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# SAFETY DATA SHEET



This Safety Data Sheet (SDS) complies with the requirements of the U.S. Federal Occupational Safety and Health Administration Hazard Communication Standard (29 CFR 1910.1200, as updated in 2012) and equivalent state Standards. It has also been developed in accordance with the United Nations Globally Harmonized System of Classification of Chemicals (GHS), and the Canadian Workplace Hazardous Materials Information System (WHMIS). Refer to Section 16 of this document for the definition of terms and abbreviations.

## SECTION 1: IDENTIFICATION of the Substance/Mixture and of the Company/Undertaking

### 1.1 PRODUCT IDENTIFIER:

- PRODUCT NAME: **Ag-Cu-Zn Solder/Alloy Product Line**
  - Silver Solder
  - Yellow Master Alloy
  - Green Master Alloy
- PRODUCT CODES: No.54.701, No. 54.702, No. 54.703

ALLOY	5, 10, 20, 50, 71, 121, 201, 204, 205, 208, 209, 210, 214, 218, 219, 220, 222, 227, 234, 235, 236, 248, 250, 251, 255, 257, 260, 261, 265, 305, 332, 340, 351, 355, 356, 360, 361, 381, 382, 405, 503, 504, 506, 701, 705, 713, 722, 750, 764, 771, 780, 781, 783, 799
SILVER SOLDER	SS 45-2, SS 65, SS 70, SS 75, IT

### 1.2 RELEVANT IDENTIFIED USES OF THE MIXTURE OR USES ADVISED AGAINST

- IDENTIFIED USE: Silver Solder or Master Alloy
- USES ADVISED AGAINST: None Specified

### 1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

- MANUFACTURER/SUPPLIER: **KROHN INDUSTRIES, INC.**
- ADDRESS: 303 Veterans Blvd.; Carlstadt, NJ; 07072
- BUSINESS PHONE: 201-933-9696
- EMERGENCY PHONE: 1-800-255-3924(CHEMTEL; 24 hours)

### 1.4 OTHER PERTINENT INFORMATION

- This product is used for used as a solder or a master alloy for gold; it has limited hazards except when heated to the point fumes are emitted. All pertinent hazards related to alloying metals and soldering are provided in the pertinent sections of this document (i.e. sections 7, 8, and 11).

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

REGULATION	CLASSIFICATION
US OSHA HCS CANADA WHMIS	Not classified as hazardous.

- LABEL ELEMENTS:** BASED ON GLOBALLY HARMONIZED SYSTEM

Symbol: Not applicable.  
 Signal Word: Not applicable.  
 Hazard statement(s): Not applicable.  
 Precautionary statement(s): Not applicable.

## SECTION 2: HAZARDS IDENTIFICATION (Continued)

### 2.2 OTHER PERTINENT DATA ON CHEMICAL AND PHYSICAL HAZARDS:

#### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

Health	0	HMIS Personal Protective Equipment Rating: Occupational use (i.e. soldering): B/C; Safety glasses and gloves/ body protection suitable to specific circumstances of use should be considered. *Respiratory irritation.
Flammability	0	
Physical Hazard	0	
Protective Equipment	B/C	

#### CANADIAN REGULATORY STATUS

- o WHMIS 2015: See Previous Section.
- o This SDS contains all the information required by the Hazardous Products Regulations.

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1 SUBSTANCES/MIXTURES

COMPONENT	CAS NUMBER	GHS HAZARD CLASSIFICATION	% (w/w)
Silver	7440-22-4	In this form: Not classified has hazardous.	5-85%
Zinc	7440-66-6	In this form: Not classified has hazardous.	0.2-30%
Copper	7440-50-8	In this form: Not classified has hazardous.	Balance

## SECTION 4: FIRST AID MEASURES

### 4.1 DESCRIPTION OF FIRST AID MEASURES

The following steps should be taken in the event there is exposure to the dusts or fumes of the product:

**Eyes:** Flush with copious amounts of water for 15 minutes. "Roll" eyes during flush. Seek medical attention if irritation continues. **Skin:** Flush area with warm, running water for 15 minutes. Seek medical attention if irritation persists. **Inhalation:** If dusts of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. **Ingestion:** Contact a Poison Control Center or physician for instructions. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

### 4.2 MOST IMPORTANT ACUTE AND CHRONIC EXPOSURE SYMPTOMS

- o **ACUTE:** The following symptoms may arise in the event there is exposure to dusts or fumes of this product:

