

## Safety Data Sheet (SDS)

[www.HMTsolder.com](http://www.HMTsolder.com)

To comply with European CLP Regulation 1272/2008, US 29CFR 1910.1200 OSHA's Hazard Communication Standard, and Australian NOHSC: 1008 [2004] and ADG Code 7.4

### 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** HMT Solder Lead Free Solder Paste  
**SYNONYMS:** Paste, Solder Cream  
**PART NUMBERS:** HMT19Ge-T3-100S, HMT19Ge-T3-250J, HMT19Ge-T3-35S, HMT19Ge-T3-500J, HMT19Ge-T3-600C, HMT19Ge-T4-100S, HMT19Ge-T4-250J, HMT19Ge-T4-35S, HMT19Ge-T4-500J, HMT19Ge-T4-600C, HMT19Ge-T5-100S, HMT19Ge-T5-250J, HMT19Ge-T5-35S, HMT19Ge-T5-500J, HMT19Ge-T5-600C, HMT11LT-T3-100S, HMT11LT-T3-250J, HMT11LT-T3-35S, HMT11LT-T3-500J, HMT11LT-T3-600C, HMT11LT-T4-100S, HMT11LT-T4-250J, HMT11LT-T4-35S, HMT11LT-T4-500J, HMT11LT-T4-600C, HMT11LT-T5-100S, HMT11LT-T5-250J, HMT11LT-T5-35S, HMT11LT-T5-500J, HMT11LT-T5-600C, HMT43LT-T3-100S, HMT43LT-T3-250J, HMT43LT-T3-35S, HMT43LT-T3-500J, HMT43LT-T3-600C, HMT43LT-T4-100S, HMT43LT-T4-250J, HMT43LT-T4-35S, HMT43LT-T4-500J, HMT43LT-T4-600C, HMT43LT-T5-100S, HMT43LT-T5-250J, HMT43LT-T5-35S, HMT43LT-T5-500J, HMT43LT-T5-600C, HMT19SAC-T3-100S, HMT19SAC-T3-250J, HMT19SAC-T3-35S, HMT19SAC-T3-500J, HMT19SAC-T3-600C, HMT19SAC-T4-100S, HMT19SAC-T4-250J, HMT19SAC-T4-35S, HMT19SAC-T4-500J, HMT19SAC-T4-600C, HMT19SAC-T5-100S, HMT19SAC-T5-250J, HMT19SAC-T5-35S, HMT19SAC-T5-500J, HMT19SAC-T5-600C, HMT29SAC-T3-100S, HMT29SAC-T3-250J, HMT29SAC-T3-35S, HMT29SAC-T3-500J, HMT29SAC-T3-600C, HMT29SAC-T4-100S, HMT29SAC-T4-250J, HMT29SAC-T4-35S, HMT29SAC-T4-500J, HMT29SAC-T4-600C, HMT29SAC-T5-100S, HMT29SAC-T5-250J, HMT29SAC-T5-35S, HMT29SAC-T5-500J, HMT29SAC-T5-600C, HMT43SAC-T3-100S, HMT43SAC-T3-250J, HMT43SAC-T3-35S, HMT43SAC-T3-500J, HMT43SAC-T3-600C, HMT43SAC-T4-100S, HMT43SAC-T4-250J, HMT43SAC-T4-35S, HMT43SAC-T4-500J, HMT43SAC-T4-600C, HMT43SAC-T5-100S, HMT43SAC-T5-250J, HMT43SAC-T5-35S, HMT43SAC-T5-500J, HMT43SAC-T5-600C, HMT59SAC-T3-100S, HMT59SAC-T3-250J, HMT59SAC-T3-35S, HMT59SAC-T3-500J, HMT59SAC-T3-600C, HMT59SAC-T4-100S, HMT59SAC-T4-250J, HMT59SAC-T4-35S, HMT59SAC-T4-500J, HMT59SAC-T4-600C, HMT59SAC-T5-100S, HMT59SAC-T5-250J, HMT59SAC-T5-35S, HMT59SAC-T5-500J, HMT59SAC-T5-600C, HMT43LOLT-T3-100S, HMT43LOLT-T3-250J, HMT43LOLT-T3-35S, HMT43LOLT-T3-500J, HMT43LOLT-T3-600C, HMT43LOLT-T4-100S, HMT43LOLT-T4-250J, HMT43LOLT-T4-35S, HMT43LOLT-T4-500J, HMT43LOLT-T4-600C, HMT43LOLT-T5-100S, HMT43LOLT-T5-250J, HMT43LOLT-T5-35S, HMT43LOLT-T5-500J, HMT43LOLT-T5-600C, HMT43LOSAC-T3-100S, HMT43LOSAC-T3-250J, HMT43LOSAC-T3-35S, HMT43LOSAC-T3-500J, HMT43LOSAC-T3-600C, HMT43LOSAC-T4-100S, HMT43LOSAC-T4-250J, HMT43LOSAC-T4-35S, HMT43LOSAC-T4-500J, HMT43LOSAC-T4-600C, HMT43LOSAC-T5-100S, HMT43LOSAC-T5-250J, HMT43LOSAC-T5-35S, HMT43LOSAC-T5-500J, HMT43LOSAC-T5-600C, HMT55SAC-T3-35S, HMT55SAC-T3-100S, HMT55SAC-T3-250J, HMT55SAC-T4-500J, HMT55SAC-T4-600C, HMT55SAC-T5-35S, HMT55SAC-T5-100S, HMT55SAC-T5-250J, HMT55SAC-T5-500J, HMT55SAC-T5-600C, HMT55HFSAC-T3-35S, HMT55HFSAC-T3-100S, HMT55HFSAC-T3-250J, HMT55HFSAC-T3-500J, HMT55HFSAC-T3-600C, HMT55HFSAC-T4-35S, HMT55HFSAC-T4-100S, HMT55HFSAC-T4-250J, HMT55HFSAC-T4-500J, HMT55HFSAC-T4-600C, HMT55HFSAC-T5-35S, HMT55HFSAC-T5-100S, HMT55HFSAC-T5-250J, HMT55HFSAC-T5-500J, HMT55HFSAC-T5-600C, HMT55LT-T3-35S, HMT55LT-T3-100S, HMT55LT-T3-250J, HMT55LT-T3-500J, HMT55LT-T3-600C, HMT55LT-T4-35S, HMT55LT-T4-100S, HMT55LT-T4-250J, HMT55LT-T4-500J, HMT55LT-T4-600C, HMT55LT-T5-35S, HMT55LT-T5-100S, HMT55LT-T5-250J, HMT55LT-T5-500J, HMT55LT-T5-600C, HMT55HFLT-T3-35S, HMT55HFLT-T3-100S, HMT55HFLT-T3-250J, HMT55HFLT-T3-500J, HMT55HFLT-T3-600C, HMT55HFLT-T4-35S, HMT55HFLT-T4-100S, HMT55HFLT-T4-250J, HMT55HFLT-T4-500J, HMT55HFLT-T4-600C, HMT55HFLT-T5-35S, HMT55HFLT-T5-100S, HMT55HFLT-T5-250J, HMT55HFLT-T5-500J, HMT55HFLT-T5-600C, HMT19LT-T3-35S, HMT19LT-T3-100S, HMT19LT-T3-250J, HMT19LT-T3-500J, HMT19LT-T3-600C, HMT19LT-T4-35S, HMT19LT-T4-100S, HMT19LT-T4-250J, HMT19LT-T4-500J, HMT19LT-T4-600C, HMT19LT-T5-35S, HMT19LT-T5-100S, HMT19LT-T5-250J, HMT19LT-T5-500J, HMT19LT-T5-600C

**MANUFACTURER:** HMT Solder Inc.  
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8-1500 Sandhill Dr., Ancaster, ON L9G 4V5 (Canada)  
**PHONE:** (800) 717-2786  
**EMERGENCY PHONE:** (800) 424-9300 (USA and Canada 24/7 CHEMTREC)  
**REVISION DATE:** 2022/03/21  
**REVISION NUMBER:** 1.3  
**REVISED BY:** HMT Solder Product Safety

**PRODUCT USE:** Soldering components for bonding semiconductor chips and packages to circuit boards. This product is for industrial use only.

