## 1. PRODUCT & COMPANY IDENTIFICATION

| | | |
|---|---|---|
| 1.1 | Product Name: | **PRESTO® BRIGHT DIP** |
| 1.2 | Chemical Name: | Acid Mixture |
| 1.3 | Synonyms: | 660040, 660050, 660051 |
| 1.4 | Trade Names: | Presto® Bright Dip |
| 1.5 | Product Use: | Brightener remover from copper, brass and bronze - deoxidizer |
| 1.6 | Distributor's Name: | Birchwood Laboratories LLC |
| 1.7 | Distributor's Address: | 7900 Fuller Road, Eden Prairie, MN 55344 USA |
| 1.8 | Emergency Phone: | **ChemTrec +1 (800) 424-9300 / +1 (703) 527-3887** or **Poison Control Center +1 (855) 281-1742** |
| 1.9 | Business Phone / Fax: | +1 (952) 937-7900 / +1 (952) 937-7979 |

## 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).

**DANGER! MAY BE CORROSIVE TO METALS. CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. TOXIC IF SWALLOWED. CAUSES SKIN IRRITATION. CAUSES SERIOUS EYE IRRITATION. MAY CAUSE RESPIRATORY IRRITAITON. VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.**

Classification: Acute Tox. (Oral) 3; Skin Corr. 1B; Acute Tox. (Skin) 4; Chronic Aq. Tox. 1

**2.2 Label Elements:**

Hazard Statements (H): H290 – May be corrosive to metals. H314 – Causes severe skin burns and eye damage.
H301 – Toxic if swallowed. H319 Causes serious eye irritation. H335 – May cause respiratory irritation. H410 – Very toxic to aquatic life with long lasting effects.
Precautionary Statements (P):P234 – Keep only in original packaging. P264 – Wash thoroughly with soap and water after handling. P270 – Do not eat drink or smoke when using this product. P271 – Use only outdoors or in a well-ventilated area. P273 – Avoid release to the environment. P280 – Wear protective gloves/ eye and face protection. P304+P340 – IF INHALED: Remove person to fresh air at once and keep comfortable for breathing. P310 – Immediately call a POISON CENTER/doctor. P321 Specific treatments see this container label. P305+P351+P338 – IF IN EYES: Rinse cautiously 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. P390 – Absorbs spillage to prevent material-damage. P403+P233 – Store in a well ventilated place. Keep container tightly closed. P405 – Store locked up. P501 - Dispose of contents/ container to an approved waste disposal plant.

**2.3 Other Warnings:**

In the event of an exposure or medical inquiry involving this product, please contact a physician or local poison control center, who may seek advice from the U.S. manufacturer, and show them this SDS.

**KEEP OUT OF REACH OF CHILDREN**.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHOSPHORIC ACID | 7664-38-2 | TB6300000 | 231-633-2 | 50-60 | (1) | (3) | NF | NF | NF | NA | NA | 1000 | |
| | Metal Corr. 1; Skin Corr. 1B; H290, H314 | | | | | | | | | | | | |
| WATER | 7732-18-5 | ZC0110000 | 231-791-2 | 20-40 | NE | NE | NF | NF | NF | NE | NE | NE | |
| ACETIC ACID | 64-19-7 | AF1225000 | 200-580-7 | 5-15 | NA | NA | NF | NF | NF | NA | NA | NA | |
| | Flam. Liq. 3; Skin Corr. 1A; H226, H314 | | | | | | | | | | | | |
| NITRIC ACID | 7697-37-2 | QU5775000 | 231-714-2 | 5-10 | 2 | 4 | 2 | NF | NF | 2 | NA | 25 | |
| | Ox. Liq. 3; Skin Corr. 1A; H272, H314 | | | | | | | | | | | | |

## 4. FIRST AID MEASURES

**4.1 First Aid:**

Ingestion: Do not induce vomiting. Call +1 (855) 281-1742 for emergency medical advice. If vomiting occurs, keep victim's head lowered (forward) to keep vomit from entering the lungs. Call 911 for emergency medical transport if any symptoms noted.

Eyes: Remove and discard contact lenses if worn and flush eyes with large amounts of water for at least 20 minutes. Seek immediate medical attention when done rinsing eyes.

Skin: Remove contaminated clothing and wash exposed skin with large amounts of soap and water. Seek medical attention if any blistering, swelling or open sores develop.

Inhalation: Move victim to fresh air. Contact emergency medical services (911) if any difficulty in breathing occurs or if victim loses consciousness.

