

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards. This Material 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 these products.

WARNING: PRODUCT COMPONENTS PRESENT HEALTH AND SAFETY HAZARDS. READ AND UNDERSTAND THIS MATERIAL SAFETY DATA SHEET (M.S.D.S.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES. The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. **BE SURE TO CONSULT THE LATEST VERSION OF THE MSDS. MATERIAL SAFETY DATA SHEETS ARE AVAILABLE FROM AUFHAUSER CORPORATION.**

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

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): SolderFlux Paste (F155)
CHEMICAL NAME/CLASS: Petroleum Gel Mixture
SYNONYMS: Not Applicable
PRODUCT USE: Metal Soldering Operations
SUPPLIER/MANUFACTURER'S NAME: Aufhauser Corporation
ADDRESS: 39 West Mall, Plainview, NY 11803
EMERGENCY PHONE: (516) 694-8696
BUSINESS PHONE: 1-800-645-9486
DATE OF PREPARATION: 03-17-2011

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH – TLV		OSHA – PEL		NIOSH IDLH MG/M ³	OTHER MG/M ³
			TWA MG/M ³	STEL MG/M ³	TWA MG/M ³	STEL MG/M ³		
PETROLATUM	8009-03-8	< 80	NE	NE	NE	NE	NE	NE
ZINC CHLORIDE (EXPOSURE LIMITS ARE FOR ZINC CHLORIDE FUMES)	7646-85-7	< 40	1	2	1	2 (VACATED 1989 PEL)	50	NIOSH RELS: TWA = 1 STEL = 2 CARCINOGEN: EPA-D
ETHYLENE GLYCOL	107-21-1	< 15	NE	100 (CEILING, AEROSOL), A4 (NOT CLASSIFIABLE AS A HUMAN CARCINOGEN)	NE	NE	NE	DFG MAKs: TWA = 26 (DANGER OF CUTANEOUS ABSORPTION) PEAK = 2•MAK 5 MIN., MOMENTARY VALUE DFG MAK PREGNANCY RISK CLASSIFICATION: C CARCINOGEN: TLV-A4
AMMONIUM CHLORIDE (EXPOSURE LIMITS ARE FOR FUMES)	12125-02-9	< 10	10	20	10 (VACATED 1989 PEL)	20 (VACATED 1989 PEL)	NE	NIOSH RELS: TWA = 10 STEL = 20
WATER	7732-18-5	BALANCE	NE	NE	NE	NE	NE	NE

NE = Not Established. See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is an opaque, odorless, tan/gold gel. This product can be slightly irritating to contaminated tissue. This product must be substantially pre-heated before ignition can occur. This product is not reactive. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

HMIS CLASSIFICATION

Health: 3 (Blue) Flammability: 1 (Red) Reactivity: 3 (Yellow) Protective Equipment: X (use respiratory apparatus and body protection see section 8)

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of over-exposure for this product are inhalation of fumes and contact with skin and eyes. The symptoms of overexposure to this product, via route of entry, are as follows:

INHALATION: Inhalation is not anticipated to be a significant route of overexposure to this product. In the unlikely event this product is inhaled, mild irritation of the nose may occur. Symptoms of such over-exposure may include nasal congestion and sneezing.

Though not anticipated to occur during use of this paste flux when the proper precautions are taken, extreme inhalation over-exposure to Zinc Chloride (a component of this product) can have adverse effects on the lungs (i.e. causing pulmonary edema and pneumonitis, life-threatening lung conditions). Inhalation of Zinc Chloride fumes can cause metal fume fever. Symptoms of such overexposures include headache, fever, rapid breathing, sweating and pains in legs and chest. Severe inhalation of vapors or fumes (as may occur if individuals are exposed in poorly ventilated areas, such as confined spaces) may be harmful.

CONTACT WITH SKIN or EYES: This product may be slightly irritating to the skin. Though this paste flux is not classified as a sensitizer, Petrolatum (the main component of this product) may cause allergic skin reactions in hypersensitive individuals. If the paste flux enters the eyes, mild irritation may occur and result in redness and watering. Note: If the product is heated before use, the temperature of the heated product will be above 37°C (100°F); skin or eye contact with the heated product can result in thermal burns.