### 2. HAZARD IDENTIFICATION

Classified in accordance with European CLP Regulation 1272/2008

Acute Tox.	4
Skins Sens.	1
Aquatic Acute	1
Aquatic Chronic	1

**CHEMICAL NAME:** NA  
**CHEMICAL FAMILY:** Mixture  
**CHEMICAL FORMULA:** Proprietary

**ROUTES OF ENTRY:** Inhalation, Ingestion, Skin/Eye Contact

TARGET ORGANS: NA

GHS/CLP:



Signal Word: Warning

GHS/CLP LABEL ELEMENTS:

Hazard statement(s)

H302 Harmful if swallowed.  
H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H332 Harmful if inhaled.  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H335 May cause respiratory irritation.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P102 Keep out of reach of children.  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P233 Keep container tightly closed.  
P260 Do not breathe dust/fume/gas/mist/vapor/spray.  
P262 Do not get in eyes, on skin, or on clothing.  
P264 Wash hands thoroughly after handling.  
P270 Do not eat, drink, or smoke when using this product.  
P271 Use in a well-ventilated area.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P284 In case of inadequate ventilation wear respiratory protection.  
P301/P330/P331/P310 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a POISON CENTER/Doctor.  
P303/P361/P352/P333/P313 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with soap & water. Get medical advice/attention if skin irritation or rash occurs or if you feel unwell.  
P304/P340/312 IF INHALED: Remove victim to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.  
P305/P351/338/P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call POISON CENTER/Doctor.  
P308/P313 IF EXPOSED OR CONCERNED: Get medical advice/attention.  
P342/P311 IF EXPERIENCING RESPIRATORY SYMPTOMS: Call POISON CENTER/Doctor.  
P362 Take off contaminated clothing and wash it before reuse.  
P391 Collect spillage.  
P402/P404 Store in a dry place. Store in a closed container.  
P405 Store locked up.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

#### POTENTIAL HEALTH EFFECTS (CHRONIC and OVEREXPOSURE)

**Tin:** Dust or fumes may cause irritation of the skin mucous membranes and may result in a benign Pneumoconiosis (Stannosis).

**Silver:** May cause discoloration of eyes and skin (Argyria).

**Bismuth:** May cause foul breath, a blue-black line on the gums, and Stomatitis.

**Antimony:** May cause gastrointestinal upset, sleeplessness, irritability, and muscular pain.

**Indium:** May cause weight loss, pulmonary edema, blood damage and degenerative changes in liver and kidneys.

**MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:** Diseases of the blood-forming organs, kidneys, nervous and possibly reproductive systems. Occupational Asthma.

#### SECTION 2 NOTES:

HMT Solder Inc. does not recommend, manufacture, market, or endorse any of its products for human consumption.

#### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Classified in accordance with European CLP Regulation 1272/2008

Hazardous Ingredients <sup>(1)</sup>	C.A.S. Number	Weight Percent	OSHA PEL mg/m <sup>3</sup>	ACGIH TLV TWA mg/m <sup>3</sup>	LD 50 Ingested g/Kg	LD 50 Inhaled g/m <sup>3</sup>
Modified Rosins (Rosin) <sup>(2)</sup>	8050-09-7	<45	NE	NE	NE	NE
Pine Oil Derivatives (Terpineol)	8000-41-7	<5	NE	NE	NE	NE
Mixed Carboxylic Acids (Maleic Acid) <sup>(2)</sup>	110-16-7	<4	NE	NE	NE	NE
Tin	7440-31-5	Product contains	2.00	2.00	NE	NE

