

Safety Data Sheet

Conductive Epoxy

1. Product And Company Identification

Product Name: Conductive Epoxy - Part A (Adhesive)
Manufactured For: Planned Products LLC
4699 Nautilus Court S. Suite 201
Boulder, CO 80301
Information Tel: (303) 682-0274
Trade Name: Frost Fighter® Conductive Epoxy - Part A (Adhesive)
Material Uses: Conductive Adhesive in 2-Component Epoxy
Code: 2000 - A
Validation Date: 03-31-15
In Case Of An Emergency: Emergency Telephone: INFOTRAC 1-800-535-5053
Outside the U.S. Call collect: 1-352-323-3500
Product Type: Solid.

2. Hazards Identification

Emergency Overview

Physical State: Liquid. [Paste.]
Color: Silver/Gray.
Odor: Mild.
Signal Word: WARNING!
Hazard Statements: CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.
Precautionary Measures: Do not breathe vapor or mist. Do not eat, drink, or smoke when using this product. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.
OSHA/HCS Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential Acute Health Effects

Inhalation: No known significant effects or critical hazards.
Ingestion: Silver ingestion may result in generalized argyria.
Skin: Severely irritating to the skin. May cause sensitization by skin contact.
Eyes: Severely irritating to eyes. Risk of serious damage to eyes.

Acute Chronic Health Effects

Chronic Effects: Contains material that can cause target organ damage.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental Effects: No known significant effects or critical hazards.
Fertility Effects: No known significant effects or critical hazards.
Target Organs: Contains material which causes damage to the following organs: eye, lens or cornea. Contains material which may cause damage to the following organs: mucous membranes, upper respiratory tract, skin, nose/sinuses, testes.

Over-Exposure Signs/Symptoms

Inhalation: No specific data.
Ingestion: Adverse symptoms may include the following:
- generalized argyria
Skin: Adverse symptoms may include the following:
- irritation, redness
Eyes: Adverse symptoms may include the following:
- pain or irritation, watering, redness
Medical Conditions Aggravated by Over-Exposure: Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

See Toxicological Information (Section 11)

3. Composition/Information On Ingredients

Name	CAS Number	%
Silver	7440-22-4	60 - 90
Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin	25068-38-6	10 - 40

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First Aid Measures

Eye Contact: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical

attention immediately.

Inhalation:

Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion:

Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of First-Aiders:

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to Physician:

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-Fighting Measures

Flammability of the Product:

In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing Media

Suitable:

Use an extinguishing agent suitable for the surrounding fire.

Not Suitable:

None known.

Special Exposure Hazards:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous Thermal Decomposition Products:

Decomposition products may include the following materials:
- carbon dioxide, carbon monoxide, halogenated compounds, metal oxide/oxides.

Special Protective Equipment for Fire-Fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measures

Personal Precautions:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental Precautions:

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways soil or air)

Methods for Cleaning Up

Small Spill:

Stop leak if without risk. Move containers from spill area. Dilute with

Large Spill:

water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

Handling:

Put on appropriate personal protective equipment (see Section 8). Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage:

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure Controls/Personal Protection

Ingredient	Exposure Limits
silver	<p>ACGIH TLV (United States, 3/2012). TWA: 0.1 mg/m³ 8 hours. Form: Dust and fumes</p> <p>NIOSH REL (United States, 1/2013). Notes: as Ag TWA: 0.01 mg/m³, (as Ag) 10 hours. Form: METAL DUST AND SOLUBLE</p> <p>OSHA PEL (United States, 6/2010). Notes: as Ag TWA: 0.01mg/m³, (as Ag) 8 hours.</p> <p>OSHA PEL 1989 (United States, 3/1989). Notes: as Ag TWA: 0.01 mg/m³, (as Ag) 8 hours.</p>

Recommended Monitoring Procedures:

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to

determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering Measures:

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Hygiene Measures:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protection

Respiratory:

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Eyes:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin:

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental Exposure Controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical And Chemical Properties

Physical State:

Liquid. [Paste.]

Flash Point:

Closed cup: >93.3°C (>199.9°F) [Setaflash.]

Color:

Silver/Gray.

Odor:

Mild.

Boiling/Condensation Point:	>93°C (>199.4°F)
Vapor Pressure:	<0.13 kPa (<1 mm Hg) [room temperature]
Vapor Density:	>1 [Air = 1]
Volatility:	<0.5% (w/w)
Evaporation Rate:	<1 (butyl acetate = 1)
Dispersibility Properties:	Not dispersible in the following materials: cold water, hot water, methanol, diethyl ether, n-octanol and acetone.

