Safety Data Sheet
Product: D-1931A

Version: 1 (US)
Revision Date: August 4, 2015
Prepared in Accordance with: 29CFR 1910.1200

Section 1: Company and Product Identification

Synonym / Other ID / Description: none assigned
Product Use: Conductive Adhesive
Restrictions on Use: Industrial only. Not for consumer use.
Company: **Engineered Materials Systems, Inc.**
132 Johnson Drive
Delaware, Ohio 43015
Telephone: **740-362-4444** (for product information, weekdays 8 a.m.-5 p.m. E.S.T.)
Emergency 24-hr Telephone Number: 1-800-424-9300 (Chemtrec)
703-527-3887 (Chemtrec—International)

Section 2: Hazards Identification

Sample Preparation/Mixture classification:

GHS Classification: 29 CFR1910.1200 (d)	
	Signal Word: Warning
Hazard classification(s)	**Hazard phrases**
Sensitization – skin 1B	**H317:** May cause an allergic skin reaction
Aquatic acute toxicity 1	**H400:** Very toxic to aquatic life
Aquatic chronic toxicity 1	**H410:** Very toxic to aquatic life with long lasting effects
Precautionary Statement (s)	
PREVENTION:	
P261: Avoid breathing dust/fume/gas/mist/ vapors/spray.	
P272: Contaminated work clothing must not be allowed out of the workplace.	
P273: Avoid release to the environment.	
P280: Wear protective gloves.	
RESPONSE:	
P302 + P352: IF ON SKIN: Wash with plenty of water and soap.	
P321: Specific treatment: Not applicable	
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.	
P363: Wash contaminated clothing before reuse.	
P391: Collect spillage.	
DISPOSAL:	
P501: Dispose of contents/container as hazardous waste to an approved waste facility in accordance with local/regional/national/international regulations.	

Hazards Not Otherwise Classified (HNOC): Acute inhalation can cause metal fume fever. This condition may arise within 4-12 hours after exposure. This is characterized by any of the following symptoms: fever, chills, nausea, weakness, body aches, frontal headache, possible blurred vision, low back pain, muscle cramping, shallow respiration, throat dryness/muscle cramping, dry cough, sweet or metallic taste and chest tightness occurring over several hours. Symptoms usually subside within 24 hours.

Section 3: Composition and information on Hazardous Ingredients

Ingredient	CAS #	% Weight
Silver	7440-22-4	50-70*
Reaction product of phenol-formaldehyde Novolac with epichlorohydrin	28064-14-4	20-40*
Trimethylolpropane triglycidyl ether	30499-70-8	1-10*

*Indicates components for which the specific chemical identity or exact percentage has been withheld as a trade secret

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Section 4: First Aid Measures

Eye Contact: Flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Check for and remove any contact lenses. Get medical attention.
Skin Contact: Remove any contaminated clothing and flush the affected area of the skin thoroughly with plenty of water. Follow by washing with soap and water. Get medical attention if irritation persists. Do not reuse contaminated clothing until properly cleaned. Discard items which cannot be decontaminated, including leather items such as shoes, belts, and watchbands.
Ingestion: Dilute by giving plenty of water to drink, if victim is conscious and alert. Never give anything by mouth to a drowsy, unconscious, or convulsing person. Get immediate attention.
Inhalation: Remove victim to fresh air. Provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get immediate medical attention.

Most Important Symptoms/Effects (Acute and Delayed):
Inhalation: Vapor from heated material may cause respiratory irritation.
Skin Contact: May cause skin sensitization characterized by rashes or hives in predisposed individuals.
Eye Contact: Irritation.
Ingestion: Irritation of mouth, throat and stomach.

Notes to physician: Treat symptomatically
Special Hazards: Acute inhalation can cause metal fume fever. This condition may arise within 4-12 hours after exposure. This is characterized by any of the following symptoms: fever, chills, nausea, weakness, body aches, frontal headache, possible blurred vision, low back pain, muscle cramping, shallow respiration, throat dryness/muscle cramping, dry cough, sweet or metallic taste and chest tightness occurring over several hours. Symptoms usually subside within 24 hours.