Silver	7440-22-4	one or more of these metallic elements in varying percentages	0.01	0.10	NE	NE
Bismuth	7440-69-9		NE	NE	NE	NE
Antimony	7440-36-0		0.50	0.50	7.0 Rat	NE
Indium	7440-74-6		NE	0.10	NE	NE
Copper	7440-50-8		1.00	1.00	NE	NE

Non-Hazardous Ingredients	C.A.S. Number	Weight Percent	OSHA PEL mg/m <sup>3</sup>	ACGIH TLV TWA mg/m <sup>3</sup>	LD 50 Ingested g/Kg	LD 50 Inhaled g/m <sup>3</sup>
Surfactants	NA	<4	NE	NE	NE	NE
Rheological Modifier	NA	<5	NE	NE	NE	NE

### SECTION 3 NOTES:

(1) Per 29 CFR 1910 the mixture has not been tested as a whole. All hazardous components, which comprise 1% of the mixture (0.1% carcinogenic), are listed. Percentages of individual components are not listed as this information is considered a trade secret.

(2) The identity of the specific chemical(s) is being withheld as a trade secret per 29 CFR 1910.1200. The hazardous properties of these ingredients are disclosed in this SDS.

## 4. FIRST-AID MEASURES

**Signs and symptoms of exposure:** Inhalation-Nose and throat irritation, headache, dizziness, difficulty breathing, coughing. Ingestion-nausea, vomiting, cramps. Skin-redness, burning, rash, dryness. Eye-redness, burning, tearing, blurred vision.

### Emergency first aid procedures:

**EYES:** Flush with plenty of water, contact a physician. If contact lenses can be removed easily, flush eyes without contact lenses.

**SKIN:** Wash affected area with plenty of warm, soapy water. If irritation persists, seek medical attention.

**INGESTION:** Call a physician or Poison Control Center immediately. Do not induce vomiting. Drink large amounts of water. Never give anything by mouth to an unconscious person

**INHALATION:** Remove to fresh air. Support respiration if required. If not breathing, seek immediate medical attention.

## 5. FIREFIGHTING MEASURES

**EXTINGUISHING MEDIA:** Dry chemical, foam

**SPECIAL FIRE FIGHTING PROCEDURES:** Do not use water. Use NIOSH-approved self-contained Breathing Apparatus and full protective clothing if involved in a fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** May release Toxic metal and oxide fumes. High concentrations of dust may present explosion hazard. Water trapped below molten metal may explode thus spattering molten metal.

### SECTION 5 NOTES:

Molten solder alloys consisting of Antimony, Bismuth, Copper, Indium, Silver, and/or Tin do not produce significant quantities of fumes below 900° F.

## 6. ACCIDENTAL RELEASE MEASURES

**PRECAUTIONS AND EQUIPMENT:** Material is extremely thick and will not flow out.

**ACCIDENTAL RELEASE MEASURES:** If material spills or leaks use a spatula to collect and place it in a plastic or glass jar. Remove traces of residue using cloth rags or paper towels moistened with Isopropyl Alcohol. Exposure to spilled material may be irritating. Follow on-site personal protective equipment recommendations.

**ENVIRONMENTAL PRECAUTIONS:** Avoid release to the environment. Collect spillage.

### SECTION 6 NOTES:

See Sections 2, 4, and 7 for additional information.

## 7. HANDLING AND STORAGE

**HANDLING/STORAGE:** Keep containers tightly closed when not in use. Use care to avoid spills. Avoid inhalation of fumes or dust. Avoid contact with eyes, skin, and clothing. Store in a closed corrosive resistant container, with corrosive resistant liner, in cool dry place. Wear appropriate personal protective equipment when working with or handling. Always wash hands thoroughly after handling this product. Dispose of following Federal, State/Provincial, and Local regulations.

**OTHER PRECAUTIONS:** Empty containers may retain product residues in vapor, liquid, and/or solid form. All labeled hazard precautions should be observed.

**WORK HYGIENIC PRACTICES:** Cosmetics/Food/Drink/Tobacco should not be consumed or used in work areas. Always wash hands after handling material and before applying or using cosmetics/food/drink/tobacco.