SKIN ABSORPTION: Skin absorption is not a significant route of overexposure to the components of this product.

INGESTION: If this flux is ingested, nausea, vomiting, and diarrhea may occur (depending on the amount of the product swallowed). Severe ingestion exposures may result in damage to the tissues of the gastrointestinal system, and death.

INJECTION: Though not a likely route of occupational exposure for this product, injection of this product (via punctures or lacerations in the skin) may cause local reddening, tissue swelling, and discomfort.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Symptoms associated with over-exposure to this product are as follows:

ACUTE: The chief acute health hazards associated with this product would be the potential for mild irritation of contaminated tissue. Though unlikely to occur during occupational use, ingestion of large quantities may be fatal.

CHRONIC: Dermatitis may result in chronic skin contact to this product. Refer to Section 11 (Toxicological Information) for additional data on this product's components.

TARGET ORGANS: ACUTE: Eyes; skin. CHRONIC: Skin.

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

4. FIRST-AID MEASURES

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

SKIN EXPOSURE: In the event of skin-over-exposure, rinse affected area with a soap and water solution. If skin contact results in irritation, the minimum flushing is for 15 minutes. Victim must seek medical attention if adverse health effects occur, or if skin contact has resulted in a thermal burn.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention if adverse health effects occur, or if eye contact has resulted in a thermal burn.

INHALATION: If this product is inhaled, remove victim to fresh air. Have victim blow nose.

INGESTION: If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin disorders may be aggravated by prolonged over-exposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT (ASTM D-92): > 198°C (>390°F) [for Petrolatum]

AUTOIGNITION TEMPERATURE: Not determined.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES (for cooling) Carbon Dioxide: YES

Halon: YES Foam: YES

Dry Chemical: YES Other: Any "B" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product must be substantially preheated before ignition can occur. This product can float on water and may travel to distant locations. During a fire, irritating and toxic gases (i.e. carbon monoxide, carbon dioxide, and hydrogen chloride) may be generated.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Not applicable.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a large, uncontrolled release, clear the affected area and protect people. In the event of a non-incident release of this product, minimum Personal Protective Equipment should be **Level D: gloves (rubber gloves over latex gloves), safety goggles, and appropriate body protection. Level B Protection (which includes Self-Contained Breathing Apparatus) during spill response situations in which the oxygen level is below 19.5% or is unknown.** Absorb spilled paste flux with polypads or other suitable absorbent. Rinse area with soap and water solution. If the heated product has been spilled, allow the material to cool before clean-up procedures begin. Decontaminate the area thoroughly. Place all spilled residues in a suitable container and seal. 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 PRACTICES 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.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Standard safety practices associated with welding, brazing and soldering operations should be followed when using this product.

STORAGE AND HANDLING PRACTICES (continued): Open containers slowly, on a stable surface. Avoid the accidental exposure of this material to open flames, hot surfaces, or other sources of ignition. Store this product in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible chemicals (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure they are properly labeled and not damaged.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are normally required when using this product. Prudent practice is to ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: No respiratory protection is normally required when using this product. Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed, U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces.

Respiratory Protection is recommended to be worn during welding operations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). For additional information, the NIOSH recommended respiratory protection guidelines for Zinc Chloride Fumes are provided, as follows:

CONCENTRATION	RESPIRATORY PROTECTION
Up to 10 mg/m ³ :	Dust, mist, and fume respirator or Supplied-Air Respirator (SAR).
Up to 25 mg/m ³ :	Powered air-purifying respirator with dust, mist and fume filter(s) or SAR operated in a continuous-flow mode.
Up to 50 mg/m ³ :	Full-facepiece respirator with high-efficiency particulate filter(s), powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter(s), full-facepiece Self-Contained Breathing Apparatus (SCBA), or full-facepiece SAR.
Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:	Positive pressure, full-facepiece SCBA or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape:	Full-facepiece respirator with high-efficiency particulate filter(s) or escape-type SCBA.
EYE PROTECTION: Safety glasses or goggles. In the event, the heated product is used, a face-shield is recommended.	
HAND PROTECTION: Wear butyl rubber, nitrile rubber, or polyfluorinated polyethylene gloves for routine industrial use.	
BODY PROTECTION: None normally needed for normal circumstances of use. Use body protection appropriate for task (i.e. apron, coveralls, chemically resistant boots).	

