Parker Hannifin Corp.
Chomerics Division
77 Dragon Court
Woburn, MA, USA, 01888
Telephone: (781) 935 4850

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SECTION 1: IDENTIFICATION

Product identifier used on the label
: **Silver-Filled Epoxy Systems Part 1**

Other means of identification : 72-08116-1; 72-00218A; 72-00348A; 72-90005B; 72-11011

Recommended use of the chemical and restrictions on use
: Bonding agent.
No restrictions on use known.

Chemical family : Mixture of: Inorganic substances in powdered form; Amines; Ether; silane compounds

SDS number : PHC-001

Name, address, and telephone number of the manufacturer:

Parker Hannifin Corp.
Chomerics Division
77 Dragon Court
Woburn, MA, USA
01888

Manufacturer's Telephone # : (781) 935-4850

24 Hr. Emergency Tel # : INFOTRAC - (800) 535-5053 (Within Continental US); (352) 323-3500 (Outside US)

Name, address, and telephone number of the supplier:

Refer to manufacturer

SECTION 2: HAZARDS IDENTIFICATION

Classification of the chemical

Silver paste. Solvent odor.

Most important hazards:
Flammable liquid and vapor. May be ignited by open flame.
May cause an allergic skin reaction. Possible mutagen. Suspected of causing cancer. Occupational exposure to the substance or mixture may cause adverse effects. For further information, please refer to section 11 of the SDS.
Toxic to aquatic life with long lasting effects. Avoid release to the environment. See Section 12 for more environmental information.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
- Flammable liquid - Category 3
- Skin sensitization - Category 1
- Germ cell mutagenicity - Category 2
- Carcinogenicity - Category 2

Label elements

Hazard pictogram(s)

Signal Word

WARNING!

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Hazard statement(s)

Flammable liquid and vapor.
May cause an allergic skin reaction.
Suspected of causing genetic defects.
Suspected of causing cancer.

Precautionary statement(s)

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep container tightly closed. Ground/Bond container and receiving equipment. Use explosion-proof electrical and ventilating equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing dust or spray mist. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/clothing and eye/face protection.
IF exposed or concerned: Get medical advice/attention.
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
In case of fire, use dry chemical, CO2, or alcohol foam to extinguish.
Store in a well-ventilated place. Keep cool. Store locked up.
Dispose of contents/container in accordance with local regulation.

Other hazards

Other hazards which do not result in classification:
May hydrolyze in the presence of water to Methanol. Methanol is considered to be dangerous. May release peroxides on exposure to light and air, or on contact with incompatibles. Rate of peroxide formation is not known. Toxic fumes, gases or vapours may evolve on burning. May be mildly irritating to skin, eyes and respiratory system. Inhalation of fumes may result in metal fume fever, a flu-like illness. May cause gastrointestinal irritation. Prolonged overexposure may cause slight liver and kidney effects, such as increased organ weights. Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Chemical name	Common name and synonyms	CAS #	Concentration (% by weight)
silver	Silver metal Argentum	7440-22-4	**65.0 - 85.0**
Bisphenol A / epichlorohydrin resin	Reaction product: bisphenol-A-(epichlorohydrin)	25068-38-6	**10.0 - 30.0**
n-Butyl glycidyl ether	2,3-Epoxypropyl butyl ether Butoxymethyloxirane BGE	2426-08-6	**1.0 - 5.0**
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	gamma-Glycidoxypropyltri-methoxysilane 3-(Trimethoxysilyl)propyl glycidol ether	2530-83-8	**0.1 - 1.0**

The exact concentrations of the above listed chemicals are being withheld as a trade secret.

SECTION 4. FIRST-AID MEASURES

Description of first aid measures

Ingestion : Do not induce vomiting. Never give anything by mouth to a person who is unconscious or is having convulsions. IF exposed or concerned: Get medical attention/advice.

Inhalation : Move to fresh air. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing stops, provide artificial respiration. IF exposed or concerned: Get medical attention/advice.

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Skin contact : IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact : Rinse thoroughly with plenty of water, also under the eyelids. IF exposed or concerned: Get medical attention/advice.

Most important symptoms and effects, both acute and delayed

: May cause severe skin sensitization with allergic contact dermatitis symptoms such as swelling, rash and eczema.
Suspected of causing genetic defects.
Suspected of causing cancer. Symptoms may include persistent coughing, shortness of breath, coughing up blood and wheezing.
May be mildly irritating to skin, eyes and respiratory system. Exposure may cause temporary irritation, redness or discomfort. May cause coughing and breathing difficulties.
Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Ingestion of larger amounts may cause defects to the central nervous system (e.g. dizziness, headache).
Prolonged overexposure may cause slight liver and kidney effects, such as increased organ weights.
Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

Indication of any immediate medical attention and special treatment needed

: Provide general supportive measures and treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Carbon dioxide (CO2); Dry chemical; Alcohol resistant foam.

Unsuitable extinguishing media

: May react with water. Do not use water if possible.