#### AREA EXPOSED

<b>Eye Contact</b>	Can causes eye irritation. Can cause pain and redness upon contact; prolonged contact can be damaging though mechanical irritation.
<b>Skin Contact</b>	May cause skin irritation. May cause pain and redness upon contact through mechanical irritation
<b>Inhalation</b>	May cause respiratory tract irritation; symptoms may include coughing and sneezing depending on volume of dusts that are inhaled.
<b>Ingestion</b>	May be harmful if swallowed. Can cause gastrointestinal system irritation; symptoms may include pain, sore throat, nausea and vomiting.
<b>Molten Solder</b>	Contact with molten material can cause thermal burns.

- o **CHRONIC:** See section 11 for information on Metal Fume Fever.
- o **TARGET ORGANS:** Not applicable.

### 4.3 INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

- o **RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate exposure.
- o **MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** None known for product. Inhalation of solder fumes/dusts can aggravate respiratory conditions.

## SECTION 5: FIREFIGHTING MEASURES

### 5.1 EXTINGUISHING MEDIA

- **RECOMMENDED FIRE EXTINGUISHING MEDIA:** Water Spray, Water Jet, Dry Powder, Foam, Carbon Dioxide, or any other.
- **UNSUITABLE FIRE EXTINGUISHING MEDIA:** None known.

### 5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

- **NFPA FLAMMABILITY CLASSIFICATION:** Not flammable.
- **UNUSUAL HAZARDS IN FIRE SITUATIONS:** This product is non-combustible. This product does not significantly contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.
  - Sensitivity to Mechanical Impact: Not sensitive.
  - Explosion Sensitivity to Static Discharge: Not sensitive.



### 5.3 ADVICE FOR FIREFIGHTERS

- Wear Self Contained Breathing Apparatus and full protective equipment for fire response. Move containers from fire area if it can be done without risk to personnel. Otherwise, use water spray to keep fire-exposed containers cool. Contaminated equipment should be rinsed thoroughly with water before returning to service.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES

- **RESPONSE TO INCIDENTAL RELEASES:** Personnel who have received basic chemical safety training can generally handle small-scale releases (e.g., under 1 kg). For small releases, the minimum Personal Protective Equipment should be rubber gloves and splash goggles/safety glasses (in the event there are dusts generated). Use caution during clean-up; avoid stepping into spilled solid or clean-up procedures that generate substantial amounts of dust.
- **RESPONSE TO NON-INCIDENTAL RELEASES:** For large-scale releases of this product, minimum Personal Protective Equipment should be Level C: triple-gloves, chemical resistant apron, boots, and splash goggles and air purifying respirator equipped with a high-efficiency particulate filter.
- **RESPONSE PROCEDURES FOR ANY RELEASE:** Wipe up solid residue with damp polypads or sponge. Rinse area with soap/water solution followed by a water rinse. Alternatively, use a HEPA (high efficiency particle air) vacuum to collect material and place in a sealable container for disposal.

### 6.2 ENVIRONMENTAL PRECAUTIONS

- Avoid response actions that can cause a release of a significant amount of the substance into the environment.

### 6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

- **SPILL RESPONSE EQUIPMENT:** Polypad/sponge or HEPA vacuum.

### 6.4 REFERENCES TO OTHER SECTIONS

- **SECTION 8:** For exposure levels and detailed personal protective equipment recommendations.
- **SECTION 13:** For waste handling guidelines.

## SECTION 7: HANDLING AND STORAGE

### 7.1 PRECAUTIONS FOR SAFE HANDLING

- **HYGIENE PRACTICES:** Keep out of reach of children. Follow good chemical hygiene practices. Do not smoke, drink, eat, or apply cosmetics in the chemical use area. Avoid inhalation of dusts or fumes. Use in well-ventilated area. Avoid contact with skin or eyes. Remove contaminated clothing promptly. Clean up spilled product immediately.
- **HANDLING RECOMMENDATIONS:**
  - **General:** Employees must be appropriately trained to use this product safely as needed. Keep containers closed when not in use.
  - **Soldering Applications:** Any surface that comes in contact with molten metal must be preheated or specially coated and rust free. Keep melting/soldering temperatures as low as possible to minimize the generation of fumes.

