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GRAPHIC CHEMICAL

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* ZINC ETCHING PLATES *

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MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION:

<u>TRADE NAME (AS LABELED):</u>	ALFA ZINC TRIPLEMETAL
<u>CHEMICAL NAME/CLASS:</u>	METAL ALLOY
<u>PRODUCT USE:</u>	Printing Operations
<u>MANUFACTURER'S NAME:</u>	REVERE GRAPHICS WORLDWIDE
<u>ADDRESS:</u>	5 Boundary Street Plymouth, MA 02360
<u>EMERGENCY PHONE:</u>	(800) 424-9300 (CHEMTREC)
<u>BUSINESS PHONE:</u>	(508) 746-1000
<u>DATE OF PREPARATION:</u>	May 27, 1995
<u>DATE OF FIRST REVISION:</u>	July 8, 1998

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR BASED ON 8 HOUR TIME-WEIGHTED AVERAGES UNLESS OTHERWISE STATED					
			ACGIH		OSHA		IDLH mg/m ³	OTHER mg/m ³
			TLV mg/m ³	STEL mg/m ³	PEL mg/m ³	STEL mg/m ³		
Zinc The following exposure limits are for Zinc Oxide, Dust or Fume (as indicated)	7440-66-6	> 99.0	DUST: 10 FUME: 5	FUME: 10	DUST: 15 (total dust); 5 (respirable fraction) FUME: 5	NE	500	NIOSH REL: DUST: 5 (TWA); 15 (C) FUME: 5 (TWA); 10 (STEL)
Photoactive Monomer	NE	< 1.0	NE	NE	NE	NE	NE	NE
Other ingredients present in less than 1% concentration (or 0.1 % for carcinogens, reproductive toxins, and respiratory sensitizers)		Balance	None of these ingredients has established exposure limits or contributes additional significant hazards. All pertinent hazard information has been presented in the appropriate sections of this document.					
This product has polyethylene film on one side and paint on the other. See Section 7 for handling information.			The information presented in this MSDS is not applicable to these coatings unless otherwise specified.					

V-1936

NE = Not Established C = Ceiling Limit See Section 10 for Definitions of Terms Used
 NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

ALFA ZINC TRIPLEMETAL MSDS

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a solid, odorless, zinc alloy plate, which has polyethylene film on one side and paint on the other. There are no immediate health hazards associated with this product. This product is not reactive. If involved in a fire, this product may generate irritating zinc fumes and metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of over-exposure for this product are by skin or eye contact. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: Inhalation is not anticipated to be a significant route of overexposure to the plates. Inhalation of large amounts of particulates generated by this product during metal processing operations may be physically irritating and cause deposits of dust in nasal passages. Inhalation of dusts and fumes of Zinc (a component of this product) can cause metal fume fever. Initial symptoms of metal fume fever can include a metallic or sweet taste in the mouth, dryness or irritation of the throat, and coughing. Later symptoms (after 4-48 hours) can include sweating, shivering, headache, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, and tiredness.

CONTACT WITH SKIN or EYES: Contact of the plate form of this product with the skin is not anticipated to be irritating. Contact with the plate form of this product or metal dust generated during routing can be physically damaging and irritating to the eye (i.e., foreign object).

SKIN ABSORPTION: Skin absorption is not known to be a significant route of over-exposure for any component of this product.

INGESTION: Ingestion is not anticipated to be a likely route of occupational exposure for this product. If particulates, generated during routing operations, are ingested (i.e., through poor hygiene practices), nausea, vomiting, diarrhea, and abdominal cramps can occur.

INJECTION: Injection of this product is not anticipated to be a significant route of exposure.

TARGET ORGANS: None under normal circumstances of use and handling. Skin, eyes, and respiratory system in situations in which fumes or dusts are generated.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure from this product is very unlikely when used for its designed purpose.

ACUTE: Inhalation of large amounts of particulates generated by this product during metal processing operations may result in irritation. Inhalation of dusts and fumes of Zinc (a component of this product) can cause metal fume fever. Contact with the plate form of this product or metal dust generated during routing can be physically damaging and irritating to the eye (i.e., foreign object).



CHRONIC: There are currently no adverse health effects reported for chronic exposures to the product.

PART II What should I do if a hazardous situation occurs?

4. FIRST AID MEASURES

SKIN EXPOSURE: In the event that skin contact leads to irritation, rinse the area thoroughly with water. The contaminated individuals must seek medical attention if any adverse effect persists.

EYE EXPOSURE: If particulates generated by this product during metal processing operations enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	0
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

See Section 16 for Definition of Ratings

ALFA ZINC TRIPLE METAL MESH

4. FIRST-AID MEASURES

INHALATION: If particulates generated by this product during metal processing operations are inhaled, remove victim to fresh air. Seek medical attention if any adverse effect occurs after overexposure.

