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SAFETY DATA SHEET

EMERGENCY PHONE: 1-800-424-9300

1) PRODUCT IDENTIFICATION

Product: EG8050 (Part A) **Product Type:** Epoxy Paste Adhesive

Product Description: Silver filled two component epoxy system--Part A.

Recommendation On Use: Stress free, high conductive epoxy paste adhesive.

General Use: Die Attach and Substrate Attach

Restriction On Use: For use in combination with Part B.

2) HAZARD IDENTIFICATION

WHMIS Classification: D2B Toxic material causing other effects. Slight skin irritant.

GHS Classification: Skin irritation (Category 2)

Signal Word: Warning

GHS Label elements: H315 Skin irritation.

Precautionary Statement: For industrial use only

Physical Appearance: Paste

Immediate Concerns: This product may cause a rash on the skin.

Primary Route Entry: Skin

Medical Conditions Aggravated: Skin contact may aggravate an existing dermatitus (skiin condition).

Potential Health Effects:

Eyes: Irritant

Skin: Adverse symptoms may include irritation and redness

Ingestion: Aspiration hazard if swallowed

Inhalation: Can cause irritation in throat and lungs

Signs and Symptoms of Overexposure:

Eyes: Adverse symptoms may include irritation, watering and redness

Skin: Skin sensitization may be evidenced by rashes, especially hives

Ingestion: May cause low order of acute toxicity

Inhalation: May cause breathing to become difficult

Acute Toxicity: May cause breathing difficulty

Chronic Exposure: Seek medical attention if any symptoms occur.

Carcinogenicity: Not classifiable as a carcinogen

Mutagenicity: This product has been proven to be inactive when tested by in vivo mutagenicity assays

Reproductive Effects: Not known to cause any reproductive effects

Teratogenic Effects: Not Determined.

Target Organ Stament: No known significant effects or critical hazards

Sensitization: May cause redness or rash

3) COMPOSITION / INFORMATION ON INGREDIENTS

MATERIAL:	CAS NO	%
Silver	7440-22-4	75-85
Epoxy Admixture	25085-99-8	25-15

NOTE: * For powders only; in adhesive product, powders are bound in adhesive and values are not applicable.

4) FIRST AID MEASURES

First Aid Eye: Immediately flush eyes with eyewash solution or clean water holding the eyelids apart for 15 minutes. If symptoms develop, seek medical attention.

First Aid Skin: Flush skin with water followed by washing with soap and water. If irritation occurs, get medical attention.

First Aid Inhale: Move vivtim to fresh air and provide oxygen if breathing is difficult.Seek medical attention.

First Aid Ingest: Do not induce vomiting. No treatment is necessary unless large quantities of product are ingested. However, get medical advice.

Physician Note: No specific treatment. Treat symptomatically.

Acute Symptoms: Seek medical treatment

Delayed Symptoms: Seek medical treatment

5) FIRE FIGHTING MEASURES

Flammable Class: 1

Flame Propagation or Burning Rate of Solids: Not Determined.

General Hazard: Toxic fumes will be evolved when this material is involved in a fire.

Extinguish Media: Use water fog, foam, dry chemical or CO2.

Hazardous Combustion Products: Carbon monoxide, oxides of nitogen, formaldehyde, cyanide

Fire Fighting Procedures: Use self-contained breathing apparatus; decomposition and combustion products may be toxic.

Unsuitable Firefighting Equipment: Not determined

Suitable Firefighting Equipment: Self-contained breathing apparatus should be available for fire fighters.

Sensitive to Static Discharge no **Sensitive to Impact:** No

6) ACCIDENTAL RELEASE MEASURES

Small Spill: Cover with sand and place in waste containers for disposal

Large Spill: Contain spill and place in waste containers for proper disposal

Water Spill: Keep from going into water systems

Land Spill: Contain spill and place in waste containers for proper disposal

General Procedures:

Use the necessary tools and protective equipment

Release Notes:

Unknown

7) HANDLING AND STORAGE

Handling:

Use latex gloves and safety glasses

Storage:

25C

8) EXPOSURE CONTROLS / PERSONAL PROTECTION

PPE Eye and Face: Use protective glasses or goggles.

PPE Skin: Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distilliates required. Whwn handling large quantities, impervious suits, gloves and rubber boots must be worn.