## 4. FIRST AID MEASURES – cont'd

| | | |
|---|---|---|
| 4.2 | Effects of Exposure: | Eyes: Severe or permanent eye damage.<br>Skin: Burns upon direct contact.<br>Ingestion: Severe burns of mouth, throat, stomach.<br>Inhalation: Severe irritation or burns in respiratory tract and mucous membranes. Possible lung damage. |
| 4.3 | Symptoms of Overexposure: | Eyes: Redness, burning, irritation, and swelling around eyes<br>Skin: Redness, burning, itching, rash, blistering of skin.<br>Ingestion: Nausea, vomiting, severe abdominal pain.<br>Inhalation: Coughing, wheezing, swelling of throat, irritation in mucous membranes, difficulty breathing. |
| 4.4 | Acute Health Effects: | May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if swallowed. Causes burns. May be harmful if absorbed through skin. |
| 4.5 | Chronic Health Effects: | May damage the nervous system, kidney and/or liver. |
| 4.6 | Target Organs: | Eyes, Skin, Nervous System, Kidneys, Liver, Respiratory System. |
| 4.7 | Medical Conditions Aggravated by Exposure: | Pre-existing dermatitis, other skin conditions, and disorders of the target organs (eyes, skin, and respiratory system) or impaired kidney function may be more susceptible to the effects of this substance. |

| | |
|---|---|
| HEALTH | 3 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARDS | 2 |
| PROTECTIVE EQUIPMENT | H |

| EYES | SKIN | LUNGS |
|---|---|---|

## 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| 5.1 | Fire & Explosion Hazards: | Non-flammable. May react with metals to release hydrogen gas, which can form explosive mixtures with air. May intensity fire; oxidizer. Keep/Store away from clothing/ combustible materials. |
| 5.2 | Extinguishing Methods: | Use fire-extinguishing media appropriate for surrounding materials. |
| 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. Fight fires as for surrounding materials. Hazardous decomposition products may be released. Thermal degradation may produce oxides of carbon, phosphorous, selenium 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: | 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.<br>Small Spills: 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.<br>Large Spills: Keep incompatible materials (e.g., organics such as oil) 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. |

## 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. Keep out of the reach of children. 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 acid-resistant containers. Keep containers covered when not in use. Avoid temperatures above 40 °C (120 °F). Keep away from incompatible substances (see Section 10). Protect containers from physical damage. |
| 7.3 | Special Precautions: | Empty containers may retain hazardous product residues. Keep/Store away from clothing/ combustible materials. |

## 8. EXPOSURE CONTROLS & PERSONAL PROTECTION

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

| | ACGIH | | NOHSC | | | OSHA | | | OTHER |
|---|---|---|---|---|---|---|---|---|---|
| CHEMICAL NAME(S) | TLV | STEL | ES-TWA | ES-STEL | ES-PEAK | PEL | STEL | IDLH | |
| PHOSPHORIC ACID | (1) | (3) | NF | NF | NF | NA | NA | 1000 | |
| NITRIC ACID | 2 | 4 | 2 | NF | NF | 2 | NA | 25 | |

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

| | | | |
|---|---|---|---|
| 8.2 | 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). | |
| 8.3 | Respiratory Protection: | 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. |  |
| 8.4 | Eye Protection: | Safety glasses with side shields must be used when handling or using this product. A protective face shield is also recommended. |  |
| 8.5 | Hand Protection: | Wear protective, chemical-resistant gloves (e.g., neoprene) when using or handling this product. |  |
| 8.6 | Body Protection: | A chemical resistant apron and/or protective clothing are recommended when handling or using this product. |  |

## 9. PHYSICAL & CHEMICAL PROPERTIES

| | | |
|---|---|---|
| 9.1 | Appearance: | Clear liquid |
| 9.2 | Odor: | Odorless |
| 9.3 | Odor Threshold: | 0.29 to 0.98 ppm (Nitric Acid) |
| 9.4 | pH: | 0.85 |
| 9.5 | Melting Point/Freezing Point: | NA |
| 9.6 | Initial Boiling Point/Boiling Range: | > 100 °C (> 212 °F) |
| 9.7 | Flashpoint: | NA |
| 9.8 | Upper/Lower Flammability Limits: | NA |
| 9.9 | Vapor Pressure: | NA |
| 9.10 | Vapor Density: | < 1.0 (Air = 1.0) |
| 9.11 | Relative Density: | 1.055 |
| 9.12 | Solubility: | Complete (water) |
| 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: | Evaporation Rate: < 1.0 (Ethyl Ether = 1.0) |