### SECTION 7 NOTES:

For industrial use only.

Keep out of reach of children.

Not for internal consumption.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Occupational Exposure Limit Values:

Rosin flux fumes (as total resin acids)

MEL: 0.05 mg/m<sup>3</sup> 8h TWA.

MEL: 0.15 mg/m<sup>3</sup> 15 min.

Extraction is necessary to remove fumes evolved during reflow.

Also see section 3.

**ENGINEERING CONTROLS:** Use only with production equipment designed for use with solder paste.

**VENTILATION:** Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLVs.

**RESPIRATORY PROTECTION:** A (US: NIOSH; EU: EN 140:1998, EN 14387:2004 A) approved air-purifying respirator with fume/organic chemical cartridge should be worn when airborne concentrations may be exceeded. General and local exhaust ventilation is the preferred means of protection.

**EYE PROTECTION:** Use with appropriate eye protection: Goggles or face shield (EU: EN 166-S 3 9).

**SKIN PROTECTION:** Protective gloves should be worn when the possibility of skin contact exists (EU: EN 374-1:2003).

**PROTECTIVE CLOTHING OR EQUIPMENT:** Work clothes should be worn and laundered in accordance with current Lead (Pb) standards (US: OSHA).

**WORK HYGIENIC PRACTICES:** Cosmetics/Food/Drink/Tobacco should not be consumed or used in areas where solder products may be used. Always wash hands after handling soldering products and before applying or using cosmetics/food/drink/tobacco.

**OTHER:** Maintain eye wash stations in work areas. Avoid the use of contact lenses in high fume areas. Clean protective equipment regularly. Clean up spills immediately.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>APPEARANCE:</b>	Grey paste
<b>ODOR:</b>	Odorless
<b>ODOR THRESHOLD:</b>	NE
<b>pH as SUPPLIED:</b>	NA
<b>MELTING POINT:</b>	Varies
<b>FREEZING POINT:</b>	Varies
<b>INITIAL BOILING POINT:</b>	Varies
<b>BOILING RANGE:</b>	NA
<b>FLASH POINT:</b>	NA
<b>EVAPORATION RATE:</b>	NA
<b>FLAMMABILITY (solid):</b>	NE
<b>UPPER/LOWER FLAMMABILITY:</b>	NE
<b>UPPER/LOWER EXPLOSIVE LIMITS:</b>	NE
<b>VAPOR PRESSURE (mmHg):</b>	NA
<b>VAPOR DENSITY (AIR = 1):</b>	NA
<b>RELATIVE DENSITY:</b>	NE
<b>SOLUBILITY IN WATER:</b>	Insoluble
<b>PARTITION COEFFICIENT (n-octanol/water):</b>	NE
<b>AUTOIGNITION TEMPERATURE:</b>	NE
<b>DECOMPOSITION TEMPERATURE:</b>	NE
<b>VISCOSITY:</b>	NA

### SECTION 9 NOTES:

Other physical and chemical properties depend on alloy composition.

## 10. STABILITY AND REACTIVITY

<b>STABILITY:</b>	Stable
<b>CONDITIONS TO AVOID (STABILITY):</b>	NE
<b>INCOMPATIBILITY (MATERIAL TO AVOID):</b>	Oxidizing materials, acids, hydrogen peroxide, bases
<b>HAZARDOUS DECOMPOSITION/BY-PRODUCTS:</b>	Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.
<b>POSSIBILITY OF HAZARDOUS REACTIONS:</b>	NE

## 11. TOXICOLOGICAL INFORMATION

### INHALATION:

This product does not present a risk at ambient temperatures. The flux fumes evolved during soldering will irritate the nose, throat and lungs. Repeated or prolonged exposure to flux fumes may cause an allergic affect which may lead to occupational asthma.

### SKIN:

Contact with flux fumes and flux residues may cause irritation and sensitization.

### EYES:

Flux fumes may cause irritation.