Special hazards arising from the substance or mixture / Conditions of flammability

: Flammable liquid and vapor. May be ignited by open flame. May react with water, generating heat. May hydrolyze in the presence of water to Methanol. Upon completion of the curing process, these hydrolysis products are no longer released. After prolonged storage, may release explosive peroxides in the presence of air. Rate of peroxide formation is not known. The pressure in sealed containers can increase under the influence of heat.

Flammability classification (OSHA 29 CFR 1910.106)

: Flammable liquid - Category 3

Hazardous combustion products

: Carbon oxides; Metal oxides; formaldehyde; Phenols; Aldehydes; Other unidentified organic compounds

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

Special fire-fighting procedures

: Move containers from fire area if safe to do so. Cool closed containers exposed to fire with water spray. Do not get water inside containers. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

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SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Wear appropriate protective equipment. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Prevent product from entering drains, sewers, waterways and soil. Avoid release to the environment.

Methods and material for containment and cleaning up

: Ventilate the area. Remove all sources of ignition. Prevent further leakage or spillage if safe to do so. Use only non-sparking tools. For spilled liquids: absorb spill with inert, non-combustible material such as sand, then place into suitable containers. Do not use combustible absorbents, such as sawdust. Pick up and transfer to properly labeled containers. Contaminated absorbent material may pose the same hazards as the spilled product. Contact the proper local authorities.

Special spill response procedures

: If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the National Response Center in the United States (phone: 1-800-424-8802).
US CERCLA Reportable quantity (RQ): silver (1000 lbs / 454 kg)

In Canada: Contact appropriate local and provincial environmental authorities for assistance and/or reporting requirements.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Persons with recurrent skin eczema or sensitization problems should be excluded from working with this product. Once a person is sensitized, no further exposure to the material that caused the sensitization should be permitted.
Provide adequate ventilation. Wear suitable protective equipment during handling. Wear protective gloves/clothing and eye/face protection. Avoid breathing dust or spray mist. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks and open flame - No smoking. Ground/Bond container and receiving equipment. Use explosion-proof electrical and ventilating equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep away from incompatibles. Keep containers tightly closed when not in use. Wash thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Empty containers retain residue (liquid and/or vapour) and can be dangerous.

Conditions for safe storage : Store in cool/well-ventilated place. Store locked up. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking. Have appropriate fire extinguishers and spill clean-up equipment in or near storage area. Do not store near any incompatible materials (see Section 10). Keep containers dry and tightly closed to avoid moisture absorption and contamination.

Incompatible materials : Strong oxidizing agents; Strong acids; Strong bases; Water; Amines

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SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
silver	0.1 mg/m³ (dust and fume)	N/Av	0.01 mg/m³	N/Av
Bisphenol A / epichlorohydrin resin	N/Av	N/Av	N/Av	N/Av
n-Butyl glycidyl ether	3 ppm	N/Av	50 ppm (270 mg/m³)	N/Av
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	N/Av	N/Av	N/Av	N/Av

Exposure controls

Ventilation and engineering measures : Provide adequate ventilation. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection : If airbourne concentrations are above the permissible exposure limit or are not known, use NIOSH-approved respirators. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

Skin protection : Wear protective gloves/clothing. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear resistant clothing and boots.

Eye / face protection : Wear eye/face protection. Wear as appropriate: Safety glasses with side shields; Tightly fitting safety goggles. A full face shield may also be necessary.

Other protective equipment : Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

General hygiene considerations : Avoid breathing dust, fume or vapors. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice. Contaminated work clothing must not be allowed out of the workplace.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Silver paste.
Odour : Solvent odor.
Odour threshold : N/Av
pH : N/Av
Melting Point/Freezing point : N/Av
Initial boiling point and boiling range : > 110°C (230°F) (based on ingredients)
Flash point : 54.4°C (130°F) (based on ingredients)
Flashpoint (Method) : closed cup
Evaporation rate (BuAe = 1) : N/Av

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Flammability (solid, gas) : Not applicable.
Lower flammable limit (% by vol.)
: N/Av
Upper flammable limit (% by vol.)
: N/Av
Oxidizing properties : None.
Explosive properties : Not explosive
Vapour pressure : N/Av
Vapour density : N/Av
Relative density / Specific gravity
: > 1
Solubility in water : Negligible.. May react with water.
Other solubility(ies) : N/Av
Partition coefficient: n-octanol/water or Coefficient of water/oil distribution
: N/Av
Auto-ignition temperature : N/Av
Decomposition temperature : N/Av
Viscosity : N/Av
Volatiles (% by weight) : N/Av
Volatile organic Compounds (VOC's)
: 0 g/L
Absolute pressure of container
: N/Ap
Flame projection length : N/Ap
Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : May react with water. May hydrolyze in the presence of water to Methanol. Upon completion of the curing process, these hydrolysis products are no longer released.
Chemical stability : Stable under normal conditions. After prolonged storage, may release explosive peroxides in the presence of air. Rate of peroxide formation is not known.
Possibility of hazardous reactions
: Hazardous polymerization does not occur.
Conditions to avoid : Direct sources of heat. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials. Avoid excessive moisture.
Incompatible materials : Strong oxidizing agents; Strong acids; Strong bases; Water; Amines.
Hazardous decomposition products
: Peroxides Refer also to hazardous combustion products, Section 5.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES
Routes of entry skin & eye : YES
Routes of entry ingestion : YES
Routes of exposure skin absorption
: YES

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Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

: Mild respiratory irritant. May cause coughing and breathing difficulties. Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.

