



Revision Number: 003.0

Issue date: 04/05/2012

**1. PRODUCT AND COMPANY IDENTIFICATION**

<b>Product name:</b> 3888 Silver Electrically Cond A	<b>IDH number:</b> 702034
<b>Product type:</b> Conductive Epoxy	<b>Item number:</b> 29840_209616R
	<b>Region:</b> United States
<b>Company address:</b> Henkel Electronic Materials LLC 14000 Jamboree Road Irvine, CA 92606	<b>Contact information:</b> Telephone: 1.888.9.HENKEL (1.888.943.6535) MEDICAL EMERGENCY Phone: Poison Control Center 1-877-671-4608 (toll free) or 1-303-592-1711 TRANSPORT EMERGENCY Phone: CHEMTREC 1-800-424-9300 (toll free) or 1-703-527-3887 Internet: www.henkelna.com

**2. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**

<b>Physical state:</b> Paste	<b>HEALTH:</b> *2
<b>Color:</b> Silver	<b>FLAMMABILITY:</b> 1
<b>Odor:</b> Faint, Epoxy	<b>PHYSICAL HAZARD:</b> 0
	<b>Personal Protection:</b> See MSDS Section 8
<b>WARNING:</b> MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE EYE AND SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED.	

**Relevant routes of exposure:** Skin, Inhalation, Eyes, Ingestion

**Potential Health Effects**

<b>Inhalation:</b>	May cause respiratory tract irritation.
<b>Skin contact:</b>	May cause allergic skin reaction. May cause skin irritation. Prolonged or repeated skin contact may cause irritation, skin sensitization and argyria (a non-toxic, cosmetic blue-gray discoloration of the skin and mucous membranes that is irreversible).
<b>Eye contact:</b>	Moderate eye irritation.
<b>Ingestion:</b>	May be harmful if swallowed.

**Existing conditions aggravated by exposure:** Eye, skin and respiratory disorders. Eczema. Skin allergies.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Hazardous components	CAS NUMBER	%
Silver	7440-22-4	60 - 100
Epoxy resin	Proprietary	10 - 30
2,3-epoxypropyl o-tolyl ether	2210-79-9	1 - 5
Epoxy resin	Proprietary	1 - 5
Epoxy resin	Proprietary	1 - 5

#### 4. FIRST AID MEASURES

<b>Inhalation:</b>	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Skin contact:</b>	Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. If symptoms develop and persist, get medical attention. Wash clothing before reuse.
<b>Eye contact:</b>	Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
<b>Ingestion:</b>	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Keep individual calm. Get medical attention.

#### 5. FIRE FIGHTING MEASURES

<b>Flash point:</b>	> 93 °C (> 199.4 °F) Estimated
<b>Autoignition temperature:</b>	Not available.
<b>Flammable/Explosive limits - lower:</b>	Not available.
<b>Flammable/Explosive limits - upper:</b>	Not available.
<b>Extinguishing media:</b>	Use dry chemical, water spray or carbon dioxide. Alcohol foam.
<b>Special firefighting procedures:</b>	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.
<b>Unusual fire or explosion hazards:</b>	In case of fire, keep containers cool with water spray. Decomposition and combustion products may be toxic.
<b>Hazardous combustion products:</b>	Oxides of carbon. Aldehydes. Acids. Irritating organic vapours.

#### 6. ACCIDENTAL RELEASE MEASURES

<b>Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.</b>	
<b>Environmental precautions:</b>	Do not allow material to contaminate ground water system. Do not allow product to enter sewer or waterways.
<b>Clean-up methods:</b>	Evacuate personnel to safe areas. Wear suitable protective clothing, gloves and eye/face protection. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up spilled material and place in a closed container for disposal. Flush contaminated area with water.

#### 7. HANDLING AND STORAGE

<b>Handling:</b>	Use only with adequate ventilation. Do not taste or swallow. Avoid contact with eyes, skin and clothing. Keep container closed. Wash thoroughly after handling.
<b>Storage:</b>	For safe storage, store at or below 38 °C (100.4 °F) Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

**For information on product shelf life, please review labels on container or check the Technical Data Sheet.**

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Silver	0.1 mg/m <sup>3</sup> TWA Dust and fume.	0.01 mg/m <sup>3</sup> TWA (as Ag)	None	None
Epoxy resin	None	None	None	None
2,3-epoxypropyl o-tolyl ether	None	None	None	None
Epoxy resin	None	None	None	None
Epoxy resin	None	None	None	None

