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.DS.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES. This product may contain Chromium and/or Nickel which are listed by OSHA, NTP, or IARC as being a carcinogen or potential carcinogen. Use of this product may expose you or others to fumes and gases at levels exceeding those established by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Occupational Safety and Health Administration (OSHA) 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 HARRIS PRODUCTS GROUP** salesinfo@jwharris.com 513-754-2000 **www.harrisproductsgroup.com**

STATEMENT OF LIABILITY-DISCLAIMER

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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):	**BRIDGIT® SOLDERING FLUX**
CHEMICAL NAME/CLASS:	Inorganic Chloride/ Mineral Oil Mixture
SYNONYMS:	Not Applicable
PRODUCT USE:	Metal Soldering Operations
DOCUMENT NUMBER:	0018
SUPPLIER/MANUFACTURER'S NAME:	**HARRIS PRODUCTS GROUP**
ADDRESS:	4501 Quality Place, Mason, Ohio 45040
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	513-754-2000 **FAX** 513-754-8778
DATE OF PREPARATION:	November 24, 2010

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH - TLV		OSHA - PEL		NIOSH	OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Ammonium Chloride The exposure limits provided are for "Ammonium Chloride Fumes".	12125-02-9	5	10	20	10 (Vacated 1989 PEL)	20 (Vacated 1989 PEL)	NE	NIOSH RELs: TWA = 10 STEL = 20
Ethylene Glycol	107-21-1	10	100 (ceiling) Aerosol	NE	NE	125 [ceiling] (Vacated 1989 PEL)	NE	DFG MAKs: TWA = 26 (skin) PEAK = 2•MAK, 5 min., momentary value Carcinogen: TLV-A4
Isopropyl Alcohol	67-63-0	10	983 NIC-491	1230 NIC-984	980	1225 (Vacated 1989 PEL)	2000 ppm (based on 10% of LEL)	NIOSH REL: TWA = 980 STEL = 1225 DFG MAKs: TWA = 500 PEAK = 2•MAK, 30 min., average value DFG MAK Pregnancy Risk Classification: C

								Carcinogen: IARC-3

NE = Not Established. See Section 16 for Definitions of Terms Used. Single values shown are maximum, unless otherwise noted
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.

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Zinc Chloride The exposure limits provided are for "Zinc Chloride Fumes".	7646-85-7	20	1	2	1	2 (Vacated 1989 PELs)	50	NIOSH RELs: TWA = 1 STEL = 2 Carcinogen: EPA-D
Mineral Oil The exposure limits provided are for "Oil Mist, Mineral".	8012-95-1	> 30	5	10 NIC-delete STEL	5	NE	2500	NIOSH RELs: TWA = 5 STEL = 10

NE = Not Established. See Section 16 for Definitions of Terms Used. Single values shown are maximum, unless otherwise noted
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 consists of an off-white paste with a slight alcohol odor. This mixture can be irritating, and may damage contaminated tissues (especially after prolonged over-exposures). This product must be substantially preheated before ignition can occur. If involved in a fire, this product may decompose to produce irritating vapors and toxic gases, including hydrogen chloride. This product is not reactive under normal circumstances. Emergency responders must wear the proper 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 and inhalation of dusts of fumes of this product.

INHALATION: If vapors of this product are inhaled, irritation of the nose and respiratory system can occur. This paste contains a central nervous system depressant (Isopropyl Alcohol). Depending on the duration of inhalation over-exposure, symptoms such as coughing, sneezing headache, difficulty breathing, and dizziness may develop. Though not anticipated to occur during use of this paste when the proper precautions are taken, extreme inhalation over-exposure to the Zinc Chloride 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 over-exposures include headache, fever, rapid breathing, sweating and pains in legs and chest. Extreme over-exposures to the fumes of this product cause liver and kidney disorders, and may be fatal.

CONTACT WITH SKIN or EYES: Contact with the eyes will cause irritation, pain, and reddening. Prolonged exposure of the eyes may result in permanent eye damage. Skin contact can cause reddening and irritation. Prolonged over-exposures can result in ulceration of the contaminated tissues, which could leave scars. There are some reports that the Ethylene Glycol component of this product may cause allergic skin reaction in susceptible individuals. Symptoms may include dryness, redness, itching, rash or welts.