Sign and symptoms ingestion

: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion of larger amounts may cause defects to the central nervous system (e.g. dizziness, headache).

Sign and symptoms skin : May cause mild skin irritation. Exposure may cause temporary irritation, redness or discomfort.

Sign and symptoms eyes : Direct eye contact may cause slight or mild, transient irritation. Exposure may cause temporary irritation, redness or discomfort.

Potential Chronic Health Effects

: Prolonged overexposure may cause slight liver and kidney effects, such as increased organ weights.

Mutagenicity : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Germ cell mutagenicity - Category 2. Suspected of causing genetic defects.
Contains: n-Butyl glycidyl ether. n-Butyl glycidyl ether has been tested in a range of short-term genotoxicity tests with positive results in several assays. In vivo, it induced chromosomal aberrations and micronucleus formation in mice, and induced dominant lethal mutations in mice. n-Butyl glycidyl ether also tested positive in a number of in vitro genotoxicity assays. Reverse mutations were observed in several, but not all, strains of Salmonella typhimurium, with and without activation. n-butyl glycidyl ether induced mutations in mouse lymphoma cells, Chinese hamster cells and human peripheral blood lymphocytes.

Carcinogenicity : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Carcinogenicity - Category 2. Suspected of causing cancer. Contains: n-Butyl glycidyl ether. The potential of the epoxy ring contained in the glycidyl group to interact with DNA suggests a genotoxic mechanism of carcinogenicity. The possibility that n-butyl glycidyl ether could act as a direct carcinogen is supported by the available genotoxicity data for its analogues (allyl glycidyl ether, glycidol, phenyl glycidyl ether). There is equivocal evidence of carcinogenicity in male rats, some evidence in male mice and equivocal evidence in female mice for allyl glycidyl ether. There is stronger evidence for carcinogenicity for glycidol, as it induced tumours in a wide range of tissues in multiple species exposed via oral administration. Exposure-related nasal tumours were observed at the higher concentration only of phenyl glycidyl ether.
No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

Reproductive effects & Teratogenicity

: This product is not expected to cause reproductive or developmental effects.

Sensitization to material : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Skin sensitization - Category 1. May cause an allergic skin reaction.
May cause severe skin sensitization with allergic contact dermatitis symptoms such as swelling, rash and eczema.
Not expected to be a respiratory sensitizer.

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Specific target organ effects : According to the classification criteria of U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015), this product is not expected to cause target organ toxicity through single or repeated exposures.

Medical conditions aggravated by overexposure
: Pre-existing eye, skin, respiratory, liver, kidney and central nervous system disorders.

Synergistic materials : None known or reported by the manufacturer.

Toxicological data : Not classified for acute toxicity based on available data. No data is available on the product itself. The calculated ATE values for this mixture are:
ATE oral = 97,647 mg/kg
ATE dermal = 126,471 mg/kg
ATE inhalation (vapours) = 810 mg/L/4H

See below for individual ingredient acute toxicity data.

Chemical name	LC_{50}(4hr) Inh, rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
silver	> 5.16 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	> 2000 mg/kg (No mortality)
Bisphenol A / epichlorohydrin resin	N/Av	11 400 mg/kg	> 2000 mg/kg (No mortality)
n-Butyl glycidyl ether	2590 ppm (13.77 mg/L) (vapour)	1660 mg/kg	> 2150 mg/kg
[3-(2,3-epoxypropoxy)propyl]tri-methoxysilane	> 5.3 mg/L (aerosol)	7010 - 16 900 mg/kg	4280 mg/kg

Other important toxicological hazards
: Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity : Toxic to aquatic life with long lasting effects. No data is available on the product itself. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. The product contains the following substances which are hazardous for the environment: Bisphenol A / epichlorohydrin resin.

This product also contains: Silver The acute toxicity of silver to aquatic species varies drastically by the chemical form and correlates with the availability of free ionic silver. Aquatic toxicity is highly variable not only by organism but with physical and chemical characteristics of the water itself.

See the following tables for individual ingredient ecotoxicity data.

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Ecotoxicity data:

Ingredients	CAS #	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Bisphenol A / epichlorohydrin resin	25068-38-6	3.6 mg/L (Rainbow trout)	N/Av	None.
n-Butyl glycidyl ether	2426-08-6	65 mg/L (Rainbow trout)	N/Av	None.
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	55 mg/L (common carp)	N/Av	None.