<b>Engineering controls:</b>	Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination.
<b>Respiratory protection:</b>	Use NIOSH approved respirator if there is potential to exceed exposure limit(s).
<b>Eye/face protection:</b>	Safety goggles or safety glasses with side shields. Safety showers and eye wash stations should be available.
<b>Skin protection:</b>	Chemical resistant, impermeable gloves. Butyl rubber gloves. Neoprene gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Paste
<b>Color:</b>	Silver
<b>Odor:</b>	Faint, Epoxy
<b>Odor threshold:</b>	Not available.
<b>pH:</b>	Not available.
<b>Vapor pressure:</b>	Not available.
<b>Boiling point/range:</b>	> 149 °C (> 300.2 °F)
<b>Melting point/ range:</b>	Not available.
<b>Vapor density:</b>	Not available.
<b>Flash point:</b>	> 93 °C (> 199.4 °F) Estimated
<b>Flammable/Explosive limits - lower:</b>	Not available.
<b>Flammable/Explosive limits - upper:</b>	Not available.
<b>Autoignition temperature:</b>	Not available.
<b>Evaporation rate:</b>	Not available.
<b>Solubility in water:</b>	Not available.
<b>Partition coefficient (n-octanol/water):</b>	Not available.
<b>VOC content:</b>	< 1 %; < 10 g/l Estimated

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Hazardous reactions:</b>	None under normal processing.
<b>Hazardous decomposition products:</b>	Aldehydes. Acids. Oxides of carbon. Irritating organic vapours.
<b>Incompatible materials:</b>	Ammonia. Acetylene. Hydrogen peroxide. Oxalic acid. Strong oxidizing agents. Amines. Acids and bases. Mercaptans.
<b>Conditions to avoid:</b>	Avoid temperatures above 38°C (100°F). Store away from incompatible materials.

## 11. TOXICOLOGICAL INFORMATION

<b>Acute dermal product toxicity:</b>	Prolonged or repeated skin contact with silver and its salts may cause a blue-gray discoloration of the skin and mucous membranes that is irreversible (Argyria).
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Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Silver	No	No	No
Epoxy resin	No	No	No
2,3-epoxypropyl o-tolyl ether	No	No	No
Epoxy resin	No	No	No
Epoxy resin	No	No	No

Hazardous components	Health Effects/Target Organs
Silver	Allergen, Eyes, Irritant, Respiratory, Skin
Epoxy resin	Allergen, Irritant
2,3-epoxypropyl o-tolyl ether	Allergen, Blood, Bone Marrow, Immune system, Irritant, Reproductive
Epoxy resin	Irritant, Allergen
Epoxy resin	Irritant, Allergen

## 12. ECOLOGICAL INFORMATION

**Ecological information:** Not available.

## 13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

**Recommended method of disposal:** Follow all local, state, federal and provincial regulations for disposal.

**Hazardous waste number:** This product contains a component or components identified as hazardous under 40 CFR 261.24. D011: Silver (Check TCLP Level).

## 14. TRANSPORT INFORMATION

The shipping classification in this section is the substance classification. The actual shipping classification may be different as exceptions may apply based upon size of package and mode of shipment. Please refer to shipping documents for package specific transportation classification.

### U.S. Department of Transportation Ground (49 CFR)

**Proper shipping name:** Not regulated  
**Hazard class or division:** None  
**Identification number:** None  
**Packing group:** None

### International Air Transportation (ICAO/IATA)

**Proper shipping name:** Not regulated  
**Hazard class or division:** None  
**Identification number:** None  
**Packing group:** None

### Water Transportation (IMO/IMDG)

**Proper shipping name:** Not regulated  
**Hazard class or division:** None  
**Identification number:** None  
**Packing group:** None

## 15. REGULATORY INFORMATION

### United States Regulatory Information

**TSCA 8 (b) Inventory Status:** All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

**TSCA 12(b) Export Notification:** None above reporting de minimus

**CERCLA/SARA Section 302 EHS:** None above reporting de minimus  
**CERCLA/SARA Section 311/312:** Immediate Health, Delayed Health

**CERCLA/SARA 313:** This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Silver (CAS# 7440-22-4).  
**CERCLA Reportable quantity:** Silver (CAS# 7440-22-4) 1,000 lbs. (454 kg)  
**California Proposition 65:** This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

**Canada Regulatory Information**

**CEPA DSL/NDSL Status:** All components are listed on or are exempt from listing on the Canadian Domestic Substances List.  
**WHMIS hazard class:** D.2.A, D.2.B