SKIN ABSORPTION: The Isopropyl Alcohol and Ethylene Glycol components of this product can be absorbed via intact skin. Although toxicity via this route of exposure is expected to be low, other compounds may be carried into the system that could have adverse effect.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH	(BLUE)	2
FLAMMABILITY	(RED)	1
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		X

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

See Section 16 for Definition of Ratings

For routine industrial applications

3. HAZARD IDENTIFICATION (Continued)

INGESTION: Ingestion is not anticipated to be a route of occupational exposure for this product. 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, kidney failure 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. Symptoms such as those described for "Ingestion" may occur.

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

ACUTE: This product is irritating to contaminated eyes, skin, and mucous membranes, and any other exposed tissue. Prolonged over-exposures may result in burns. If vapors or fumes from this product are inhaled, irritation of the respiratory system may occur, with coughing, and breathing difficulty. Inhalation of higher levels may cause significant irritation and adverse effects of the central nervous system. Ingestion of small amounts will result in nausea, vomiting, abdominal pain and adverse effects on the central nervous system. Ingestion of large amounts may be fatal or cause kidney failure.

CHRONIC: Chronic skin exposure to this product may result in dermatitis or cause allergic reaction in susceptible individuals. Chronic ingestion may cause damage to the kidneys. Based on animal data, exposure to products containing Ethylene Glycol may cause adverse reproductive effects. Refer to Section 11 (Toxicology Information) for additional data

TARGET ORGANS: ACUTE: Skin, eyes, respiratory system, kidneys, central nervous system. CHRONIC: Skin, kidneys.

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

SKIN EXPOSURE: If these products contaminate the skin, begin decontamination with running water. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse reaction occurs.

EYE EXPOSURE: If this product enters 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.

INHALATION: If vapors or fumes of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect occurs.

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, respiratory and liver or kidney disorders may be aggravated by prolonged over-exposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations may prove useful. Consultation with an ophthalmologist is recommended if eye exposure leads to tissue damage. Prompt diagnosis and initiation of treatment, including ethanol therapy and hemodialysis is necessary to ameliorate the effects of Ethylene Glycol ingestion.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not determined.

AUTOIGNITION TEMPERATURE: Not determined.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS:

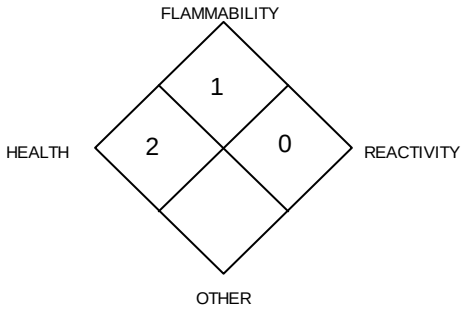
Water Spray: YES (for cooling)
Halon: YES
Dry Chemical: YES
Carbon Dioxide: YES
Foam: YES
Other: Any "B" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product must be substantially preheated before ignition can occur. During a fire, this material may decompose and produce irritating fumes and toxic gases (including hydrogen chloride, zinc oxides, carbon monoxide, carbon dioxide, and nitrogen oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.

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

NFPA RATING



See Section 16 for Definition of Ratings

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 spill, clear the affected area, protect people, and respond with trained personnel. Incidental releases of this product can be cleaned-up by personnel wearing gloves and goggles (or safety glasses). In the event of a non-incidental release, minimum Personal Protective Equipment should be **Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus.** Pick-up paste with polypad or other absorbent agent. Rinse area with a soap and water solution. Decontaminate the area thoroughly. Place all spilled residues in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (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 hands after handling this product. Do not eat or drink while handling this material. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing fumes generated by this product. Use in a well-ventilated location. Open containers slowly, on a stable surface. Containers of this product must be properly labeled. 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 materials (see Section 10, Stability and Reactivity). Inspect all incoming containers before storage to ensure they are properly labeled and not damaged. Wash thoroughly after using this material. Storage areas should be made of fire-resistant materials. Empty containers may contain residual material; therefore, empty containers should be handled with care.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment using soapy water before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

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.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed, Use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent U.S. State standards, or Canadian CSA Standard Z94.4-93. 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 Oil Mist, Mineral and Zinc Chloride are provided, as follows:

OIL MIST, MINERAL

CONCENTRATION	RESPIRATORY PROTECTION
Up to 50 mg/m^3:	Any Air-Purifying Respirator with a high-efficiency particulate filter, or any Supplied-Air Respirator (SAR).
Up to 125 mg/m^3:	Any SAR operated in a continuous-flow mod, or any Powered, Air-Purifying Respirator with a (PAPR) high-efficiency particulate filter.
Up to 250 mg/m^3:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any SAR that has a tight-fitting facepiece and is operated in a continuous-flow mode, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
Up to 2500 mg/m^3:	Any SAR operated in a pressure-demand or other positive-pressure mode.
Emergency or Planned	Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

ZINC CHLORIDE, FUME

CONCENTRATION	RESPIRATORY PROTECTION
Up to 10 mg/m^3:	Any dust, mist, and fume respirator, or any Supplied-Air Respirator (SAR).
Up to 10 mg/m^3:	Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with a dust, mist, and fume .
Up to 50 mg/m^3:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
Emergency or Planned	Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

EYE PROTECTION: Safety glasses. When this product is used in conjunction with soldering, wear safety glasses, goggles or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian Standards. If necessary, refer to U.S. OSHA 29 CFR 1910.138, or appropriate Standards of Canada.

HAND PROTECTION: Wear neoprene gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. When this product is used in conjunction with soldering, wear gloves that protect from sparks and flame (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). If necessary, refer to U.S. OSHA 29 CFR 1910.138, or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate for task. When this product is used in conjunction with soldering, wear clothing that protects from sparks and flame, such as arm protectors, apron, hats, and shoulder protection (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not applicable.
SPECIFIC GRAVITY (water = 1): Not available.
SOLUBILITY IN WATER: Insoluble.
VAPOR PRESSURE, mm Hg @ 20 °C: Not applicable
EVAPORATION RATE (nBuAc = 1): Not applicable.
FREEZING/MELTING POINT: Not available.
BOILING POINT: Not available.
pH: Not applicable.

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

ODOR THRESHOLD: Not applicable.
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not applicable.
APPEARANCE AND COLOR: This product consists of an off-white paste with a slight alcohol odor.
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance is a distinctive characteristic of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable.
DECOMPOSITION PRODUCTS: 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 uncontrolled exposure to extreme temperatures and incompatible materials.

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

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following human toxicological data are available for the components of this product. Other data for animals are available 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/m^3/ 30 minutes; pulmonary effects
TCLo (inhalation, human) = 4800 mg/m^3/ 3 hours

MINERAL OIL:
TCLo (inhalation, man) = 5 mg/m^3/5 yr-intermittent; carcinogenic, teratogenic, and gastrointestinal effects.

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/m^3; eye and pulmonary effects
LDLo (unreported, man) = 1637 mg/kg

ISOPROPYL ALCOHOL:
TDLo (oral, man) = 14432 mg/kg; central nervous system, cardiovascular, pulmonary effects
TDLo(oral, human) = 223 mg/kg, central nervous system, cardiovascular effects
LDLo(oral, man) = 7272 mg/kg
LDLo(oral, human) = 3570 mg/kg; central nervous system, pulmonary, gastrointestinal effects
LDLo(unreported, man) = 2770 mg/kg

SUSPECTED CANCER AGENT: Components of this product are listed as follows:

ETHYLENE GLYCOL: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen)
ISOPROPYL ALCOHOL: IARC-3 (Unclassifiable as to Carcinogenicity in Humans)
ZINC CHLORIDE: EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)

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

IRRITANCY OF PRODUCT: This product can be irritating to contaminated skin and eyes.

SENSITIZATION TO THE PRODUCT: No component of this product is known to be a skin or respiratory sensitizer.

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. Animal mutation data is available for the Zinc Chloride and Ammonium Chloride components of this product and was obtained during clinical studies on specific animal tissues exposed to high doses of these compounds. Mutagenic data have been obtained in clinical studies involving bacteria exposed to high doses of the Isopropyl Alcohol component of this product).

Embryotoxicity This product is not reported to produce embryotoxic effects in humans. Animal embryotoxic data is available for the Zinc Chloride component 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 the Isopropyl Alcohol 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 the Isopropyl Alcohol 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.

BIOLOGICAL EXPOSURE INDICES: Currently there are no Biological Exposure Indices (BEIs) associated with any 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 K_{ow} = 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.