Ingredients	CAS #	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Bisphenol A / epichlorohydrin resin	25068-38-6	1.1 - 2.8 mg/L (Daphnia magna)	0.3 mg/L (Read-across)	None.
n-Butyl glycidyl ether	2426-08-6	3.9 mg/L (Daphnia magna)	N/Av	None.
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	710 mg/L (Daphnia magna)	≥ 100 mg/L	None.

Ingredients	CAS #	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Bisphenol A / epichlorohydrin resin	25068-38-6	9.4 mg/L/72hr (Green algae) (Read-across)	2.8 mg/L/72hr (Read-across)	None.
n-Butyl glycidyl ether	2426-08-6	35 mg/L/96hr (Green algae)	N/Av	None.
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	350 mg/L/96hr (Green algae)	130 mg/L/96hr	None.

Persistence and degradability : The product itself has not been tested.
The following ingredients are considered to be readily biodegradable: n-Butyl glycidyl ether.
Contains the following chemicals which are not readily biodegradable: silver; Bisphenol A / epichlorohydrin resin; [3(2,3-epoxypropoxy)propyl]trimethoxysilane.

Bioaccumulation potential : The product itself has not been tested. See the following data for ingredient information.

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Components	Partition coefficient n-octanol/water (log Kow)	Bioconcentration factor (BCF)
Bisphenol A / epichlorohydrin resin (CAS 25068-38-6)	> 2.915	31
n-Butyl glycidyl ether (CAS 2426-08-6)	0.63	1.173 - 3.162 (calculated)
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane (CAS 2530-83-8)	- 0.9	Not expected to bioaccumula

Mobility in soil : The product itself has not been tested.

Other Adverse Environmental effects

: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13. DISPOSAL CONSIDERATIONS

Handling for Disposal : Handle in accordance with good industrial hygiene and safety practice. Refer to protective measures listed in sections 7 and 8. This material and its container must be disposed of in a safe way.
Empty containers retain residue and can be dangerous. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Methods of Disposal : Dispose in accordance with all applicable federal, state, provincial and local regulations.

RCRA : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

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SECTION 14: TRANSPORT INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
49CFR/DOT	UN1993	FLAMMABLE LIQUID, N.O.S. (n-Butyl glycidyl ether)	3	III	
49CFR/DOT Additional Information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 Litres; in packages not exceeding 30 kg gross mass. Refer to 49 CFR Section 173.150.				
TDG	UN1993	FLAMMABLE LIQUID, N.O.S. (n-Butyl glycidyl ether)	3	III	
TDG Additional Information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 Litres; in packages not exceeding 30 kg gross mass. Under the TDG, refer to Section 1.17 for additional exemption requirements, if shipping under this exemption.				
ICAO/IATA	UN1993	Flammable liquid, n.o.s. (n-Butyl glycidyl ether)	3	III	
ICAO/IATA Additional Information	Refer to the appropriate Packing Instruction, prior to shipping this material. Review all State and Operator Variations, prior to shipping this material.				
IMDG	UN1993	FLAMMABLE LIQUID, N.O.S. (n-Butyl glycidyl ether)	3	III	
IMDG Additional Information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 Litres; in packages not exceeding 30 kg gross mass.				

Special precautions for user : Appropriate advice on safety must accompany the package. Keep away from heat, sparks and open flame - No smoking. Avoid release to the environment.

Environmental hazards : This product meets the criteria for an environmentally hazardous material according to the IMDG Code. See Section 12 for more environmental information.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not applicable.

SECTION 15: REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

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Ingredients	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
silver	7440-22-4	Yes	1000 lb/454 kg	None.	Yes	1%
Bisphenol A / epichlorohydrin resin	25068-38-6	Yes	None.	None.	No	N/Ap
n-Butyl glycidyl ether	2426-08-6	Yes	None.	None.	No	N/Ap
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	Yes	None.	None.	No	N/Ap

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Flammable liquid; Skin sensitization; Germ cell mutagenicity; Carcinogenicity

US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

Ingredients	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
silver	7440-22-4	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Bisphenol A / epichlorohydrin resin	25068-38-6	No	N/Ap	No	No	No	No	No	No
n-Butyl glycidyl ether	2426-08-6	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	No	N/Ap	No	No	No	No	No	No

Canadian Information:

Canadian Environmental Protection Act (CEPA) Information: All ingredients listed appear on the Domestic Substances List (DSL).