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not Applicable

SPECIFIC GRAVITY @ 20°C (water = 1): 0.815-.88

SOLUBILITY IN WATER: Insoluble

VAPOR PRESSURE, mm Hg @ 20°C: N/A

ODOR THRESHOLD: Not Applicable

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not Applicable

APPEARANCE, ODOR AND COLOR: This product is an opaque, odorless, tan/gold gel.

HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance may act as a distinguishing characteristic of this product.

EVAPORATION RATE (nBuAc = 1): 1.5

FREEZING/MELTING POINT: 37-60°C (100-140°F)

pH: Not applicable

BOILING POINT: N/A

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Carbon oxides, a variety organic molecules, hydrogen chloride, zinc oxides, nitrogen oxides and ammonia.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is not compatible with strong oxidizing agents.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposing this product to incompatible materials.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Presented below are human toxicological data available for the components of these products. Other data for animals are available for the components of these products, but are not presented in this Material Safety Data Sheet.

ZINC CHLORIDE:

DNA Inhibition System (human, lymphocyte) = 0.360 mmol/L

TCLo (inhalation, man) = 4800 mg/m³/ 30 minutes; pulmonary effects

TCLo (inhalation, human) = 4800 mg/m³/ 3 hours

ETHYLENE GLYCOL:

DNA Inhibition System (human, lymphocyte) = 320 mmol/L

LDLo (oral, human) = 786 mg/kg

LDLo (oral, human) = 398 mg/kg; central nervous system, gastrointestinal, liver effects

TCLo (inhalation, human) = 10000 mg/m³; eye and pulmonary effects

LDLo (unreported, man) = 1637 mg/kg

SUSPECTED CANCER AGENT: The components of this product are listed as follow:

ETHYLENE GLYCOL (Aerosol) ACGIH TLV-A4 (Not Classifiable as to Human Carcinogenicity)

ZINC CHLORIDE: EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)

The other 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 may be slightly irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: Petrolatum (the main component of this product) may cause allergic skin reactions in hypersensitive individuals.

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

Mutagenicity: This product is not reported to produce mutagenic effects in humans. Animal mutation data are available for Ammonium Chloride, Ethylene Glycol, and Zinc Chloride (components of this product) and was obtained during clinical studies on specific animal tissues exposed to high doses of these compounds.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans. Animal embryotoxic data are available for Ethylene Glycol and Zinc Chloride (components of this product).

Teratogenicity: This product is not reported to cause teratogenic effects in humans. Studies on test animals exposed to relatively high doses of Ethylene Glycol and Zinc Chloride (components of this product) indicate teratogenic effects.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Studies on test animals exposed to relatively high doses of Ethylene Glycol and Zinc Chloride (components of this product) indicate adverse reproductive effects.

*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.*

ACGIH BIOLOGICAL EXPOSURE INDICES: Currently, there are no ACGIH Biological Exposure Indices (BEIs) determined for the component of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will slowly react with water, oxygen, and other substances to form a wide variety of inorganic compounds. The following environmental data are available for the components of this product:

ETHYLENE GLYCOL: Log Kow = 1.36. The bioconcentration factor of Ethylene Glycol in fish was reported to be 10 after 3 days of exposure; this suggests that it will not bioconcentrate in fish. Biological Oxygen Demand, 0.47 g oxygen/ g Ethylene Glycol; Chemical Oxygen Demand - 1.29 g oxygen/ g Ethylene Glycol.

ZINC CHLORIDE: Water solubility: 432 g/ 100 mL (25°C), 614 g/ 100 mL (100°C). Zinc can persist indefinitely as a cation. Radioactive zinc (65Zn) has been found to concentrate in plants and milk. Acute Hazard Level Threshold: For vegetables and other crops - 750 ppm (Zn).

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to plant and animals, depending on the quantity and duration of over-exposure. Specific data on test animals are available, but are not presented in this Material Safety Data Sheet.