INGESTION: If particulates generated by this product during metal processing operations are swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with victim.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

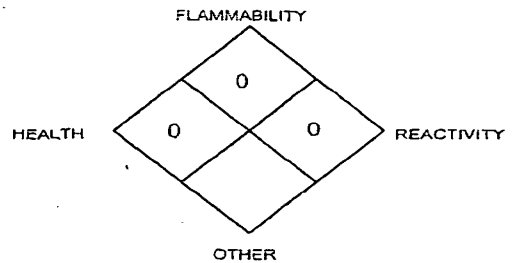
AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower: Not applicable.
Upper: Not applicable.

FIRE EXTINGUISHING MATERIALS: In the unlikely event that finely-divided zinc ignites, water and ordinary extinguishers such as CO₂ or halon *should not* be used. Use G-1 powder or powdered talc. Otherwise, this product is not normally ignitable and personnel should use fire extinguishing materials appropriate for surrounding fire.

- | | |
|-------------------------|-------------------------------|
| Water Spray: Yes | Carbon Dioxide: Yes |
| Foam: Yes | Dry Chemical: Yes |
| Halon: Yes | Other: Any "ABC" Class |

NFPA RATING



See Section 16 for Definition of Ratings

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this product may decompose and produce irritating fumes and toxic gases including metal oxides, metal fumes, carbon monoxide, and carbon dioxide (from polyethylene film and paint). Use of water on molten zinc will produce hydrogen gas and may cause an explosion.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Zinc powder or dust may be sensitive to static discharge.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used. If necessary, clear the affected area and protect people. In the event of a non-incident release of dusts, minimum Personal Protective Equipment should be gloves, goggles, and appropriate body protection. Level B, which includes the use of Self-Contained Breathing Apparatus, should be worn when oxygen levels are below 19.5% or are unknown. Pick-up or sweep-up product carefully. Decontaminate the area thoroughly. Place all spill residue in a suitable container and seal if appropriate. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, or the appropriate standards of Canada and its Provinces (see Section 13, Disposal Considerations).

PART III How can I prevent hazardous situations from occurring?

7. HANDLING and STORAGE

WORK AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after using this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts of this product. If necessary, periodically wipe-down area of product use to prevent accumulation of dusts. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this product should be trained to handle it safely. Avoid breathing particulates generated by this product during metal processing or other operations. Use in a well-ventilated location. Packages of this product must be properly labeled.

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7. HANDLING and STORAGE (continued)

STORAGE AND HANDLING PRACTICES (continued): No special precautions are necessary when handling these plates, except to protect the surfaces from mechanical damage. **Avoid accumulation of shavings or powder produced when working with these plates.** Finely divided zinc dust may present a fire and explosion hazard. When removing the polyethylene film, dispose of the plastic properly; it is a low hazard material. If removing the paint coating, use procedures designed to prevent exposure to paint pigments and potentially hazardous components used in the removal process.

Store packages in a cool, dry location. Storage in an atmosphere that is wet, moist, or highly humid may lead to corrosion of this product. Store away from incompatible materials (see Section 10, Stability and Reactivity)

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or those of Canada and its Provinces.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Prudent practice is to ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed, use only protection authorized in 29 CFR 1910.134 or applicable State regulations. Use supplied air respiration protection if oxygen levels are below 19.5% or are unknown.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: Wear neoprene gloves for routine industrial use.

BODY PROTECTION: Wear body protection appropriate for task (e.g., apron, lab coat, coveralls).

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY (air = 1): Not applicable.

SPECIFIC GRAVITY (water = 1): 7.14

SOLUBILITY IN WATER: Insoluble.

VAPOR PRESSURE, mm Hg @20°C: Not applicable.

ODOR THRESHOLD (recognition): Not applicable.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not applicable.

APPEARANCE AND COLOR: Flat, shiny, blue-gray plate with a black plastic film and pigmented coating on one surface and a green paint on the other.

HOW TO DETECT THIS SUBSTANCE (warning properties): The plate shape is characteristic.

EVAPORATION RATE (n-BuAc=1): Not applicable.

MELTING POINT or RANGE: 419°C (786°F)

BOILING POINT: Not applicable.

pH: Not applicable.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Zinc metal oxides, metal fumes, carbon monoxide, and carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, strong caustics, strong oxidizers.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Fire, extremely high temperatures, contact with incompatible materials.

PART IV Is there any other useful information about this material?**11. TOXICOLOGICAL INFORMATION**

TOXICITY DATA: The specific toxicology data available for components greater than 1% in concentration are as follows.

ZINC:

Skin Irritancy (human) = 300 mg/3 days/ Intermittent; mild

TCLo (Inhalation, human) = 124 mg/m³/50 minutes; pulmonary system effects, skin

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11. TOXICOLOGICAL INFORMATION

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product's particulates may be slightly irritating to contaminated skin and eyes.

SENSITIZATION TO THE PRODUCT: The components of this product are not known to be sensitizers with repeated or prolonged use.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

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.