International Information:

Components listed below are present on the following International Inventory list:

Ingredients	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
silver	7440-22-4	231-131-3	Present	Present	Not listed	KE-31261	Present	HSR003077
Bisphenol A / epichlorohydrin resin	25068-38-6	500-033-5	Present	Present	(7)-1283	KE-24000	Present	HSR003180
n-Butyl glycidyl ether	2426-08-6	219-376-4	Present	Present	(2)-392	KE-04158	Present	HSR002921
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	219-784-2	Present	Present	(2)-2071	KE-34368	Present	HSR003830

SECTION 16: OTHER INFORMATION

Legend : ACGIH: American Conference of Governmental Industrial Hygienists
AICS: Australian Inventory of Chemical Substances

SAFETY DATA SHEET

CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
CSA: Canadian Standards Association
DOT: Department of Transportation
EC50: Effective Concentration 50%
ENCS: Existing and New Chemical Substances
EPA: Environmental Protection Agency
IARC: International Agency for Research on Cancer
IECSC: Inventory of Existing Chemical Substances
IMDG: International Maritime Dangerous Goods
IOC: Inventory of Chemicals
KECI: Korean Existing Chemicals Inventory
KECL: Korean Existing Chemicals List
LC: Lethal Concentration
LD: Lethal Dose
N/Ap: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
PICCS: Philippine Inventory of Chemicals and Chemical Substances
SARA: Superfund Amendments and Reauthorization Act
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices
2. ECHA - European Chemical Agency
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases
4. Safety Data Sheets from manufacturer.
5. US EPA Title III List of Lists
6. California Proposition 65 List
7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal

Preparation Date (mm/dd/yyyy) : 05/15/2009

Reviewed Date SDS (dd/mm/yyyy) : 27/06/2023

Revision No. : 3

Revision Information : All sections modified.

Other special considerations for handling : Provide adequate information, instruction and training for operators.

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SAFETY DATA SHEET

Prepared for: Parker Hannifin Corp. Chomerics Division 77 Dragon Court Woburn, MA, U.S.A. 01888 Telephone: (781) 935-4850	Parker Chomerics
Prepared by: ICC The Compliance Center Inc. Telephone: (888) 442-9628 (U.S.): (888) 977-4834 (Canada) http://www.thecompliancecenter.com	ICC ComplianceCenter

DISCLAIMER

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This Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of ICC The Compliance Center Inc. and Parker Hannifin Corporation.

END OF DOCUMENT

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SECTION 1. IDENTIFICATION

Product identifier used on the label
: **Silver-Filled Epoxy Systems Part 2**

Other means of identification : 72-08116-2; 72-00218A; 72-00348A; 72-90005B; 72-11011

Recommended use of the chemical and restrictions on use
: Bonding agent.
: No restrictions on use known.

Chemical family : Mixture of: Inorganic substances in powdered form; Amines; Alcohol

SDS number : PHC-002

Name, address, and telephone number of the manufacturer:

Parker Hannifin Corp.
Chomerics Division
77 Dragon Court
Woburn, MA, USA
01888

Manufacturer's Telephone # : (781) 935-4850

24 Hr. Emergency Tel # : INFOTRAC - (800) 535-5053 (Within Continental US); (352) 323-3500 (Outside US)

Name, address, and telephone number of the supplier:

Refer to manufacturer

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Silver paste. Solvent odor.

Most important hazards:
Irritating to skin. Causes serious eye damage. May cause an allergic skin reaction. Suspected of causing cancer. Irritating to respiratory system. Causes damage to organs through prolonged or repeated exposure. Occupational exposure to the substance or mixture may cause adverse effects. For further information, please refer to section 11 of the SDS.
Harmful to aquatic life with long lasting effects. Avoid release to the environment. See Section 12 for more environmental information.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
- Skin corrosion/irritation - Category 2
- Eye damage/irritation - Category 1
- Skin sensitization - Category 1
- Carcinogenicity - Category 2
- Specific target organ toxicity, single exposure - Category 3
- Specific target organ toxicity, repeated exposure - Category 1

Label elements

Hazard pictogram(s)

Signal Word

DANGER!

Hazard statement(s)

Causes skin irritation.
Causes serious eye damage.
May cause an allergic skin reaction.
Suspected of causing cancer.
May cause respiratory irritation.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, fume or vapor. Wash hands and face thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/clothing and eye/face protection.
IF exposed or concerned: Get medical advice/attention.
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Dispose of contents/container in accordance with local regulation.

Other hazards

Other hazards which do not result in classification:
Toxic fumes, gases or vapours may evolve on burning. Inhalation of fumes may result in metal fume fever, a flu-like illness. May cause gastrointestinal irritation. Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Chemical name	Common name and synonyms	CAS #	Concentration (% by weight)
silver	Silver metal Argentum	7440-22-4	**65.0 - 85.0**
Polyamide resin	Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine	68082-29-1	**10.0 - 30.0**
Furfuryl Alcohol	2-Furylcarbinol 2-Furylmethanol 2-Hydroxymethylfuran	98-00-0	**1.0 - 5.0**
Triethylenetetramine	N,N'-Bis(2-aminoethyl)ethylene diamine TETA	112-24-3	**1.0 - 5.0**

The exact concentrations of the above listed chemicals are being withheld as a trade secret.

SECTION 4: FIRST-AID MEASURES

Description of first aid measures

Ingestion : Do NOT induce vomiting. Never give anything by mouth to a person who is unconscious or is having convulsions. IF exposed or concerned: Get medical advice/attention.