10. Stability And Reactivity

Chemical Stability:	The product is stable.
Conditions to Avoid:	Excessive heat.
Incompatible Materials:	Reactive or incompatible with the following materials: oxidizing materials, acids, alkalis, amines, mercaptans.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Carbon dioxide, carbon monoxide, halogenated compounds, metal oxide/oxides.
Possibility of Hazardous Reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicology Information

Acute Toxicity

Conclusion/Summary: Not available

Chronic Toxicity

Conclusion/Summary: Not available

Irritation/Corrosion

Product/Ingredient Name	Result	Species	Score	Exposure	Observation
reaction product: bisphenol-A-(epichlorhydrin); epoxy resin	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 microliters	-
	Skin - Severe irritant	Rabbit	-	24 hours 2 milligrams	-

Conclusion/Summary: Not available

Sensitizer

Conclusion/Summary: Not available

Carcinogenicity

Conclusion/Summary: Not available

Classification

Product/Ingredient Name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Silver	-	-	-	-	-	None.

Mutagenicity

Conclusion/Summary: Not available

Teratogenicity

Conclusion/Summary: Not available

Reproductive Toxicity

Conclusion/Summary: Not available

12. Ecological Information

Ecotoxicity: No known significant effects or critical hazards.

Aquatic Ecotoxicity

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 4500 ppb Fresh Water	Crustaceans - Gammarus pseudolimnaeus	48 hours
	Acute LC50 2.13 to 2.93 µg/l Fresh Water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 5 mg/l Marine Water	Algae - Glenodinium halli	72 hours

Conclusion/Summary: Not available

Persistence/Degradability

Conclusion/Summary: Not available

13. Disposal Considerations

Waste Disposal:

The generation of waste should be avoided or minimized whenever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all

authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CTONROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport Information

Regulatory Information	UN Number	Proper Shipping Name	Classes	PG*	Label	Additional Information
DOT Classification	Not regulated.	Adhesive, sealants	-	-		Reportable Quantity 1333.3 lbs / 605.33 kg [39.003 gal / 147.64 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
TDG Classification	Not regulated.	Adhesive, sealants	-	-		-
Mexico Classification	Not regulated.	Adhesive, sealants	-	-		-
ADR/RID Class	Not regulated.	Adhesive, sealants	-	-		Not regulated.
IMDG Class	Not regulated.	Adhesive, sealants	-	-		Not regulated.
IATA-DGR Class	Not regulated.	Adhesive, sealants	-	-		Not regulated.

PG*: Packing Group

15. Regulatory Information

HCS Classification:

Irritating material
Target organ effects

U.S. Federal Regulations:

TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112

Clean Water Act (CWA) 307: silver
Not listed

(b) Hazardous Air Pollutant (HAPs):

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

SARA 302/304

Composition/Information on ingredients

No products were found

SARA 304 RQ: Not applicable

SARA 311/312

Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/Information on Ingredients

Name	%	Fire Hazard	Sudden Release of Pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Silver	60 - 90	No.	No.	No.	No.	Yes.
reaction product: bisphenol-A-(epichlorhydrin); epoxy resin	10 - 40	No.	No.	No.	Yes.	No.

SARA 313

	Product Name	CAS Number	%
Form R - Reporting Requirements	silver	7440-22-4	60 - 90
Supplier Notification	silver	7440-22-4	60 - 90

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State Regulations

Massachusetts: The following components are listed: SILVER

New York: The following components are listed: Silver

New Jersey: The following components are listed: SILVER

Pennsylvania: The following components are listed: SILVER

Canada Inventory: All components are listed or exempted.

International Regulations

International Lists:
Australia Inventory (AICS): All components are listed or exempted.
China Inventory (IECSC): All components are listed or exempted.
Japan Inventory: Not determined.
Korea Inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines Inventory (PICCS): All components are listed or exempted.
Taiwan Inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals: Not listed

Chemical Weapons Convention List Schedule II Chemicals: Not listed

Chemical Weapons Convention List Schedule III Chemicals: Not listed

16. Other Information

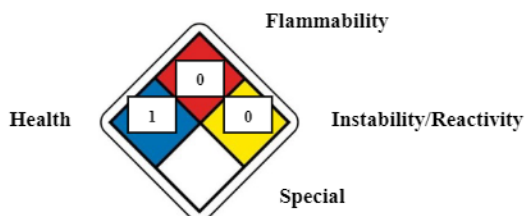
Label Requirements: CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.):

HEALTH	1
FLAMMABILITY	0
REACTIVITY	0

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National Fire Protection Association (U.S.A.):



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