## 10. STABILITY & REACTIVITY

| | | |
|---|---|---|
| 10.1 | Stability: | Stable under normal conditions |
| 10.2 | Hazardous Decomposition Products: | None known. However, avoid temperatures above 177 ºC / 350 ºF, the onset of polymer decomposition. Thermal decomposition is dependent on time and temperature. |
| 10.3 | Hazardous Polymerization: | Will not occur. |
| 10.4 | Conditions to Avoid: | Use or storage near open flames, sparks, high heat or other heat sources, and proximity to incompatible substances (e.g., strong acids, oxidizers). |
| 10.5 | Incompatible Substances: | Strong oxidizing agents, concentrated caustic and alkaline substances. This product may react with reducing agents. Can react violently with sodium tetrahydroborates. Exothermic reactions with aldehydes, amines, amides, alcohol and glycols, azo-compounds, carbonates, esters, caustics, phenols and cresols, ketones, organophosphates, exooxides, explosives, combustible materials, unsaturated halides, organic peroxides. Phosphoric acid forms flammable gases with sulfides, mercaptans, cyanides, aldehydes. Forms toxic fumes with cyanides, sulfide, fluorides, organic peroxides, and halogenated organics. Mixtures with nitromethanes are explosive. |

## 11. TOXICOLOGICAL INFORMATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11.1 | Routes of Entry: | Inhalation: | YES | Absorption: | YES | Ingestion: | YES |
| 11.2 | Toxicity Data: | Phosphoric Acid: $LD_{50}$ (oral, rat) = 1,530 mg/kg | | | | | |
| 11.3 | Acute Toxicity: | See Section 4.4 | | | | | |
| 11.4 | Chronic Toxicity: | Prolonged exposure may cause chronic effects. Prolonged inhalation may be harmful. Severe exposure can lead to chemical pneumonitis. See also section 4.5. | | | | | |
| 11.5 | Suspected Carcinogen: | NA | | | | | |
| 11.6 | Reproductive Toxicity: | This product is not reported to cause 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 is not reported to cause reproductive effects in humans. | | | | | |
| | | The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) upon prolonged or repeated exposure. | | | | | |

## 11. TOXICOLOGICAL INFORMATION – cont'd

| | | |
|---|---|---|
| 11.7 | Irritancy of Product: | See Section 4.2 |
| 11.8 | Biological Exposure Indices: | NE |
| 11.9 | Physician Recommendations: | Treat symptomatically. |

## 12. ECOLOGICAL INFORMATION

| | | |
|---|---|---|
| 12.1 | Environmental Stability: | When released into the soil, this product may leach into groundwater. When released to water, acidity may be readily reduced by natural water hardness minerals. The phosphate may persist indefinitely. |
| 12.2 | Effects on Plants & Animals: | There are no specific data available for this product. |
| 12.3 | Effects on Aquatic Life: | Components of this product are hazardous to aquatic life. Because of the low pH of this product, it is expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems. Phosphoric Acid: $EC_{50}$ (Daphnia Magna, 12h) = 4.6 mg/L |

## 13. DISPOSAL CONSIDERATIONS

| | | |
|---|---|---|
| 13.1 | Waste Disposal: | Review current local, state and federal laws, codes, statutes and regulations to determine current status and appropriate disposal method for the ingredients listed in Section 2. Any disposal practice must be in compliance with local, state, and federal laws and regulations. Contact the appropriate agency for specific information. Treatment, transport, storage and disposal of hazardous waste must be provided by a licensed facility or waste hauler. |
| 13.2 | Special Considerations: | U.S. EPA Hazardous Waste – Characteristic - Corrosive (D002), Characteristic - Toxic (D010) |

## 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): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 1.0 L) |
| 14.2 | IATA (AIR): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 0.1 L) |
| 14.3 | IMDG (OCN): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 1.0 L) |
| 14.4 | TDGR (Canadian GND): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 1.0 L) |
| 14.5 | ADR/RID (EU): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 1.0 L) |
| 14.6 | SCT (MEXICO): | UN3264, LIQUIDOS, CORROSIVOS, ACIDO, INORGANICO, N.E.P. (ACIDO FOSFORICO, ÁCIDO NÍTRICO), 8, II, (CANTIDAD LIMITADA, IP VOL ≤ 1.0 L) |
| 14.7 | ADGR (AUS): | UN3264, CORROSIVE LIQUIDS, ACIDIC, INORGANIC, N.O.S. (PHOSPHORIC ACID, NITRIC ACID), 8, II, (LTD QTY, IP VOL ≤ 1.0 L) |