Engineering Controls:	OSHA PEL	ACGIH TLV	EINECS
PPE Respiratory: Not normally required	0.01mg/m³ *	0.1mg/m³ *	
PPE Ventilation: Use well ventilated hood when heating materials	None Established	None Established	

PPE Other: Personal protective equipment should be worn based on the task being performed

Work Hygienic Practices: Use well ventilated hood when heating materials

9) PHYSICAL AND CHEMICAL PROPERTIES

Flashpoint and Method: 480mDEG F (PMCC)

Upper Flammable Limits: Not Determined

Autoignition Temperature: Not Determined

Color: Silver

Vapor Pressure: .03mm hg at 77 DEG C

Vapor Density: N/A (Air=1)

Boiling Point: Not Determined

Melting Point: Not available (DEG F)

Evaporation Rate: Not Determined.

Specific Gravity: 1.17 H20=1

Molecular Weight: 500 to 1500 g/mole

Appearance: Very light yellow, very viscous liquid

Lower Flammable Limits: Not Determined

Physical State: Paste

Odor: Slight chemical odor

Odor Threshold: Not Determined

pH: 7

Freezing Point: 0C

Solubility in Water: <2%

Density: 4.0 g/cc

Viscosity: 800,000 cp

Coeff. Oil/Water: Not Determined.

10) STABILITY AND REACTIVITY

Hazardous Polymerization: May occur.

Chemical Stability: Stable under normal handling and storage condition

Polymerization: No

Conditions to Avoid: Can react vigorously with strong oxidizing agents and mineral acids

Hazardous Decomposition Products:

Thermal degradation could produce carbon monoxide, carbon dioxide and unindentified organic compounds.

Incompatibility Materials:

Acid base chemicals

11) TOXICOLOGICAL INFORMATION

Acute:

Eyes: Stable **Dermal LD50:** > 20 ml/kg (Rabbit) **Oral LD50:** 11.4 g/kg (Rat), 15.6 g/kg (Mouse) **Inhalation LC50:** No deaths in sat'd air, 8 hr

Eye Effects: May cause burning and watery eyes

Skin Effects: Not tested

Carcinogenicity:

IARC: None **NTP:** None **OSHA:** Consistent with (29 CFR 1910 . 1200).

Sensitization: May cause sensitization by skin contact

Reproductive Effects: No know significant effects to critical hazards

TARGET ORGANS:

Eyes: Slight Irritant **Skin:** Moderate irritant, may cause rash. **Gastrointestinal:** Not Determined **Respiratory System:** Not Determined

Teratogenic Effects: May cause sensitization by skin contact

Mutagenicity: Not Determined

12) ECOLOGICAL INFORMATION

Ecotoxicity: No known significant effects or critical hazards

Mobility in Soil: Not Determined

Persistence and Degradability: Advoid runoff into storm sewers and ditches that lead to waterways. Water runoff can cause environmental damage.

Bioaccumulative Potential: Not Determined

13) DISPOSAL CONSIDERATIONS

Disposal Method: Dry at 150C and dispose of according to rules and regulations

For Large Spills: Contain spill and use proper container and protective equipment to clean up spill

Product Disposal: Dispose in accordance with federal, state and local regulations.

Empty Container: Disposal of empty container should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements

14) TRANSPORT INFORMATION

Road and Rail (ADR/RID)

Transport Information: Not Regulated

Kemler Number: Unknown

Hazard Class: Not Hazardous by D.O.T. Regulations

Air (CIAO/IATA)

Shipping Name: Not Regulated

Technical Name: Unknown

UN Number: N/A

Primary Hazard Class: N/A

Packing Group: Unknown

Label: N/A

Vessel (IMO/IMDG)

Shipping Name: Not Regulated

Technical Name: Unknown

UN Shipping Name: N/A

Primary Hazard Class: N/A

Packing Group: Unknown

Label: N/A.

15) REGULATORY INFORMATION

TCSA: This product, or its components, are liste on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Skin: Not determined

Gastrointestinal: Not Determined

Respiratory System: Not Determined

16) OTHER INFORMATION

HMIS Health Rating (1-4): 2

HMIS Flammability Rating (1-4): 1

HMIS Physical Hazard Rating (1-4): 0

Long Term Health Effects (Y/N): N

Note: All ingredients in this product are on the Toxic Substances Control Act (TSCA) inventory or are not required to be listed and are compliant with EC regulation 1907-2006 Art. 31 Annex II.