A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders may be aggravated by prolonged over-exposures to the particulates generated by this product during metal processing operations.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

BIOLOGICAL EXPOSURE INDICES: Currently, there are no Biological Exposure Indices (BEIs) associated with the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The metal components of this product occur naturally in the environment and are expected to persist in the environment for an extended period of time. The other components of this product will degrade slowly over time in the environment. Additional environmental data are available for components, as follows:

ZINC: Insoluble in water. Biological Half-Life for humans 162-500 days. The Bioconcentration Factor in edible portions of *Crassostrea virginica*, adult oyster) is 16,700 (total zinc).

EFFECT OF MATERIAL ON PLANTS or ANIMALS: The metal components of this product occur naturally in the environment and are essential for plant and animal life. This product is not expected to cause adverse effects on plant or animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product is not expected to cause adverse effects on aquatic life. Additional data are available for components, as follows:

ZINC: Zinc poisoning causes inflamed gills in fish. Laboratory studies of Atlantic salmon, rainbow trout, carp, and goldfish have shown avoidance reactions by these fish to zinc in water. The sensitivity of fish to zinc varies with species, age, and the condition of fish, as well as the characteristics of the water. Some acclimatization to the presence of zinc is possible, and survivors from batches of fish exposed to dissolved zinc are less susceptible to additional toxic concentrations than fish not previously exposed. It has also been observed that the effects of zinc poisoning may not become apparent immediately, so that fish removed from zinc-contaminated to zinc-free water (after 4-6 hour exposure) may die within 48 hours.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, or those of Canada and its Provinces. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local solid waste regulatory authority.

EPA WASTE NUMBER: Not applicable to wastes consisting only of this product.

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14. TRANSPORTATION INFORMATION

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not Applicable
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable
DOT LABEL(S) REQUIRED: Not Applicable
EMERGENCY RESPONSE GUIDE NUMBER: Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER; 1996: Not applicable.
MARINE POLLUTANT: No component of this product is designated as a marine pollutant by the Department of Transportation (49 CFR 172.101, Appendix B).
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS PRODUCT IS NOT CONSIDERED AS DANGEROUS GOODS.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Zinc (fume or dust)	No	Yes	Yes

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Zinc = 1000 lb. RQ for Zinc is applicable to particles 100 micrometers or less in diameter.
U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: None.	Michigan - Critical Materials Register: Zinc.	Pennsylvania - Hazardous Substance List: Zinc.
California - Permissible Exposure Limits for Chemical Contaminants: None.	Minnesota - List of Hazardous Substances: None.	Rhode Island - Hazardous Substance List: Zinc.
Florida - Substance List: Zinc.	Missouri - Employer Information/Toxic Substance List: None.	Texas - Hazardous Substance List: None.
Illinois - Toxic Substance List: Zinc.	New Jersey - Right to Know Hazardous Substance List: Zinc.	West Virginia - Hazardous Substance List: None.
Kansas - Section 302/313 List: Zinc.	North Dakota - List of Hazardous Chemicals, Reportable Quantities: Zinc.	Wisconsin - Toxic and Hazardous Substances: None.
Massachusetts - Substance List: Zinc.		

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): None of the components of this product are on the California Proposition 65 list.

LABELING; CAUTION! PARTICULATES GENERATED FROM THIS PRODUCT MAY CAUSE SKIN AND EYE IRRITATION. Do not get particulates on skin or in eyes. Avoid breathing dust or particulates generated by this product. Wear gloves and goggles, as appropriate. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water if irritation occurs. If dusts are inhaled, remove to fresh air. If particulates are ingested, do not induce vomiting. Get medical attention if any adverse effect occurs. IN CASE OF FIRE: Use water fog, dry chemical, CO₂, or "alcohol" foam for fires involving surrounding materials. G-1 powder or powdered talc should be used on fires involving dusts of this product. IN CASE OF SPILL: Pick-up or sweep-up product. Place in a suitable container and seal. Consult Material Safety Data Sheet for additional information.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories

CANADIAN WHMIS SYMBOLS: Not applicable.

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16. OTHER INFORMATION**PREPARED BY:**

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

DATE OF PRINTING:

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DEFINITIONS OF TERMS

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

CAS # - This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register, 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The DFG - MAK is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: 0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: LD₅₀ - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC₅₀ - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m³ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include TDLo, the lowest dose to cause a symptom and TCLo the lowest concentration to cause a symptom; TD₀₁, LDLo, and LD₀₁, or TC, TC₀₁, LCLo, and LC₀₁, the lowest doses (or concentration) to cause lethal or toxic effects. BEI - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

U.S. and CANADA: This section explains the impact of various laws and regulations on the material. EPA is the U.S. Environmental Protection Agency. WHMIS is the Canadian Workplace Hazardous Materials Information System. DOT and TC are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (SARA); the Canadian Domestic/Non-Domestic Substances List (DSL/NDSL); the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.

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