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Inhalation : If inhaled: Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing stops, provide artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact : IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Most important symptoms and effects, both acute and delayed

: Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause irreversible eye damage.
May cause severe skin sensitization with allergic contact dermatitis symptoms such as swelling, rash and eczema.
Suspected of causing cancer. Symptoms may include persistent coughing, shortness of breath, coughing up blood and wheezing.
May cause respiratory irritation. Symptoms may include coughing, choking and wheezing. Exposure to low vapour concentrations may cause swelling (edema) of the eyes, resulting in blurring of vision with a bluish haze and/or appearance of halos around lights.
Causes damage to organs through prolonged or repeated exposure. Signs and symptoms may include lesions of the nasal cavity (inflammation, bloody discharge), and liver and kidney lesions (jaundice; blood in urine, abdominal pain, fatigue, etc).
Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Ingestion of larger amounts may cause defects to the central nervous system (e.g. dizziness, headache).

Indication of any immediate medical attention and special treatment needed

: Immediate medical attention is required. Causes serious eye damage.
Provide general supportive measures and treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.

Unsuitable extinguishing media

: None known.

Special hazards arising from the substance or mixture / Conditions of flammability

: Not considered flammable. However, may burn if exposed to extreme heat and flame. Vapours are heavier than air and collect in confined and low-lying areas. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Toxic fumes, gases or vapors may evolve on burning.

Flammability classification (OSHA 29 CFR 1910.106)

: Not classified as flammable.

Hazardous combustion products

: Carbon oxides; Metal oxides; Nitrogen oxides (NOx); Ammonia; hydrogen cyanide; Amines; Aldehydes; Other unidentified organic compounds

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

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: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

Special fire-fighting procedures

: Move containers from fire area if safe to do so. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Wear appropriate protective equipment. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Prevent product from entering drains, sewers, waterways and soil. Avoid release to the environment.

Methods and material for containment and cleaning up

: Ventilate the area. Remove all sources of ignition. Prevent further leakage or spillage if safe to do so. Use only non-sparking tools. For spilled liquids: absorb spill with inert, non-combustible material such as sand, then place into suitable containers. Do not use combustible absorbents, such as sawdust. Pick up and transfer to properly labeled containers. Contaminated absorbent material may pose the same hazards as the spilled product. Contact the proper local authorities.

Special spill response procedures

: If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the National Response Center in the United States (phone: 1-800-424-8802).
US CERCLA Reportable quantity (RQ): silver (1000 lbs / 454 kg)

In Canada: Contact appropriate local and provincial environmental authorities for assistance and/or reporting requirements.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Persons with recurrent skin eczema or sensitization problems should be excluded from working with this product. Once a person is sensitized, no further exposure to the material that caused the sensitization should be permitted.
Use only outdoors or in a well-ventilated area. Wear suitable protective equipment during handling. Do not breathe dust, fume or vapor. Wear protective gloves and eye/face protection. Avoid contact with skin, eyes and clothing. Keep away from extreme heat and direct flame. Keep away from incompatibles. Keep containers tightly closed when not in use. Wash thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Empty containers retain residue (liquid and/or vapour) and can be dangerous.

Conditions for safe storage : Store in cool/well-ventilated place. Store locked up. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Do not store near any incompatible materials (see Section 10).

Incompatible materials : Strong oxidizing agents; Strong acids; Strong bases; Reactive metals; Water; Aldehydes; Ketones; Halogenated compounds; Nitrogen compounds

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

Chemical Name	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
silver	0.1 mg/m³ (dust and fume)	N/Av	0.01 mg/m³	N/Av
Polyamide resin	N/Av	N/Av	N/Av	N/Av
Furfuryl Alcohol	0.2 ppm (skin)	N/Av	50 ppm (200 mg/m³)	N/Av
Triethylenetetramine	1 ppm (AIHA WEEL) (skin)	N/Av	N/Av	N/Av

Exposure controls

Ventilation and engineering measures : Use only outdoors or in a well-ventilated area. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection : If airbourne concentrations are above the permissible exposure limit or are not known, use NIOSH-approved respirators. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

Skin protection : Wear protective gloves/clothing. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear resistant clothing and boots.

Eye / face protection : Wear eye/face protection. Chemical splash goggles are recommended. A full face shield may also be necessary.

Other protective equipment : Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

General hygiene considerations : Do not breathe dust, fume or vapor. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice. Contaminated work clothing must not be allowed out of the workplace.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Silver paste.
Odour : Solvent odor.
Odour threshold : N/Av
pH : N/Av
Melting Point/Freezing point : N/Av
Initial boiling point and boiling range : > 170°C (338°F) (based on ingredients)
Flash point : > 100°C (212°F) (based on ingredients)
Flashpoint (Method) : closed cup
Evaporation rate (BuAe = 1) : N/Av
Flammability (solid, gas) : Not applicable.

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Lower flammable limit (% by vol.)
: N/Av

Upper flammable limit (% by vol.)
: N/Av

Oxidizing properties : None.

