDS** |
| **PERSONAL PROTECTION** |

### PERSONAL PROTECTION RATINGS:

| | |
|---|---|
| **A** | |
| **B** | |
| **C** | |
| **D** | |
| **E** | |
| **F** | |
| **G** | |
| **H** | |
| **I** | |
| **J** | |
| **K** | |
| **X** | **Consult your supervisor or SOPs for special handling directions.** |


### OTHER STANDARD ABBREVIATIONS:

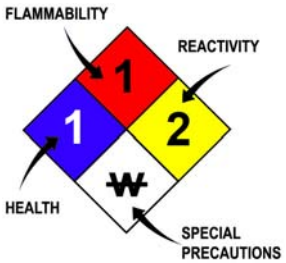
| | |
|---|---|
| **ML** | Maximum Limit |
| **mg/m3** | milligrams per cubic meter |
| **NA** | Not Available |
| **ND** | Not Determined |
| **NE** | Not Established |
| **NF** | Not Found |
| **NR** | No Results |
| **ppm** | parts per million |
| **SCBA** | Self-Contained Breathing Apparatus |

### NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

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

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




### TOXICOLOGICAL INFORMATION:

| | |
|---|---|
| **$LD_{50}$** | Lethal Dose (solids & liquids) which kills 50% of the exposed animals |
| **$LC_{50}$** | Lethal concentration (gases) which kills 50% of the exposed animal |
| **ppm** | Concentration expressed in parts of material per million parts |
| **$TD_{lo}$** | Lowest dose to cause a symptom |
| **TCLo** | Lowest concentration to cause a symptom |
| **$TD_{lo}$, $LD_{lo}$, & $LD_o$ or TC, $TC_o$, $LC_{lo}$, & $LC_o$** | Lowest dose (or concentration) to cause lethal or toxic effects |
| **IARC** | International Agency for Research on Cancer |
| **NTP** | National Toxicology Program |
| **RTECS** | Registry of Toxic Effects of Chemical Substances |
| **BCF** | Bioconcentration Factor |
| **$TL_m$** | Median threshold limit |
| **log $K_{OW}$ or log $K_{OC}$** | Coefficient of Oil/Water Distribution |

### REGULATORY INFORMATION:

| | |
|---|---|
| **WHMIS** | Canadian Workplace Hazardous Material Information System |
| **DOT** | U.S. Department of Transportation |
| **TC** | Transport Canada |
| **EPA** | U.S. Environmental Protection Agency |
| **DSL** | Canadian Domestic Substance List |
| **NOHSC** | National Occupational Health and Safety Commission (Australia) |
| **NDSL** | Canadian Non-Domestic Substance List |
| **PSL** | Canadian Priority Substances List |
| **TSCA** | U.S. Toxic Substance Control Act |
| **EU** | European Union (European Union Directive 67/548/EEC) |
| **WGK** | Wassergefährdungsklassen (German Water Hazard Class) |
| **HMIS-III** | National Paint & Coatings Association Hazardous Materials Identification System |

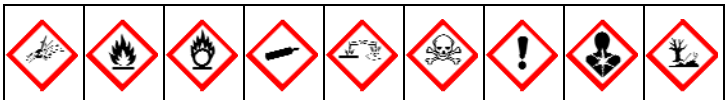
### WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

| 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 | Environ-ment |