No ingredient in this product is known to be carcinogenic.

Ingredients listed on the New Jersey "RIGHT TO KNOW" substance list: Silver CAS#7440-22-4 Substance#1669

This product is compliant to RoHS & REACH and does not contain any Substances of Very High Concern

Section X: HMIS Rating: Health-2, Flammability-1, Reactivity-0, Protective Equipment-D

Version: C 2/1/2021

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1) PRODUCT IDENTIFICATION

Product: EG8050 (Part B) **Product Type:** Epoxy Paste Adhesive

Product Description: Silver filled two component epoxy system--Part B.

Recommendation On Use: Stress free, high conductive epoxy paste adhesive.

General Use: Die Attach and Substrate Attach

Restriction On Use: For use in combination with Part A.

2) HAZARD IDENTIFICATION

WHMIS Classification: D2B Toxic material causing other effects. Slight skin irritant.

GHS Classification: Skin irritation (Category 2)

Signal Word: Warning

GHS Label elements: H315 Skin irritation. P280 Wear protective gloves, eye and face protection.

Precautionary Statement: For industrial use only

Physical Appearance: Paste

Immediate Concerns: This product may cause a rash on the skin.

Primary Route Entry: Skin

Medical Conditions Aggravated: Skin contact may aggravate an existing dermatitus (skiin condition).

Potential Health Effects:

Eyes: Irritant

Skin: Adverse symptoms may include irritation and redness

Ingestion: Aspiration hazard if swallowed

Inhalation: Can cause irritation in throat and lungs

Signs and Symptoms of Overexposure:

Eyes: Adverse symptoms may include irritation, watering and redness

Skin: Skin sensitization may be evidenced by rashes, especially hives

Ingestion: May cause low order of acute toxicity

Inhalation: May cause breathing to become difficult

Acute Toxicity: May cause breathing difficulty

Chronic Exposure: Seek medical attention if any symptoms occur.

Carcinogenicity: Not classifiable as a carcinogen

Mutagenicity: This product has been proven to be inactive when tested by in vivo mutagenicity assays

Reproductive Effects: Not known to cause any reproductive effects

Teratogenic Effects: Not Determined.

Target Organ Stament: No known significant effects or critical hazards

Sensitization:

3) COMPOSITION / INFORMATION ON INGREDIENTS

MATERIAL:	CAS NO	%
Silver	7440-22-4	75-85
Epoxy Admixture	25085-99-8	25-15

NOTE: * For powders only; in adhesive product, powders are bound in adhesive and values are not applicable.

4) FIRST AID MEASURES

First Aid Eye: Immediately flush eyes with eyewash solution or clean water holding the eyelids apart for 15 minutes. If symptoms develop, seek medical attention.

First Aid Skin: Flush skin with water followed by washing with soap and water. If irritation occurs, get medical attention.

First Aid Inhale: Move vivtim to fresh air and provide oxygen if breathing is difficult.Seek medical attention.

First Aid Ingest: Do not induce vomiting. No treatment is necessary unless large quantities of product are ingested. However, get medical advice.

Physician Note:

Acute Symptoms: Seek medical treatment

Delayed Symptoms: Seek medical treatment

5) FIRE FIGHTING MEASURES

Flammable Class: 1

Flame Propagation or Burning Rate of Solids: Not Determined.

General Hazard: Toxic fumes will be evolved when this material is involved in a fire.

Extinguish Media: Use water fog, foam, dry chemical or CO2.

Hazardous Combustion Products: Carbon monoxide, oxides of nitogen, formaldehyde, cyanide

Fire Fighting Procedures: Use self-contained breathing apparatus; decomposition and combustion products may be toxic.

Unsuitable Firefighting Equipment: Not determined

Suitable Firefighting Equipment: Self-contained breathing apparatus should be available for fire fighters.