## 15. REGULATORY INFORMATION

| | | |
|---|---|---|
| 15.1 | SARA Reporting Requirements: | This product contains Nitric Acid and Phosphoric Acid, substances subject to SARA Title III, Section 313 reporting requirements. |
| 15.2 | SARA TPQ: | 302 TPQ (Nitric Acid): 1,000 lbs (454 kg) |
| 15.3 | TSCA Inventory Status: | The components of this product are listed on the TSCA Inventory. |
| 15.4 | CERCLA Reportable Quantity: | Nitric Acid: 1,000 lbs (454 kg); Phosphoric Acid: 5,000 lbs (2,270 kg) |
| 15.5 | Other Federal Requirements: | NA |
| 15.6 | Other Canadian Regulations: | This product has been classified according to the hazard criteria of the CPR and the MSDS 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 Class E (Corrosive Material). WHMIS Class D1 (Materials Causing Immediate and Serious Toxic Effects). |
| 15.7 | State Regulatory Information: | Nitric Acid is found on the following state criteria lists: FL, MA, MN, New Jersey Right-to-Know List (NJ), PA, and Washington Permissible Exposures List (WA).<br>Phosphoric Acid is found on the following state criteria lists: FL, MA, MN, PA<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), 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: | This product does not contain any chemicals known to the State of California to cause cancer or other reproductive harm. For more information go to www.P65Warnings.ca.gov |

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| 16.1 | Other Information: | **DANGER! CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.** Keep only in original packaging. Wash thoroughly with soap and water after handling. Do not eat drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/ eye and face protection. IF INHALED: Remove person to fresh air at once and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. Specific treatments see this container label. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Absorbs spillage to prevent material-damage. Store in a well ventilated place. Keep container tightly closed. Store locked up. **KEEP LOCKED UP AND 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 & Birchwood Technologies' 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: | **Birchwood Technologies**<br>7900 Fuller Road<br>Eden Prairie, MN 55344 USA<br>Tel: +1 (952) 937-7900<br>Fax: +1 (952) 937-7979<br>http://www.birchwoodtechnologies.com |
| 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 |
| **RTECS No.** | Registry of Toxic Effects of Chemical Substances Number |
| **EINECS No.** | European Inventory of Existing Commercial Chemical Substances Number |

### EXPOSURE LIMITS IN AIR:

| | |
|---|---|
| **ACGIH** | American Conference on Governmental Industrial Hygienists |
| **IDLH** | Immediately Dangerous to Life and Health |
| **NOHSC** | National Occupational Health and Safety Commission (Australia) |
| **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. |

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

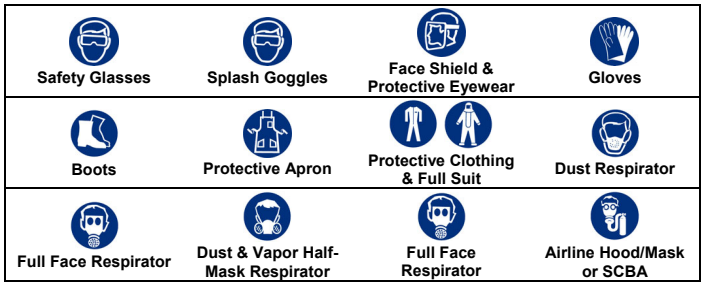
### HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

| | |
|---|---|
| **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:

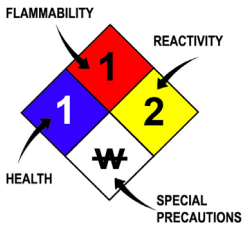
| | |
|---|---|
| **Carc** | Carcinogenic |
| **Irrit** | Irritant |
| **NA** | Not Available |
| **NR** | No Results |
| **ND** | Not Determined |
| **NE** | Not Established |
| **NF** | Not Found |
| **SCBA** | Self-Contained Breathing Apparatus |
| **Sens** | Sensitization |
| **STOT RE** | Specific Target Organ Toxicity – Repeat Exposure |
| **STOT SE** | Specific Target Organ Toxicity – Single Exposure |

### 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 |



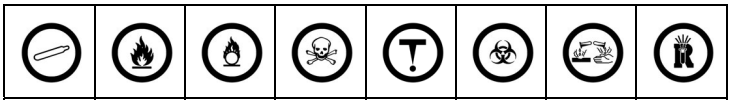

### TOXICOLOGICAL INFORMATION:

| | |
|---|---|
| **$LD_{50}$** | 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:

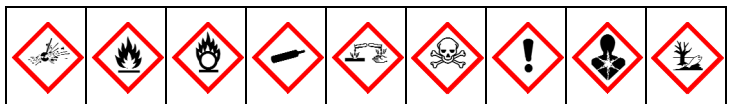
| | |
|---|---|
| **WHMIS** | Canadian Workplace Hazardous Material Information System |
| **DOT** | U.S. Department of Transportation |
| **TC** | Transport Canada |
| **EPA** | U.S. Environmental Protection Agency |
| **DSL** | Canadian Domestic Substance List |
| **NDSL** | Canadian Non-Domestic Substance 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) |

### 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 |

### 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 |