### 7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

- **STORAGE RECOMMENDATIONS:** Ensure all containers are correctly labeled. Store containers away from direct sunlight, sources of intense heat, or where freezing is possible. Store this product away from incompatible chemicals (See Section 10, Stability and Reactivity). Empty containers may contain residual material; therefore, empty containers should be handled with care. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 CONTROL PARAMETERS

- **AIRBORNE EXPOSURE LIMITS:** The following exposure limits are applicable to dusts or fumes of the component metals only:

COMPONENT	ACGIH TLV	OSHA PEL	NIOSH REL	OTHER
Copper (Dust)	TWA = 1 mg/m <sup>3</sup>	TWA = 1 mg/m <sup>3</sup>	TWA = 1 mg/m <sup>3</sup>	NE
Copper (Fume)	TWA = 0.2 mg/m <sup>3</sup>	TWA = 0.1 mg/m <sup>3</sup>	TWA = 0.1 mg/m <sup>3</sup>	NE
Silver (Dust and Fume)	TWA = 0.1 mg/m <sup>3</sup>	TWA = 0.01 mg/m <sup>3</sup>	TWA = 0.01 mg/m <sup>3</sup>	NE
Zinc (oxide, fumes)	NE	TWA = 5 mg/m <sup>3</sup>	TWA = 5 mg/m <sup>3</sup> STEL = 10 mg/m <sup>3</sup>	NE

- **BIOLOGICAL OCCUPATIONAL EXPOSURE LIMITS:** There are no Biological Exposure Indices (BEIs) for components of this product.

### 8.2 EXPOSURE CONTROLS

- **ENGINEERING CONTROLS:** Use this product in well-ventilated environment. Safety showers, eye wash stations, and hand-washing equipment should be available.
- **RESPIRATORY PROTECTION:** None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control dusts or fumes. For situations in which significant amounts of dusts or fumes could be generated, wear an air-purifying respirator with a high-efficiency particulate filter.
- **HAND PROTECTION:** Neoprene gloves should be used. If necessary, refer to U.S. OSHA 29 CFR 1910.138, or appropriate state, local, or national standards.
- **EYE PROTECTION:** Splash goggles or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate state, local, or national standards.
- **BODY PROTECTION:** Use a body protection appropriate to task (e.g., lab coat, coveralls, or apron). Care should be taken to select protection for potentially exposed areas when prolonged exposure to fumes or dusts could occur in occupational settings.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

- (a) **APPEARANCE:** Various colors; metal in sheet, wire powder, cut and shot forms.
- (b) **ODOR:** Odorless.
- (c) **ODOR THRESHOLD:** Not applicable.
- (d) **pH:** Not applicable.
- (e) **MELTING POINT/FREEZING POINT:** For copper - 1083 °C (1981.4 °F). For silver - 961 °C (2212 °F).
- (f) **INITIAL BOILING POINT AND BOILING RANGE:** Not applicable.
- (g) **FLASH POINT:** Not applicable.
- (h) **EVAPORATION RATE (water=1):** Not applicable.
- (i) **FLAMMABILITY:** Not flammable.
- (j) **UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:** Not applicable.
- (k) **VAPOR PRESSURE (mmHg @ 20°C):** Not applicable.
- (l) **VAPOR DENSITY:** Not applicable.
- (m) **RELATIVE DENSITY (water=1):** For copper - 8.96.  
For silver - 10.49.
- (n) **SOLUBILITY:** Insoluble.
- (o) **PARTITION COEFFICIENT: N-OCTANOL/WATER:** Not determined.
- (p) **AUTO-IGNITION TEMPERATURE:** Not applicable.
- (q) **DECOMPOSITION TEMPERATURE:** Not determined.
- (r) **VISCOSITY:** Not applicable.
- (s) **EXPLOSIVE PROPERTIES:** Not applicable.
- (t) **OXIDIZING PROPERTIES:** Not an oxidizer.

### 9.2 OTHER INFORMATION

- **VOC (less water & exempt):** Not applicable.

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 REACTIVITY

- Not reactive under typical conditions of use or handling.

### 10.2 CHEMICAL STABILITY

- Normally stable under standard temperatures and pressures.

### 10.3 POSSIBILITY OF HAZARDOUS REACTIONS

- This product is not self-reactive or air-reactive. This product will not undergo hazardous polymerization.