Explosive properties : Not explosive

Vapour pressure : < 1 mmHg

Vapour density : > 1 (Air = 1)

Relative density / Specific gravity
: > 1

Solubility in water : Slightly soluble.

Other solubility(ies) : N/Av

Partition coefficient: n-octanol/water or Coefficient of water/oil distribution
: N/Av

Auto-ignition temperature : N/Av

Decomposition temperature : N/Av

Viscosity : N/Av

Volatiles (% by weight) : N/Av

Volatile organic Compounds (VOC's)
: 0 g/L

Absolute pressure of container
: N/Ap

Flame projection length : N/Ap

Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions
: Hazardous polymerization does not occur.

Conditions to avoid : Direct sources of heat. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.

Incompatible materials : Strong oxidizing agents; Strong acids; Reactive metals; Aldehydes; Ketones; Halogenated compounds; Nitrogen compounds

Hazardous decomposition products
: None known, refer to hazardous combustion products in Section 5.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES

Routes of entry skin & eye : YES

Routes of entry Ingestion : YES

Routes of exposure skin absorption
: YES

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Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

: May cause respiratory irritation. Symptoms may include coughing, choking and wheezing. Exposure to low vapour concentrations may cause swelling (edema) of the eyes, resulting in blurring of vision with a bluish haze and/or appearance of halos around lights. Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.

Sign and symptoms ingestion

: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion of larger amounts may cause defects to the central nervous system (e.g. dizziness, headache).

Sign and symptoms skin : Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Can be absorbed through skin.

Sign and symptoms eyes : Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include stinging, tearing, redness, swelling and blurred vision. May cause irreversible eye damage.

Potential Chronic Health Effects

: Silver in the form of a finely divided dust may cause discoloration in contact with skin, and argyrosis in case of inhalation.

Mutagenicity : No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Carcinogenicity - Category 2. Suspected of causing cancer.
Contains: Furfuryl Alcohol. Furfuryl alcohol is classified as possibly carcinogenic to humans by IARC (Group 2B), and the ACGIH (Category A3).

Reproductive effects & Teratogenicity

: This product is not expected to cause reproductive or developmental effects.

Sensitization to material : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Skin sensitization - Category 1. May cause an allergic skin reaction.
May cause severe skin sensitization with allergic contact dermatitis symptoms such as swelling, rash and eczema.
Not expected to be a respiratory sensitizer.

Specific target organ effects : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Specific target organ toxicity, single exposure - Category 3. May cause respiratory irritation.

Specific target organ toxicity, repeated exposure - Category 1. Causes damage to organs through prolonged or repeated exposure. Signs and symptoms may include lesions of the nasal cavity (inflammation, bloody discharge), and liver and kidney lesions (jaundice, blood in urine, abdominal pain, fatigue, etc).

Medical conditions aggravated by overexposure

: Pre-existing eye, skin, respiratory, liver, kidney and central nervous system disorders.

Synergistic materials : None known or reported by the manufacturer.

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Toxicological data : Not classified for acute toxicity based on available data. No data is available on the product itself. The calculated ATE values for this mixture are:
ATE oral = 3570 mg/kg
ATE dermal = 10,577 mg/kg
ATE inhalation (vapours) = 26 mg/L/4H

See below for individual ingredient acute toxicity data.

Chemical name	LC_{50}(4hr) inh, rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
silver	> 5.16 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	> 2000 mg/kg (No mortality)
Polyamide resin	N/Av	> 2000 mg/kg (No mortality)	> 2000 mg/kg (No mortality)
Furfuryl Alcohol	233 ppm (0.935mg/L) (vapour)	132 mg/kg	657 mg/kg
Triethylenetetramine	N/Av	4340 mg/kg	805 mg/kg

Other important toxicological hazards
: None known or reported by the manufacturer.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity : Harmful to aquatic life with long lasting effects. No data is available on the product itself. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. The product contains the following substances which are hazardous for the environment: Polyamide resin; Triethylenetetramine.

This product also contains: Silver. The acute toxicity of silver to aquatic species varies drastically by the chemical form and correlates with the availability of free ionic silver. Aquatic toxicity is highly variable not only by organism but with physical and chemical characteristics of the water itself.

See the following tables for individual ingredient ecotoxicity data.

Ecotoxicity data:

Ingredients	CAS #	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Polyamide resin	68082-29-1	7.07 mg/L (Zebra fish)	N/Av	None.
Furfuryl Alcohol	98-00-0	361.959 mg/L (QSAR)	N/Av	None.
Triethylenetetramine	112-24-3	570 mg/L (Guppy)	N/Av	None.

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Ingredients	CAS #	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Polyamide resin	68082-29-1	7.07 mg/L (Daphnia magna)	N/Av	None.
Furfuryl Alcohol	98-00-0	223.76 mg/L (QSAR)	N/Av	None.
Triethylenetetramine	112-24-3	31.1 mg/L (Daphnia magna)	N/Av	None.