Section 5: Fire Fighting Measures

Suitable Extinguishing Media: CO_2, dry chemical, water fog, foam
Unsuitable Extinguishing Media: Water stream

Specific Fire or Explosion Hazards: Toxic or irritating fumes may develop when material is exposed to open flame or extreme temperatures. Smoke may contain the original material in addition to combustion products of varying composition, such as phenolics, CO, CO2, and toxic metal oxide smoke.

Special Fire Fighting Procedures:

Protective Equipment: Firefighters/rescue personnel should wear positive pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing. If contact with this material is likely, use full chemical resistant firefighting clothing with SCBA.

Precautions:

Keep people away.
Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles.
Use water spray to cool fire exposed containers and fire affected zones until fire is out and danger of re-ignition has passed.

Environmental Precautions:
Contain fire water run-off to prevent potential environmental damage.

Section 6: Accidental Release Measures

NOTE: Review the entire SDS before proceeding with spill response.

Personal Precautions and Protective Equipment: Ensure adequate ventilation. Keep non-responder personnel at a safe distance and upwind of spill. See handling information in Section 7.

Emergency Procedures:
Spills: Shut off source of the release if this can be done without risk of injury. Dike area to contain the spill and prevent releases to soil, sewers, drains, or other waterways. Collect spilled material for salvage or disposal. Wipe up or absorb spilled material that cannot be recovered, using inert absorbent material. Wash area with soapy water, while containing runoff. Collect and dispose contaminated materials in accordance with current Federal, State, local and Country regulations.

Section 7: Handling and Storage

NOTE: Employees must be properly trained in safe handling of this product prior to use.

Handling
General information on handling:
Avoid breathing vapor or mist.
Avoid prolonged or repeated contact with skin.
Wash thoroughly after handling.
Emptied container retains vapor and product residue.
Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Storage
General information on storage conditions:
Store in a cool, dry location with adequate ventilation. Store in closed containers, in a secure area to prevent container damage and subsequent spillage. Keep container tightly sealed when not in use. Keep away from open flames and heat sources. Consult the product Technical Bulletin for detailed storage information.

Storage stability – Remarks: No dangerous reaction known under conditions of normal use.
Storage incompatibility – General: May react exothermically with amines in large quantity (> 0.5 kg) reactions.
Store separate from: Oxidizers, acids, bases, amines, ammonia, peroxides, acetylenes and other radical forming substances

Temperature tolerance – See Technical Data Sheet

Section 8: Exposure Control / Personal Protection

Personal Protection:
General precautions: Wash hands and face thoroughly after handling this product and before eating, drinking, or smoking. Emergency eye wash facilities and safety shower should be available.

Eye protection: This product may cause eye irritation. Prevent eye contact through the use of chemical safety glasses, splash-proof goggles, or face shields.

Skin protection: This product may cause skin irritation or allergic skin reactions. Wear appropriate gloves that are rated for chemical resistance and breakthrough. Type of glove material, thickness and permeation times must be determined based on type of contact

(splash or immersion) and length of contact. Change gloves frequently during use and watch for signs of degradation/ breakthrough. If necessary, a proper chemical resistant apron and additional impervious protective equipment should be used to prevent skin contact and contamination of clothing. Normal work clothing should be washed before re-use.

Respiratory Protection: Provide effective ventilation to draw emissions away from the worker and prevent routine inhalation. Use an appropriate, properly fitted respirator if exposures exceed PEL/TLV/OEL value listed below. The type of protection selected (SCBA, air purifying, etc.) will depend upon the conditions of use. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Ingestion: Keep product away from food and beverages. Wash hands and face thoroughly after handling this product and before eating, drinking, or smoking.