**16. OTHER INFORMATION**

**This material safety data sheet contains changes from the previous version in sections:** This Material Safety Data Sheet contains changes from the previous version in Section(s): 1,2,10,13,15

**Prepared by:** Nicole Laput, Regulatory Affairs Specialist

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1. PRODUCT AND COMPANY IDENTIFICATION

Product name: 3888 Silver Electrically Cond E
Product type: Conductive Epoxy
Company address: Henkel Electronic Materials LLC
IDH number: 702033
Item number: 29840\_209616H
Region: United States
Contact information: Telephone: 1.888.9.HENKEL (1.888.943.6535)
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical state: Liquid
Color: Tan
Odor: ammoniacal
HEALTH: \*3
FLAMMABILITY: 1
PHYSICAL HAZARD: 0
Personal Protection: See MSDS Section 8
DANGER: CAUSES EYE AND SKIN BURNS.
MAY CAUSE ALLERGIC SKIN REACTION.
CAUSES RESPIRATORY TRACT IRRITATION.
MAY BE HARMFUL IF SWALLOWED, ABSORBED THROUGH SKIN OR
INHALED.

Relevant routes of exposure: Skin, Inhalation, Eyes, Ingestion

Potential Health Effects

Inhalation: Causes respiratory tract irritation. May cause irritation to nose and throat. May be harmful if inhaled.
Skin contact: Causes skin burns. May cause allergic skin reaction. Severe skin irritation. May be harmful if absorbed through skin. Redness. Swelling.
Eye contact: Causes eye burns. Severe eye irritation. Burns of the eye may cause blindness. Stinging. Redness. Swelling. Tearing.
Ingestion: If ingested, severe burns of the mouth and throat may occur, as well as perforation of the esophagus and the stomach. May be harmful if swallowed.

Existing conditions aggravated by exposure: Asthma. Eye, skin, and respiratory disorders. Skin allergies. Kidney disorders. Liver disorders.
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol diamine	Proprietary	30 - 60
Aliphatic amine adduct	Proprietary	10 - 30
Triethylenetetramine	112-24-3	5 - 10
Monoethanolamine	141-43-5	5 - 10
Substituted aminophenol	Proprietary	1 - 5

### 4. FIRST AID MEASURES

<b>Inhalation:</b>	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Skin contact:</b>	Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Get medical attention. Wash clothing before reuse.
<b>Eye contact:</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
<b>Ingestion:</b>	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Keep individual calm. Get medical attention.

### 5. FIRE FIGHTING MEASURES

<b>Flash point:</b>	> 93 °C (> 199.4 °F) ; Estimated
<b>Autoignition temperature:</b>	Not available.
<b>Flammable/Explosive limits - lower:</b>	Not available.
<b>Flammable/Explosive limits - upper:</b>	Not available.
<b>Extinguishing media:</b>	Alcohol foam. Dry chemical. Carbon dioxide.
<b>Special firefighting procedures:</b>	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.
<b>Unusual fire or explosion hazards:</b>	Personnel in vicinity and downwind should be evacuated. Burning produces obnoxious and toxic fumes.
<b>Hazardous combustion products:</b>	Ammonia. Oxides of carbon. Oxides of nitrogen. Nitric acid. Nitrosamines.

### 6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

<b>Environmental precautions:</b>	Do not allow material to contaminate ground water system. Do not allow product to enter sewer or waterways.
<b>Clean-up methods:</b>	Ensure adequate ventilation. Wear suitable protective clothing, gloves and eye/face protection. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up spilled material and place in a closed container for disposal.

## 7. HANDLING AND STORAGE

**Handling:** Do not get in eyes. Do not get on skin or clothing. Do not breathe gas/fumes/vapor/spray. Do not taste or swallow. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

**Storage:** Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use. Do not store near acids. Do not store in reactive metal containers.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol diamine	None	None	None	None
Aliphatic amine adduct	None	None	None	None
Triethylenetetramine	None	None	1 ppm (6 mg/m <sup>3</sup> ) TWA (SKIN)	None
Monoethanolamine	6 ppm STEL 3 ppm TWA	3 ppm (6 mg/m <sup>3</sup> ) TWA	None	None
Substituted aminophenol	None	None	None	None

**Engineering controls:** Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

**Respiratory protection:** Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

**Eye/face protection:** Safety goggles or safety glasses with side shields. Wear chemical goggles or a full face shield.