### 10.4 CONDITIONS TO AVOID

- Avoid contact with incompatible chemicals.

### 10.5 INCOMPATIBLE MATERIALS

- This product is not compatible with strong oxidizing agents, strong acids, strong bases, amines, combustible material, and peroxides.

### 10.6 HAZARDOUS DECOMPOSITION PRODUCTS

- Heating of this product can release silver, copper and zinc oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

- **ACUTE TOXICITY:**
  - **PRODUCT ESTIMATED TOXICITY:**
    - Acute Toxicity Estimate (Oral) > 2000 mg/kg
    - Acute Toxicity Estimate (Dermal) > 5000 mg/kg
  - **TOXICOLOGY DATA:** The following data are available for hazardous components in this product greater than 1% in concentration

**COPPER METAL**  
Oral-Rat LD50 > 5000 mg/kg  
Dermal-Rabbit > 2000 mg/kg

**SILVER METAL**  
Oral-Rat LD50 > 5000 mg/kg  
Dermal-Rabbit > 2000 mg/kg

**ZINC METAL**  
Oral - Rat - LD50 = 630 mg/kg

## SECTION 11: TOXICOLOGICAL INFORMATION

- **DEGREE OF IRRITATION:** Contact with fumes and dusts can be irritating to the eyes and skin.
  - **SENSITIZATION:** Not reported to have skin or respiratory sensitization effects.
  - **REVIEW OF ACUTE SYMPTOMS AND EFFECTS:** See Section 2 (Hazards Information) and Section 4 (First-Aid Measures) for further details.
    - **EYES:** Contact with dusts/fumes can cause irritation.
    - **SKIN:** Contact with dusts/fumes can cause irritation.
    - **INHALATION:** Dusts and fumes of this product can cause mild to severe nasal irritation.
    - **INGESTION:** Although not anticipated to be a significant route of occupational over-exposures, ingestion of this product may irritate the mouth, throat, and other contaminated tissue and cause other adverse health effects.
    - **MOLTEN MATERIAL CONTACT:** Can cause thermal burns.
  - **METAL FUME FEVER** Acute overexposure to product fumes result in metal fume fever, which causes symptoms such as sweet metal taste, dry throat, coughing, fever and chills, tight chest, dyspnea, headache, blurred vision, back pain, nausea, vomiting, fatigue. Symptoms usually disappear within 24 hours. Copper may cause skin and hair discoloration. Inhalation of copper dusts may change the gums and mucous lining of
  - **CHRONIC TOXICITY:**
    - **CARCINOGENICITY STATUS:** The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.
- | CHEMICAL                 | IARC | NTP | NIOSH | OSHA | OTHER   |
|--------------------------|------|-----|-------|------|---|
| Copper (Dusts and Fumes) | NO   | NO  | NO    | NO   | EPA D: Not classifiable as to human carcinogenicity                     |
| Silver (Dusts and Fumes) | NO   | NO  | NO    | NO   | EPA D: Not classifiable as to human carcinogenicity                     |
| Zinc                     | NO   | NO  | NO    | NO   | EPA DII: Not classifiable as to human carcinogenicity; inadequate data. |
- **REPRODUCTIVE TOXICITY INFORMATION:** The components of this product are not reported to cause reproductive effects under typical circumstances of exposure at the concentrations present in this product.
  - **MUTAGENIC EFFECTS:** The components of this product are not reported to cause reproductive effects under typical circumstances of exposure at the concentrations present in this product.
  - **SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE:** Not applicable.
  - **SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE:** Not applicable.
  - **ASPIRATION HAZARD:** Not applicable.
- **OTHER INFORMATION**
    - **TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None known.
    - **ADDITIONAL TOXICOLOGY:** None known.

## SECTION 12: ECOLOGICAL INFORMATION

- 12.1 **TOXICITY**
  - Alloys of silver, copper and zinc present no threat to the environment when they occur in the size and form associated with this product. In ionic form, silver compounds can be highly toxic to the aquatic environment.
- 12.2 **PERSISTENCE AND DEGRADABILITY**
  - Silver, copper and zinc occur naturally in the environment. It is anticipated that they will slowly react with water, salts, and other compounds found naturally in the environment over prolonged periods of time.
- 12.3 **BIOACCUMULATIVE POTENTIAL**
  - The components of this product are not anticipated to bioaccumulate in any significant quantities.
- 12.4 **MOBILITY IN SOIL**

- Alloys in the product's form are not mobile in the environment.