12. ECOLOGICAL INFORMATION (continued)

EFFECT OF CHEMICAL ON AQUATIC LIFE: Because this product contains a petroleum-based material which can float on water, thereby depriving oxygen to impacted bodies of water, large releases of this product is may be harmful to aquatic plant and animal life. Additionally, odorless 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. Additional aquatic toxicity information for the components of this product is as follows:

<p>ETHYLENE GLYCOL: LD₅₀ (<i>Carassius auratus</i>, goldfish) = 5000 mg/L/24 hour modified ASTM D 1345 LC₅₀ (<i>Poecilia reticulata</i>, guppies) = 49300 ppm/7 days LC₅₀ (rainbow trout) = 18,500 mg/L/96 hours LC₅₀ (rainbow trout) = 41000 mg/L/96 hours at 20 ±C LC₅₀ (<i>Crangon crangon</i>, brown shrimp) = 100 mg/L 48 hours - aerated salt water LC₅₀ (<i>Carassius auratus</i>, goldfish) = 5000 mg/L/24 hours/ 20 ±C/ static conditions</p>	<p>ETHYLENE GLYCOL: Toxicity threshold, cell multiplication test (<i>Pseudomonas putida</i>, bacteria) = 10,00 mg/L Toxicity threshold, cell multiplication test (<i>Entosiphon sulcatum</i>, protozoan) = 10,00 mg/L Toxicity threshold, cell multiplication test (<i>Uronema parduzi</i> Chatton-Lwoff, protozoan) = 10,00 mg/L Toxicity threshold, cell multiplication test (<i>Chorella pyrenoidasa</i>, algae) = 180,000 mg/L; toxic Toxicity threshold, cell multiplication test (<i>Microcystis aeruginosa</i>, algae) = 2,000 mg/L</p>
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13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations 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 hazardous waste regulatory authority.

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

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS (Per 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

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2000: Not Applicable

MARINE POLLUTANT: The components of this product are not designated by the Department of Transportation to be Marine Pollutants (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is not considered as dangerous goods, per regulations of Transport Canada.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of these products 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)
Ammonium Chloride	No	Yes	No
Ethylene Glycol	No	Yes	Yes
Zinc Chloride	No	Yes	Yes (as Zinc Compound)

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Ammonium Chloride = 5000 lb (2270 kg); Ethylene Glycol = 5000 lb (2270 kg); Zinc Chloride = 1000 lb (454 kg)

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

15. REGULATORY INFORMATION (continued)

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

Alaska - Designated Toxic and Hazardous Substances: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

California - Permissible Exposure Limits for Chemical Contaminants: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

Florida - Substance List: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

Illinois - Toxic Substance List: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

Kansas - Section 302/313 List: Ethylene Glycol.

Massachusetts - Substance List: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

Missouri - Employer Information/Toxic Substance List: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

New Jersey - Right to Know Hazardous Substance List: Ammonium Chloride, Ethylene Glycol, Zinc Chloride fume.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Ammonium Chloride, Zinc Chloride.

Pennsylvania - Hazardous Substance List: Ammonium Chloride, Ethylene Glycol, and Zinc Chloride.

Rhode Island - Hazardous Substance List: Ammonium Chloride fume, Ethylene Glycol, Zinc Chloride fume.

Texas - Hazardous Substance List: Zinc Chloride fume.

West Virginia - Hazardous Substance List: Zinc Chloride fume.

Wisconsin - Toxic and Hazardous Substances: Zinc Chloride fume.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: The components of this product are on the DSL Inventories.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: Ethylene Glycol is on the CEPA Second Priorities Substances List.

CANADIAN WHMIS SYMBOLS:

Class D2B: Other Toxic Effects.



16. OTHER INFORMATION

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March 17, 2009

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.

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 causes 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:

Human and Animal Toxicology: 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. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** 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 Information:** **BEI** - ACGIH 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. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms which consume contaminated plant or animal matter. Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **U.S.:** **EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute (**ANSI Z129.1**).

CANADA:

CEPA is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDL** are the Canadian Domestic/Non-Domestic Substances Lists. **The CPR is the Canadian Product Regulations.** This section also includes information on the precautionary warnings, which appear on the materials package label.