Sensitive to Static Discharge no **Sensitive to Impact:** no

6) ACCIDENTAL RELEASE MEASURES

Small Spill: Cover with sand and place in waste containers for disposal

Large Spill: Contain spill and place in waste containers for proper disposal

Water Spill: Keep from going into water systems

Land Spill: Contain spill and place in waste containers for proper disposal

General Procedures:
Use the necessary tools and protective equipment

Release Notes:
Unknown

7) HANDLING AND STORAGE

Handling:
Use latex gloves and safety glasses

Storage:
25C

8) EXPOSURE CONTROLS / PERSONAL PROTECTION

PPE Eye and Face: Use protective glasses or goggles.

PPE Skin: Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distilliates required. Whwn handling large quantities, impervious suits, gloves and rubber boots must be worn.

	OSHA PEL	ACGIH TLV	EINECS
Engineering Controls:			
PPE Respiratory: Not normally required	0.01mg/m³ *	0.1mg/m³ *	
PPE Ventilation: Use well ventilated hood when heating materials	None Established	None Established	
PPE Other: Personal protective equipment should be worn based on the task being performed			

Work Hygienic Practices: Use well ventilated hood when heating materials

9) PHYSICAL AND CHEMICAL PROPERTIES

Flashpoint and Method: 480mDEG F (PMCC)

Lower Flammable Limits: Not Determined

Upper Flammable Limits: Not Determined

Physical State: Paste

Autoignition Temperature: Not Determined

Odor: Slight chemical odor

Color: Silver

Odor Threshold: Not Determined

Vapor Pressure: .03mm hg at 77 DEG C

pH: 7

Vapor Density: N/A (Air=1)

Boiling Point: Not Determined

Freezing Point: 0C

Melting Point: Not available (DEG F)

Solubility in Water: <2%

Evaporation Rate: Not Determined.

Density: 4.0

Specific Gravity: 1.17 H20=1

Viscosity: 800,000 cp

Molecular Weight: 500 to 1500 g/mole

Coeff. Oil/Water: Not Determined.

Appearance: Very light yellow, very viscous liquid

10) STABILITY AND REACTIVITY

Hazardous Polymerization: May occur.

Chemical Stability: Stable under normal handling and storage condition

Polymerization: No

Conditions to Avoid: Can react vigorously with strong oxidizing agents and mineral acids

Hazardous Decomposition Products:
Thermal degradation could produce carbon monoxide, carbon dioxide and unindentified organic compounds.

Incompatibility Materials:
Acid base chemicals

11) TOXICOLOGICAL INFORMATION

Acute:

Eyes:

Dermal LD50: > 20 ml/kg (Rabbit)

Oral LD50: 11.4 g/kg (Rat), 15.6 g/kg (Mouse)

Inhalation LC50: No deaths in sat'd air, 8 hr

Eye Effects: May cause burning and watery eyes

Skin Effects: Not tested

Carcinogenicity:

IARC: None

NTP: None

OSHA: Consistent with (29 CFR 1910 . 1200).

Sensitization: May cause sensitization by skin contact

Reproductive Effects: No know significant effects to critical hazards

TARGET ORGANS:

Eyes: Slight Irritant **Skin:** Moderate irritant, may cause rash. **Gastrointestinal:** Not Determined **Respiratory System:** Not Determined

Teratogenic Effects: May cause sensitization by skin contact

Mutagenicity: Not Determined

12) ECOLOGICAL INFORMATION

Ecotoxicity: No known significant effects or critical hazards

Mobility in Soil: Not Determined

Persistence and Degradability: Advoid runoff into storm sewers and ditches that lead to waterways. Water runoff can cause environmental damage.

Bioaccumulative Potential: Not Determined

13) DISPOSAL CONSIDERATIONS

Disposal Method: Dry at 150C and dispose of according to rules and regulations

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Product Disposal: Dispose in accordance with federal, state and local regulations.

Empty Container: Disposal of empty container should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements

14) TRANSPORT INFORMATION

Road and Rail (ADR/RID)

Transport Information: Not Regulated

Kemler Number: Unknown

Hazard Class: Not Hazardous by D.O.T. Regulations

Air (CIAO/IATA)

Shipping Name: Not Regulated

Technical Name: Unknown

UN Number: N/A

Primary Hazard Class: N/A

Packing Group: Unknown

Label: N/A

Vessel (IMO/IMDG)

Shipping Name: Not Regulated

Technical Name: Unknown

UN Shipping Name: N/A

Primary Hazard Class: N/A

Packing Group: Unknown

Label: N/A.