Occupational Exposure Limits (OELs):

Material	OSHA PEL	ACGIH TLV
Silver	0.01mg/m^3 8 hr. TWA (dust)	0.1mg/m^3 8 hr. TWA (dust)

Section 9: Physical and Chemical Properties

Appearance: Viscous liquid
Color: Silver
Odor: Not available
Odor Threshold: Not available
pH: Not available
Melting Point (°C): Not available
Boiling Point (°C): Not available
Flash point (°C): 218 (based on resin)
Lower explosion Limit: Not determined for this preparation/mixture
Upper explosion Limit: Not determined for this preparation/mixture
Evaporation rate: Not available
Vapor Pressure: Not available
Vapor density: Not available
Specific Gravity/Density: Not available
Solubility: Not available
Partition coefficient: n-octanol/water: no data available
Auto-ignition temperature [NFPA]: no data available
Explosive properties and Oxidizing properties: Refer to Section 10: Stability and Reactivity

Section 10: Stability and Reactivity

Reactivity:	No dangerous reaction known under conditions of normal use. May react exothermically with amines in large quantity (> 0.5 kg) reactions.
Chemical Stability:	Stable in closed containers when stored away from prolonged heat, sparks and flames**.**
Conditions to avoid:	Extremes of temperature and direct sunlight**;** flames and sparks
Incompatible materials:	Prevent contact with oxidizers, acids, bases, amines, ammonia, peroxides, acetylenes and other radical forming substances.
Hazardous Decomposition Products:	Original material in addition to combustion products of varying composition, such as phenolics, CO, CO2, and toxic metal oxide smoke.

Section 11: Toxicological Information

Routes of Exposure: Eyes, Skin, Inhalation, Ingestion

Symptoms of Exposure:
Inhalation: Acute inhalation can cause metal fume fever. This condition may arise within 4-12 hours after exposure. This is characterized by any of the following symptoms: fever, chills, nausea, weakness, body aches, frontal headache, possible blurred vision, low back pain, muscle cramping, shallow respiration, throat dryness/muscle cramping, dry cough, sweet or metallic taste and chest tightness occurring over several hours. Symptoms usually subside within 24 hours.
Skin Contact: May cause skin sensitization characterized by rashes or hives in predisposed individuals.
Eye Contact: Irritation.
Ingestion: Irritation of mouth, throat and stomach.

Acute Toxicity Effects Data: Not determined for this preparation/mixture.
Component information:

Chemical name	Oral LD_{50} (rat)	Dermal LD_{50} (rabbit)	Inhalation LD_{50} (rat)
Reaction product of phenol-formaldehyde Novolac with epichlorohydrin	>4,000 mg/kg	>2,000 mg/kg Based on similar material	No data available
Trimethylolpropane triglycidyl ether	>2,000 mg/kg	>2,000 mg/kg	No data available
Silver	>2,000 mg/kg	ND	No data available

0% of this product is of unknown acute oral toxicity.

Irritation Effects Data:
Skin irritation: Based on available data, the classification criteria are not met.
Eye irritation: Based on available data, the classification criteria are not met.
Skin sensitization: Classification as sensitizer based on supplier classification of components. Test data not provided.

Chronic toxicity or effects from long term exposures:

Carcinogenicity: No components of this product, present at levels greater than or equal to 0.1%, are identified a Carcinogen per IARC, ACGIH, NTP, or OSHA

Reproductive effects: No data available.

Mutagenicity: No data available

Specific Toxic Organ Toxicity:
Single Exposure: Based on available data, the classification criteria are not met.
Repeated Exposure: Based on available data, the classification criteria are not met.

Section 12: Ecological Information

Not determined for this preparation/mixture. Follow spill and disposal recommendations.
Component information:

Biodegradability: Not determined for this preparation/mixture.
Bioaccumulation: Not determined for this preparation/mixture.
Ecotoxicity effects: Not determined for this preparation/mixture.
Persistence and degradability: Not determined for this preparation/mixture.
Mobility in soil: Not determined for this preparation/mixture.