**Skin protection:** Use chemical resistant, impermeable clothing including gloves and either an apron or body suit to prevent skin contact. Neoprene, Butyl-rubber, or nitrile-rubber gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Liquid

**Color:** Tan

**Odor:** ammoniacal

**Odor threshold:** Not available.

**pH:** Not available.

**Vapor pressure:** Not available.

**Boiling point/range:** Not available.

**Melting point/ range:** Not available.

**Vapor density:** Not available.

**Flash point:** > 93 °C (> 199.4 °F) ; Estimated

**Flammable/Explosive limits - lower:** Not available.

**Flammable/Explosive limits - upper:** Not available.

**Autoignition temperature:** Not available.

**Evaporation rate:** Not available.

**Solubility in water:** Not available.

**Partition coefficient (n-octanol/water):** Not available.

**VOC content:** 1 %; 10 g/l Estimated



## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Hazardous reactions:</b>	Will not occur.
<b>Hazardous decomposition products:</b>	Ammonia. Oxides of carbon. Oxides of nitrogen. Nitric acid. Nitrosamines.
<b>Incompatible materials:</b>	Oxidizing agents. Organic acids. Mineral acids. Nitrous acid and other nitrosating agents. Strong bases. Acrylates. copper Halogenated compounds. Ketones. Organic anhydrides. This product slowly corrodes copper, aluminum, zinc and galvanized surfaces. CAUTION! N-nitrosamines (many of which are known to be potent carcinogens) may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations.
<b>Conditions to avoid:</b>	Store away from incompatible materials. Keep away from open flames, hot surfaces and sources of ignition.

## 11. TOXICOLOGICAL INFORMATION

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol diamine	No	No	No
Aliphatic amine adduct	No	No	No
Triethylenetetramine	No	No	No
Monoethanolamine	No	No	No
Substituted aminophenol	No	No	No

Hazardous components	Health Effects/Target Organs
Polyglycol diamine	Corrosive
Aliphatic amine adduct	No Records
Triethylenetetramine	Allergen, Corrosive, Developmental, Irritant, Mutagen
Monoethanolamine	Irritant, Kidney, Liver, Corrosive, Respiratory, Developmental
Substituted aminophenol	Irritant, Allergen

## 12. ECOLOGICAL INFORMATION

**Ecological information:** Not available.

## 13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

**Recommended method of disposal:** Follow all local, state, federal and provincial regulations for disposal.

**Hazardous waste number:** This product, if discarded, may be characterized as a RCRA corrosive waste, D002.

## 14. TRANSPORT INFORMATION

### U.S. Department of Transportation Ground (49 CFR)

**Proper shipping name:** Amines, liquid, corrosive, n.o.s. (Polyglycol diamine, Triethylenetetramine)  
**Hazard class or division:** 8  
**Identification number:** UN 2735  
**Packing group:** II  
**Exceptions:** (Not more than 1 L), ORM-D, Consumer Commodity

**International Air Transportation (ICAO/IATA)**

**Proper shipping name:** Amines, liquid, corrosive, n.o.s. (Polyglycol diamine, Triethylenetetramine)  
**Hazard class or division:** 8  
**Identification number:** UN 2735  
**Packing group:** II

**Water Transportation (IMO/IMDG)**

**Proper shipping name:** AMINES, LIQUID, CORROSIVE, N.O.S. (Polyglycol diamine, Triethylenetetramine)  
**Hazard class or division:** 8  
**Identification number:** UN 2735  
**Packing group:** II

**15. REGULATORY INFORMATION**

**United States Regulatory Information**

**TSCA 8 (b) Inventory Status:** All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.  
**TSCA 12(b) Export Notification:** None above reporting de minimus  
**CERCLA/SARA Section 302 EHS:** None above reporting de minimus  
**CERCLA/SARA Section 311/312:** Immediate Health, Delayed Health  
**CERCLA/SARA 313:** None above reporting de minimus  
**California Proposition 65:** No California Proposition 65 listed chemicals are known to be present.

**Canada Regulatory Information**

**CEPA DSL/NDL Status:** All components are listed on or are exempt from listing on the Canadian Domestic Substances List.  
**WHMIS hazard class:** D.2.A, D.2.B, E

**16. OTHER INFORMATION**

**This material safety data sheet contains changes from the previous version in sections:** Updated WHMIS., New information added in Section(s): 3,8,11,13,15

**Prepared by:** Nicole Laput, Regulatory Affairs Specialist

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