**Health Hazards (acute and chronic):** Contact with dust and fumes may cause skin, eye and respiratory irritation. Ingestion and/or inhalation of material or fumes may result in flu like symptoms, insomnia, muscle weakness, nausea and abdominal pain. Gross inhalation or ingestion may be toxic and can result in death. Symptoms of toxicity may take hours or days to manifest. Chronic exposures, inhalation and ingestion, may result in kidney, red blood cell, reproductive and nervous system effects. Health effects may be cumulative over many exposures. Studies show that health risks vary by individual. Minimize exposure as a precaution. See OSHA 29CFR 1910.1025(subpart Z) for more information.

**ACUTE TOXICITY:**

Product/Ingredient Name	Result	Species	Dose	Exposure
Rosin	LD50 Oral	Rat	7600 mg/kg	-
Terpineol	LD50 Oral	Rat	2000 mg/kg	-
	LD50 Inhalation	Rat	4.76 mg/l	4 hours
	LD50 Dermal	Rat	2000 mg/kg	-
Maleic acid	LD50 Oral	Rat	708 mg/kg	Remarks: Behavioral: Convulsions or effect on seizure threshold. Behavioral: Muscle weakness. Gastrointestinal: Ulceration or bleeding from stomach.
	LD50 Inhalation	Rat	720 mg/m <sup>3</sup>	1 hour
	LD 50 Dermal	Rabbit	1560 mg/kg	Remarks: Behavioral: Tremor
Antimony	LD50 Ingested	Rat	7000 mg/kg	-
Silver	LD50 Oral	Mouse	100 mg/kg	-

**SKIN CORRISSION/IRRITATION:** NE  
**SERIOUS EYE DAMAGE/IRRITATION:** NA  
**RESPIRATORY OR SKIN SENSITIZATION:** NE  
**GERM CELL MUTAGENICITY:** NA  
**CARCINOGENICITY:** NA

<b>OSHA:</b> NA	<b>ACGIH:</b> NA	<b>NTP:</b> NA	<b>IARC:</b> NA
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**REPRODUCTIVE TOXICITY:** NA

**STOT-SINGLE EXPOSURE:**

Product/Ingredient Name	Category	Route of exposure	Target organs
Maleic acid	Category 3	Not applicable	Respiratory tract irritation

**STOT-REPEATED EXPOSURE:** NA

**ASPIRATION HAZARD:** NA

**SECTION 11 NOTES:**

This product has not been tested as a whole to determine its hazards. Synergistic or additive effects of the above chemicals are unknown, as are the effects of exposure to these chemicals in addition to others present in the work place. See Section 2 for additional health hazards.

**12. ECOLOGICAL INFORMATION**

**TOXICITY:**

Product/Ingredient Name	Result	Species	Exposure
Silver	Acute EC50 1.4 µg/l Marine water	Algae - Chroomonas sp.	4 days
	Acute EC50 0.24 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 11 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours
	Acute LC50 2.13 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 5 mg/l Marine water	Algae - Glenodinium halli	72 hours
Rosin	Acute LC50 60.3 mg/l Fresh water	Brachydanio rerio (zebra fish)	96 hours
Terpineol	Acute LC50 62.80 mg/l Fresh water	Danio rerio (zebra fish)	96 hours
	Acute LC50 68 mg/l Marine water	Algae – Pseudokirchneriella subcapitata (green algae)	72 hours
Maleic acid	Acute EC50 316200 µg/l Fresh water	Daphnia - Daphnia magna - Larvae	48 hours
	Acute LC50 5000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
Copper	Acute EC50 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 2.1 µg/l Fresh water	Daphnia - Daphnia longispina - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute IC50 13 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
	Acute IC50 5.4 mg/l Marine water	Aquatic plants - Plantae - Exponential growth phase	72 hours
	Acute LC50 0.072 µg/l Marine water	Crustaceans - Amphipoda - Adult	48 hours
	Acute LC50 7.56 µg/l Marine water	Fish - Periophthalmus waltoni - Adult	96 hours
	Chronic NOEC 2.5 µg/l Marine water	Algae - Nitzschia closterium - Exponential growth phase	72 hours