Ecotoxicity effects

Chemical name	Toxicity to fish	Toxicity to daphnia and

		other aquatic invertebrates.
Reaction product of phenol-formaldehyde Novolac with epichlorohydrin	Acute LC50 5.7 mg/l – (Leuciscus idus) OECD 203, 96 h	Acute EC50 3.5 mg/l – (daphnia magna) OECD 202, 48 hr

Section 13: Disposal Considerations

Waste Disposal: Comply with all current Federal, State, local or Country regulations.

Section 14: Transport Information

DOT Non-Bulk (less than 450L /119 gallons or 400 kgs (882lbs) **Classification:** Not hazardous for transport within US per CFR 49 §171.4 (c)

DOT Bulk Shipments: Classified

Shipping Name: Environmentally Hazardous Substance, liquid, N.O.S. (Silver, Epoxy Resin)
UN/NA Number: UN3082
Shipping Class: 9
Packing Group: III
Shipping Label: Miscellaneous and Environmental Hazard label.

IATA/ IMDG Classification:

Shipping Name: Environmentally Hazardous Substance, liquid, N.O.S. (Silver, Epoxy Resin)
UN/NA Number: UN3082
Shipping Class: 9
Packing Group: III
Shipping Label: Miscellaneous and Environmental Hazard label.

Severe Marine Pollutant or potential Marine Pollutant: Not listed in CFR 49 § 172.101 Appendix B. Meets criteria in UN Model Regulations 2.9.3.

IATA Special Provision A-158: Mixtures of solids which are not subject to these regulations and liquids or solids classified by the shipper as environmentally hazardous substances (UN 3077 or UN 3082) may be transported under this entry, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging is closed. Sealed packets and articles containing less than 10 mL of an environmentally hazardous liquid, absorbed into a solid material but with no free liquid in the packet or article, or containing less than 10 g of an environmentally hazardous solid, are not subject to these regulations.

Excepted Quantity: Maximum quantity per inner packaging 30 g/30mL / Maximum net quantity per outer packaging 1kg/1L (NOTE: Use for UN 3082 or UN-3077)

IATA Special Provision A197—Special provision assigned to environmentally substances, UN 3077 and UN 3082 that allows these substances to be shipped as "not restricted" provided that the net quantity in any receptacle does not exceed 5 kg or 5 L and the packaging used meets defined standards.

Section 15: Regulatory Information

TSCA Status: All components of this product are listed in the EPA Toxic Substance Control Act Inventory. No components are listed under TSCA Section 4 or 5 nor are subject to a TSCA 12 (b) Export Notification.

EPA SARA Title III Chemical Listings

Section 302 Extremely Hazardous Substances: None
Section 304 CERCLA Hazardous Substances: Silver, RQ = 1,000 lb

Section 311/312 Hazard Class(es):
Acute: Yes
Chronic: Yes
Fire: No
Pressure: No
Reactive: No

Section 313 Toxic Chemicals: Silver, metal and compounds (7440-22-4/N740)

Chemical Inventories: All components of this product are listed or in compliance with the following global chemical inventories

Australian Inventory of Chemical Substances (AICS)
Canadian Domestic Substance List (DSL) or Non-Domestic Substance List (NDSL)
China. Inventory of Existing Chemical Substances
European Inventory of Existing Commercial Substances (EINECS), No Longer Polymers list (NLP) —or—
European Chemicals Agency (ECHA) Pre-registered Substance List
Korean Existing Chemicals Inventory (KECL)
Japan. Japan Existing and New Chemical Substances (ENCS) Kashin-Hou Law List
Philippines - Inventory of Chemicals and Chemical Substances (PICCS)

State Right to Know (RTK) lists: Available upon request

Canada Workplace Hazardous Information System (WHMIS) Classification: D2B

Section 16: Additional Information

SDS preparation: Engineered Materials System, Inc.
Preparer: Safety and Compliance Manager
Contact # 1-740-362-4444
Email: kclark@emsadhesives,com

Version Number:	Revision Date	Revisions:
0	October 2005	Original issue
1	August 4, 2015	Updated to GHS format

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