ISOPROPYL ALCOHOL: Water Solubility = Miscible. Isopropyl Alcohol occurs naturally as a plant volatile and during microbial degradation of animal wastes. When released on land or water, it is apt to volatilize and biodegrade. The estimated half-life in water is 5.4 days Isopropyl alcohol is not expected to bioconcentrate.

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 (^{65}Zn) 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 can be harmful or fatal to plant and animals, depending on the quantity and duration of over-exposure.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may alter the alkalinity of the water, causing adverse effects on aquatic 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:

ISOPROPYL ALCOHOL:

LC_{50} (*Crassus auratus,* goldfish) = 5000 mg/L/24 hours, 29.4 mg/L/ 96 hours
LD_{100} (*Semolitus atromaculatus,* creek chub) = 1,100 mg/L/24 hours
LC_{50} (*Poecilia reticulata, guppies*) = 7060 ppm/7 days
LC_{50} (*Crangon crangon,* brown shrimp) = 1150 mg/L/96 hours
LC_{50} (*Crassus auratus,* goldfish) = 5000 mg/L/24 hours, 29.4 mg/L/ 96 hours
LC_{50} (*Pimephales promelas,* fathead minnow) = 11830 mg/L/1 hour
LC_{50} (*Pimephales promelas,* fathead minnow) = 11160 mg/L/24 hours
LC_{50} (*Pimephales promelas,* fathead minnow) = 11130 mg/L/72/96 hours
LC_{50} (*Pimephales promelas,* fathead minnow) = 9.64 g/L/96 hours
LC_{50} (*Pimephales promelas,* fathead minnow) = 10.4 g/L/96 hours
LC_{50} (*Pimephales promelas,* fathead minnow) = 6.55 g/L/96 hours
LC_{50} (*Pseudomonas pudita*) = 1050 mg/L
Cell Multiplication Test (*Microcytis aeruginosa*, algae) = 1000 mg/L
Cell Multiplication Test (*Scenedesmus gadricauda,* green algae) = 1800 mg/L
Cell Multiplication Test (*Entosiphon sulcatum*) = 4930 mg/L
Cell Multiplication Test (*Uronema parduczi Chatton-Lwoff*) = 3425 mg/L

ETHYLENE GLYCOL:

LD_{50} (*Carassius auratus*, goldfish) = 5000 mg/L/24 hour modified ASTM D 1345
LC_{50} (*Poecilia reticulata*, guppies) = 49300 ppm/7 days
LC_{50} (rainbow trout) = 18,500 mg/L/96 hours
LC_{50} (rainbow trout) = 41000 mg/L/96 hours at 20 EC
LC_{50} (*Crangon crangon*, brown shrimp) = 100 mg/L 48 hours - aerated salt water
LC_{50} (*Carassius auratus*, goldfish) = 5000 mg/L/24 hours/ 20 EC/ static conditions
Toxicity threshold, cell multiplication test (*Pseudomonas pudita,* bacteria) = 10,00 mg/L
Toxicity threshold, cell multiplication test (*Entosiphon sulcatum,* protozoan) = 10,00 mg/L
Toxicity threshold, cell multiplication test (*Uronema parduzi* Chatton-Lwoff, protozoan) = 10,00 mg/L
Toxicity threshold, cell multiplication test (*Chorella pyrenoidasa,* algae) = 180,000 mg/L; toxic
Toxicity threshold, cell multiplication test (*Microcystis aeruginosa,* algae) = 2,000 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. 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.

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

14. TRANSPORTATION INFORMATION

THIS PRODUCT IS NOT HAZARDOUS (Per 49 CFR 172.101) BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not Regulated
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: 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, per regulations of Transport Canada.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

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 Chloride	NO	YES	NO
Ammonium Chloride	NO	YES	NO
Isopropyl Alcohol	NO	NO	YES (Manufacturing, Strong Acid Process)
Ethylene Glycol	NO	YES	YES

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

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

U.S. CERCLA REPORTABLE QUANTITY (RQ): Ammonium Chloride = 5000 lbs (2270 kg), Zinc Chloride = 1000 lbs (454 kg). A statutory 1 lb Reportable Quantity is applicable for Ethylene Glycol under Clean Air Act Section 112 (b), until this value is adjusted.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

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: Zinc Chloride fume, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

California - Permissible Exposure Limits for Chemical Contaminants: Zinc Chloride fume, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

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

Illinois - Toxic Substance List: Zinc Chloride fume, Ammonium Chloride vapor Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

Kansas - Section 302/313 List: Isopropyl Alcohol, Ethylene Glycol.