	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
	Chronic NOEC 0.02 mg/l Fresh water	Crustaceans - Cambarus bartonii - Mature	21 days
	Chronic NOEC 2 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 0.8 µg/l Fresh water	Fish - Oreochromis niloticus - Juvenile (Fledgling, Hatchling, Weanling)	6 weeks

**PERSISTENCE AND DEGRADABILITY:** NE

**BIOACCUMULATIVE POTENTIAL:**

Product/Ingredient Name	LogP <sub>ow</sub>	BCF	Potential
Silver	-	70	Low
Rosin	1.9 to 7.7	-	High
Terpineol			NE
Maleic acid	-1.3	-	Low

**MOBILITY IN SOIL:** NE

**RESULT OF PBT and vPvB ASSESSMENT:** Not applicable

**OTHER ADVERSE EFFECTS:** NE

### 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** Scrap and waste should be recycled or stored in a dry, sealed container for later disposal. Disposal must be in accordance with Federal, State/Provincial, and Local Regulations.

**OTHER PRECAUTIONS:** Avoid skin & eye contact, inhalation & ingestion of fumes and material. Wash contaminated clothing before reuse. Keep away from children.

### 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

**UN Number:** Not available  
**UN Proper Shipping Name:** Not available  
**Packaging Group:** Not applicable  
**Environmental Hazards:** None

### TRANSPORT HAZARD CLASSES:

US DOT Hazardous Material Classification: Non-Hazardous  
Water Transportation: Non-Hazardous  
IATA Hazardous Material Classification: Non-Hazardous  
ADR Road Regulations: Not regulated  
IMDG Sea Regulations: Not regulated  
ADG Land Transportation: Not regulated

### 15. REGULATORY INFORMATION

All ingredients used to manufacture this product are listed on the EPA TSCA Inventory. Finished product is not listed on the EPA TSCA Inventory.

**U.S. FEDERAL REGULATIONS:** Not regulated

**STATE REGULATIONS:** Not regulated

**INTERNATIONAL REGULATIONS:** Not regulated

**AUSTRALIAN REGULATIONS:** Not regulated

### 16. OTHER INFORMATION

#### LEGEND:

**ACGIH** American Conference of Governmental Industrial Hygienists  
**ADG** Australian Dangerous Goods Code  
**ADR** European Agreement concerning the International Carriage of Dangerous Goods by Road  
**AICS** Australian Inventory of Chemical Substances  
**BCF** Bioconcentration factor  
**C.A.S.** Chemical Abstract Service  
**CLP** Classification, Labeling and Packaging  
**DOT** Department of Transportation  
**EC** Effective Concentration  
**EPA** Environmental Protection Agency  
**GHS** Global Harmonized System  
**HMIS** Hazardous Material Identification System  
**IARC** International Agency for Research on Cancer  
**IATA** International Air Transport Association  
**IMDG** International Maritime Dangerous Goods Code  
**LC** Lethal Concentration  
**LD** Lethal Dose  
**NA** Not available  
**NE** Not established  
**NIOSH** National Institute for Occupational Safety & Health

<b>NOEC</b>	No observed effective concentration
<b>NOHSC</b>	National Occupational Health and Safety Commission (Australia)
<b>NTP</b>	National Toxicology Program
<b>OSHA</b>	Occupational Safety and Health Administration
<b>PEL</b>	Permissible Exposure Limit
<b>P<sub>ow</sub></b>	Octanol water partition coefficient
<b>SDS</b>	Safety Data Sheet
<b>STEL</b>	Short-Term Exposure Limit
<b>STOT</b>	Specific target organ toxicity
<b>TLV</b>	Threshold Limit Value
<b>TSCA</b>	Toxic Substance Control Act
<b>TWA:</b>	Time Weighted Average
<b>US DOT:</b>	United States Department of Transportation

**PREPARATION INFORMATION:**

This update supersedes all previously released documents.

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