Ingredients	CAS #	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
silver	7440-22-4	N/Av	N/Av	None.
Polyamide resin	68082-29-1	4.34 mg/L/72hr (Green algae)	0.5 mg/L/72hr	None.
Furfuryl Alcohol	98-00-0	170.278 mg/L/96hr (QSAR)	N/Av	None.
Triethylenetetramine	112-24-3	20 mg/L/72hr (Green algae)	N/Av	None.

Persistence and degradability
: The product itself has not been tested.
The following ingredients are considered to be readily biodegradable: Furfuryl Alcohol.
Contains the following chemicals which are not readily biodegradable: silver; Triethylenetetramine; Polyamide resin.

Bioaccumulation potential : The product itself has not been tested. See the following data for ingredient information.

Components	Partition coefficient n-octanol/water (log Kow)	Bioconcentration factor (BCF)
Polyamide resin (CAS 68082-29-1)	10.34	77.4 (QSAR)
Furfuryl Alcohol (CAS 98-00-0)	0.28	3.2
Triethylenetetramine (CAS 112-24-3)	- 1.4	Not expected to bioaccumula

Mobility in soil : The product itself has not been tested.

Other Adverse Environmental effects
: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13: DISPOSAL CONSIDERATIONS

Handling for Disposal : Handle in accordance with good industrial hygiene and safety practice. Refer to protective measures listed in sections 7 and 8. This material and its container must be disposed of in a safe way.
Empty containers retain residue and can be dangerous. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Methods of Disposal : Dispose in accordance with all applicable federal, state, provincial and local regulations.

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RCRA : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

SECTION 14: TRANSPORT INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
49CFR/DOT	None.	Not regulated.	not regulated	none	
49CFR/DOT Additional Information	None.				
TDG	None.	Not regulated.	not regulated	none	
TDG Additional Information	None.				
ICAO/IATA	None.	Not regulated.	not regulated	none	
ICAO/IATA Additional Information	None.				
IMDG	None.	Not regulated.	not regulated	none	
IMDG Additional Information	None.				

Special precautions for user : Appropriate advice on safety must accompany the package.

Environmental hazards : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See Section 12 for more environmental information.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not applicable.

SECTION 15: REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

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Ingredients	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
silver	7440-22-4	Yes	1000 lb/454 kg	None.	Yes	1%
Polyamide resin	68082-29-1	Yes	None.	None.	No	N/Ap
Furfuryl Alcohol	98-00-0	Yes	None.	None.	No	N/Ap
Triethylenetetramine	112-24-3	Yes	None.	None.	No	N/Ap

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Skin irritation; Eye Damage; Skin sensitization; Carcinogenicity; Specific target organ toxicity, single exposure; Specific target organ toxicity, repeated exposure

US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

Ingredients	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
silver	7440-22-4	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Polyamide resin	68082-29-1	No	N/Ap	No	No	No	No	No	No
Furfuryl Alcohol	98-00-0	Yes	Cancer	Yes	Yes	Yes	Yes	Yes	Yes
Triethylenetetramine	112-24-3	No	N/Ap	No	Yes	No	Yes	Yes	No

Canadian Information:

Canadian Environmental Protection Act (CEPA) Information: All ingredients listed appear on the Domestic Substances List (DSL).

International Information:

Components listed below are present on the following International Inventory list:

Ingredients	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
silver	7440-22-4	231-131-3	Present	Present	Not listed	KE-31261	Present	HSR003077
Polyamide resin	68082-29-1	500-191-5	Present	Present	(7)-401	KE-16791	Present	May be used as a single component chemical under an appropriate group standard.
Furfuryl Alcohol	98-00-0	202-626-1	Present	Present	(5)-31	KE-17364	Present	HSR002998
Triethylenetetramine	112-24-3	203-950-6	Present	Present	(2)-163	KE-02911	Present	HSR003570

SECTION 16: OTHER INFORMATION

Legend : ACGIH: American Conference of Governmental Industrial Hygienists

SAFETY DATA SHEET

AICS: Australian Inventory of Chemical Substances
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
CSA: Canadian Standards Association
DOT: Department of Transportation
EC50: Effective Concentration 50%
ENCS: Existing and New Chemical Substances
EPA: Environmental Protection Agency
IARC: International Agency for Research on Cancer
IECSC: Inventory of Existing Chemical Substances
IMDG: International Maritime Dangerous Goods
IOC: Inventory of Chemicals
KECI: Korean Existing Chemicals Inventory
KECL: Korean Existing Chemicals List
LC: Lethal Concentration
LD: Lethal Dose
N/Ap: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
PICCS: Philippine Inventory of Chemicals and Chemical Substances
SARA: Superfund Amendments and Reauthorization Act
STEL: Short Term Exposure Limit
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References : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices
2. ECHA - European Chemical Agency
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases
4. Safety Data Sheets from manufacturer.
5. US EPA Title III List of Lists
6. California Proposition 65 List
7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal

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Other special considerations for handling : Provide adequate information, instruction and training for operators.

SAFETY DATA SHEET

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