15) REGULATORY INFORMATION

TCSA: This product, or its components, are liste on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Skin: Not determined

Gastrointestinal: Not Determined

Respiratory System: Not Determined

16) OTHER INFORMATION

HMIS Health Rating (1-4): 2

HMIS Flammability Rating (1-4): 1

HMIS Physical Hazard Rating (1-4): 0

Long Term Health Effects (Y/N): N

Note: All ingredients in this product are on the Toxic Substances Control Act (TSCA) inventory or are not required to be listed and are compliant with EC regulation 1907-2006 Art. 31 Annex II.

No ingredient in this product is known to be carcinogenic.

Ingredients listed on the New Jersey "RIGHT TO KNOW" substance list: Silver CAS#7440-22-4 Substance#1669

This product is compliant to RoHS & REACH and does not contain any Substances of Very High Concern

Section X: HMIS Rating: Health-2, Flammability-1, Reactivity-0, Protective Equipment-D

Version: C- 2/1/2021

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Stress-Free
One or Two Component
Reworkable
Epoxy Paste Adhesive

PRIMA-SOLDER

EG8050

TYPICAL PROPERTIES*

Electrical Resistivity (150 °C/ 60 min)	<4x10 $^{-4}$ ohm-cm
Dielectric Strength (Volts/mil)	N/A
Glass Transition Temp.(°C)	-20 ±10%
Current Carrying Capabilities	35 Amp/mm²
Lap-Shear Strength	>1000 psi >6.9 N/mm²
Device Push-off Strength	>2000 psi >13.8 N/mm²
Cured Density (gm/cc)	4.0 ±10%
Thermal Conductivity	55 Btu-in/hr-ft²-°F ±10% 7.9 W/m-°C ±10%
Linear Thermal Expansion Coeff. (ppm/°C)	120
Maximum Continuous Operation Temp. (°C)	<150
Avg. Viscosity(0.5 rpm, 25°C) (Brookfield DV-1, Spindle CP51)	185,000 cp ±20%

* Properties given are typical values and not intended for use in preparing specifications. The user is advised to evaluate the product in the manner the product is intended to be used in manufacturing and in the final product.

IDEAL FOR:

- Large Area Die
- Substrate/Component
- Reworkability
- Mismatched CTE's
- Solder Replacement

DESCRIPTION:

EG8050 is an electrically conductive, silver filled epoxy which exhibits outstanding flexibility for bonding materials with highly mismatched CTE's (i.e., alumina to aluminum, silicon to copper). Post bake at 100C or 125C for 24 hrs using a vacuum or air flow oven is recommended in order to pass NASA outgassing testing.

It can be readily reworked at 80-150°C and is ideal for applications such as large area die attach and substrate attach because of it's ability to bond materials with highly mismatched CTE.

AVAILABILITY:

EG8050 is available in syringes for automatic needle dispense applications or in jars. Both viscosity and thixotropic index can be modified to your specific needs. EG8050 can be premixed and frozen.

APPLICATION PROCEDURES:

(1) Mix adhesive in 1:1 weight. (Note: In kit form, Viscosity of Part A > Viscosity of Part B)

(2) Dispense adhesive onto clean substrate.

(3) Cure according to one of the recommended cure schedules.

**CURE SCHEDULES:

Temperature	Time
25°C	168 hr
80°C	8 hr
100°C	4 hr
125°C	2 hr
150°C	1 hr

**If material is premixed and frozen, thaw for 30 minutes and cure according to one of the recommended schedules.

**Shelf life is for unmixed components. If premixed: -40°C for 6 months in original sealed package. After mixing, pot life is 4 hours at 25°C.

1 cps= 1cP=1mPa·s; 1 psi= 145 MPa=N/mm²; 1 lb= 0.225 N; 1 inch=25.4 mm; 1 V/mil= 25.4 kV/mm; 1 lb-in= 8.851 N-m

SHELF LIFE:

Storage temperature	Shelf Life
**25°C	1 yr in original sealed package

CAUTION: This product may cause skin irritation. Avoid skin contact. If contact does occur, wash immediately with soap and water. Please refer SDS for more details.