Massachusetts - Substance List: Zinc Chloride fume, Ammonium Chloride, Ammonium Chloride fume Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

Michigan - Critical Materials Register: None..

Minnesota - List of Hazardous Substances: Zinc Chloride fume, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

Missouri - Employer Information/Toxic Substance List: Zinc Chloride, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, and Mineral Oil Mist.

New Jersey - Right to Know Hazardous Substance List: Zinc Chloride fume, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

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

Pennsylvania - Hazardous Substance List: Zinc Chloride, Zinc Chloride fume, Ammonium Chloride, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

Rhode Island - Hazardous Substance List: Zinc Chloride fume, Ammonium Chloride fume, Isopropyl Alcohol, Ethylene Glycol, Mineral Oil Mist.

Texas - Hazardous Substance List: Zinc Chloride fume, Isopropyl Alcohol, Mineral Oil Mist.

West Virginia - Hazardous Substance List: Zinc Chloride fume, Isopropyl Alcohol, Mineral Oil Mist.

Wisconsin - Toxic and Hazardous Substances: Zinc Chloride fume, Isopropyl Alcohol, Mineral Oil Mist.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The components of this product are not on the California Proposition 65 lists. **WARNING: This product when used may produce fumes or gases containing chemicals, known to the State of California to cause cancer, and/or birth defects (or other reproductive harm)**

ANSI LABELING (Z129.1) (Precautionary Statements): WARNING! SKIN AND EYE IRRITANT. MAY BE FATAL IF SWALLOWED. MAY BE HARMFUL IF DUSTS OR FUMES ARE INHALED. MAY CAUSE ALLERGIC SKIN REACTIONS IN HYPERSENSITIVE INDIVIDUALS. Avoid contact with skin, eyes, and clothing. Use only with adequate ventilation. Avoid breathing dust or fumes. Keep container closed. Wash thoroughly after handling. Wear gloves and safety goggles when using this product. FIRST AID: In case of contact , immediately flush skin or eyes for at least 15 minutes. If inhaled, move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, do not induce vomiting. Seek medical attention. IN CASE OF FIRE: Use fog, foam, dry chemical or CO_2. IN CASE OF SPILL: Absorb material and remove. Flush area with water. Refer to MSDS for additional information.

15. REGULATORY INFORMATION (Continued)

WARNING:

PROTECT yourself and others. Read and understand this information.

FUMES AND GASES can be hazardous to your health.

ARC RAYS can injure your eyes and burn skin.

ELECTRIC SHOCK can kill.

HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes.

- Before use, read and understand the manufacturer's instructions. Material Safety Data Sheets (MSDSs), and your employer's safety policies.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- FOR MAXIMUM SAFETY, BE CERTIFIED FOR AND WEAR A RESPIRATOR AT ALL TIMES WHEN WELDING OR BRAZING
- Wear correct eye, ear, and body protection.
- Do not touch live electrical parts.

See American National Standard Z49.1 *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126. OSHA Safety and Health Standards, *29 CFR 1910*, available from the U.S. Government Printing Office, Superintendent office, P.O. Box 371954, Pittsburgh, PA 15250-7954.

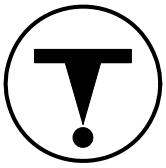
ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No components of this product are on the CEPA Priority Substances Lists.

CANADIAN WHMIS SYMBOLS: D2B: Poisonous and Infectious Material/Other Toxic Effects.



16. OTHER INFORMATION

DATE OF PRINTING: November 24, 2010

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 this product. The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. To the best of the Harris Products Group knowledge, the information and recommendations contained in this publication are reliable and accurate as of the date of issue. However, accuracy, suitability, or completeness are not guaranteed, and no warranty, guarantee, or representation, expressed or implied, is made by Harris Products Group as to the absolute correctness or sufficiency of any representation contained in this and other publications; Harris Products Group assumes no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures may not be required under particular or exceptional conditions or circumstances. Data may be changed from time to time. Be sure to consult the latest edition.

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.

IARC-International Agency for Research on Cancer **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 (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference. **NTP-** National Toxicology Program

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: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - 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/m^3** 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 lifeforms 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/NDSL** 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.