## SECTION 13: DISPOSAL CONSIDERATION

### 13.1 WASTE TREATMENT METHODS

- WASTE HANDLING RECOMMENDATIONS:** Prepare, transport, treat, store, and dispose of waste product according to all applicable local, U.S. State and U.S. Federal regulations, or the applicable Canadian standards.
- METAL RECLAMATION:** When applicable and practical, users of the product may wish to utilize metal reclamation services for final disposition of wastes.

### 13.2 DISPOSAL CONSIDERATIONS

- EPA RCRA WASTE CODE:** D011 (Silver); Applicable to wastes consisting only of this product.

## SECTION 14: TRANSPORT INFORMATION

### 14.1 TRANSPORTATION REGULATIONS

- DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS SHIPPING REGULATIONS:**

UN/NA Number	Proper Shipping Name	Packing Group	Hazard Class	Label	North American Emergency Response Guide #	Marine Pollutant Status
NOT APPLICABLE						

- CANADIAN TRANSPORTATION INFORMATION:** This product is not regulated by Transport Canada as dangerous goods under Canadian transportation standards. Refer to above information.
- IATA DESIGNATION:** This product is not regulated as dangerous goods by the International Air Transport Association.
- IMO DESIGNATION:** This product is not regulated as dangerous goods by the International Maritime Organization.

### 14.2 ENVIRONMENTAL HAZARDS

- None described, as related to transportation.

### 14.3 SPECIAL PRECAUTIONS FOR USERS

- Not applicable.

### 14.4 TRANSPORT IN BULK

- Not applicable.

## SECTION 15: REGULATORY INFORMATION

### 15.1: SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR PRODUCT

- OTHER IMPORTANT U.S. REGULATIONS**

- **U.S. SARA THRESHOLD PLANNING QUANTITY:** Not applicable.
- **U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21):** Not applicable.
- **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Not applicable. For metals listed under CERCLA (i.e., silver, copper and zinc), no reporting of releases of the solid form is required if the mean diameter of the pieces of the solid metal released is greater than 100 micrometers (0.004 inches).
- **U.S. TSCA INVENTORY STATUS:** All components of this product are listed on the TSCA Inventory.
- **US SARA 313:** Silver and copper are subject to the SARA 313 reporting requirements.
- **CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) STATUS:** Not applicable.

## SECTION 15: REGULATORY INFORMATION (Continued)

### • INTERNATIONAL REGULATIONS

- **CANADIAN DSL/NDSL INVENTORY STATUS:** The listed components of this product are on the DSL/NDSL Inventory.
- **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS:** The components of this product are not on the CEPA Priority Substances Lists.

### 15.2: CHEMICAL SAFETY ASSESSMENT.

- No information available.

## SECTION 16: OTHER INFORMATION

### 16.1 INDICATION OF CHANGE.

- **ORIGINAL DATE OF ISSUE:** September 29, 2018
- **SUPERCEDES:** Not applicable.
- **CHANGE INDICATED:** Not applicable.

### 16.2 KEY LITERATURE REFERENCES AND SOURCES FOR DATA

- SAFETY DATA SHEETS FOR COMPONENT PRODUCTS.
- Federal OSHA Hazard Communication Standard: 29 CFR 1910.1200
- TOXNET – <http://toxnet.nlm.nih.gov/>

### 16.3 CLASSIFICATION AND PROCEDURE USED TO DERIVE THE CLASSIFICATIONS FOR MIXTURES

- **CLASSIFICATION:** Section 2 (Hazards Information) provides all relevant classification information used for this product. The assignments were based on data available for the component products, calculations, expert judgment, and weight of evidence.

### 16.4 WARRANTY AND COPYRIGHT

- **WARRANTY:** The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Krohn Industries assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Krohn Industries assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.
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## SECTION 16: OTHER INFORMATION (Continued)

### 16.5 ABBREVIATIONS AND ACRONYMS.

**ALL SECTIONS:** **OSHA:** U.S. Federal Occupational Safety and Health Administration. **WHMIS:** Canadian Workplace Hazardous Materials Standard. **GHS:** Globally Harmonized System of Classification of Chemical Substances

**SECTION 2: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING:** This is a rating system used by industry to summarize physical and health hazards to chemical users and was originally developed by the National Paint and Coating Association. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

**SECTION 3: CAS Number:** Chemical Abstract Service Number, which is used by the American chemical Society to uniquely identify a chemical.

**SECTION 5: NFPA:** National Fire Protection Association. **NFPA FLAMMABILITY CLASSIFICATION:** The NFPA uses the flash point (F.P.) and boiling point (BP) to classify flammable or combustible liquids. Class IA: F.P. below 73°F and BP below 100°F. Class IB: F.P. below 73°F and BP at or above 100°F. Class IC: F.P. at or above 73°F and BP at or above 100°F. Class II: F.P. at or above 100°F and below 140°F. Class IIIA: F.P. at or above 140°F and below 200°F. Class IIIB: F.P. at or above 200°F. **NFPA HAZARDOUS MATERIALS RATING:** This is a rating system used to summarize physical and health hazards to firefighters. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

**SECTION 8: NE:** Not established. **ACGIH:** American Conference of Government Industrial Hygienists; **TWA:** Time-Weighted Average (over an 8-hour work day); **STEL:** Short-Term Exposure Limit (15-minute average, no more than 4-times daily and each exposure separated by one-hour minimally); **C:** Ceiling Limit (concentration not to be exceeded in a work environment). **PEL:** Permissible Exposure Limit. **NIOSH:** National Institute of Occupational Safety and Health; **REL:** Recommended Exposure Limit; **IDLH:** Immediately Dangerous to Life and Health Concentrations. *Note:* In July 1992, a court ruling vacated the more protective PELs set by OSHA in 1989. Because OSHA may enforce the more protective levels under the "general duty clause", both the current and vacated levels are presented in this document. **ppm:** Parts per Million. **mg/m<sup>3</sup>:** Milligrams per cubic meter. **mppcf:** Millions of Particles per Cubic Foot. **BEI:** Biological Exposure Limit.

**SECTION 9: pH:** Scale (0 to 14) used to rate the acidity or alkalinity of aqueous solutions. For example, a pH value of 0 indicates a strongly acidic solution, pH of 7 indicates a neutral solution, and a pH value of 14 indicates an extremely basic solution. **FLASH POINT:** Temperature at which a liquid generates enough flammable vapors so that ignition may occur. **AUTOIGNITION TEMPERATURE:** Temperature at which spontaneous ignition occurs. **LOWER EXPLOSIVE LIMIT (LEL):** The minimal concentration of flammable vapors in air which will sustain ignition. **UPPER EXPLOSIVE LIMIT (UEL):** The maximum concentration of flammable vapors in air which will sustain ignition. ≈: Approximately symbol.

**SECTION 11: CARCINOGENICITY STATUS:** **NTP:** National Toxicology Program. **IARC:** International Agency for Research on Cancer. **REPRODUCTIVE TOXICITY INFORMATION:** **Mutagen:** Substance capable of causing chromosomal damage to cells. **Embryotoxin:** Substance capable of damaging the developing embryo in an overexposed female. **Teratogen:** Substance capable of damaging the developing fetus in an overexposed female. **Reproductive toxin:** Substance capable of adversely affecting male or female reproductive organs or functions. **TOXICOLOGY DATA:** **LDxx or LCxx:** The Lethal Dose or Lethal Concentration of a substance which will be fatal to a given percentage (xx) of exposed test animals by the designate route of administration. This value is used to assess the toxicity of chemical substances to humans. **TDxx or TCxx:** The Toxic Dose or Toxic Concentration of a substance which will cause an adverse effect to a given percentage (xx) of exposed test animals by the designate route of administration.

**SECTION 12: T<sub>lm</sub> – Median Tolerance Limit**

**SECTION 13: RCRA:** Resource Conservation and Recovery Act. The regulations promulgated under this Act are found in 40 CFR, Sections 260 ff, and define the requirements of hazardous waste generation, transport, treatment, storage, and disposal. **EPA RCRA Waste Codes:** Defined in 40 CFR Section 261.

**SECTION 15: CERCLA:** Comprehensive Environmental Response Compensation and Liability Act (a.k.a. "Superfund") and SARA: (Superfund Amendment and Reauthorization Act). The regulations promulgated under this Act are located under 40 CFR 300 ff, and provide "community right-to-know" requirements. **DSL/NDL:** Canadian Domestic Substances and Non-Domestic Substances Lists.