



Kit Revision Date: 07/10/2024

SUPER SHIELD™ SILVER COATED COPPER EPOXY CONDUCTIVE PAINT KIT

MG Chemicals Multipart Product Kit

This product is a kit made up of multiple parts. Each part is an independently packaged chemical component and has independent hazard assessments.

Kit Content

<i>Part</i>	<i>Product Name</i>	<i>Product Use</i>
A	843ER-A	Electrically conductive epoxy coating resin for use with hardeners
B	843ER-B	Electrically conductive epoxy coating hardener for use with resins

Safety Data Sheets for each part listed above follow this cover sheet.

Transportation Instruction

Before offering this product kit for transport, read Section 14 for all parts listed above.

843ER-A

SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 843ER-A**Other Means of Identification:** Super Shield™ Silver Coated Copper Epoxy Conductive Paint (Part A)**Related Part #** 843ER-250ML, 843ER-800ML, 843ER-3.25L

Recommended Use and Restriction on Use

Use: Electrically conductive epoxy coating resin for use with hardeners**Uses Advised Against:** Not available

Details of Manufacturer or Importer

ManufacturerMG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADAMG Chemicals (Head Office)
9347-193 Street
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E-MAILinfo@mgchemicals.com**E-MAIL** (Competent Person): sds@mgchemicals.com

Emergency Phone Number




For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**
(Service access code: 335388)**For emergencies involving the transport of dangerous goods;** 24/7 service
CANADA—Call CANUTEC collect at **+1-613-996-6666** or ***666** on cellular phones

843ER-A
SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)
Section 2: Hazard(s) Identification
Classification of Hazardous Chemical
GHS Categories

Criteria		Category	Signal Word	Pictograms
Flammable Liquid		2	Danger	Flame
Eye Damage		1	Danger	Corrosion
Sensitization	Skin	1	Warning	Exclamation
Skin Irritation		2	Warning	Exclamation
Specific Target Organ Toxicity	Single Exposure	3	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	1	Warning	Environment


Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

Label Elements

Signal Word	DANGER
Pictograms	Hazard Statements
	H225: Highly flammable liquid and vapour
	H318: Causes serious eye damage
	H315: Causes skin irritation H317: May cause an allergic skin reaction H336: May cause drowsiness or dizziness

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)
Continued...

Pictograms	Hazard Statements
	H410: Very toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof equipment.
P243	Take action to prevent static discharges.
P261	Avoid breathing mist, vapors, and spray.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed of the workplace.
P280	Wear protective gloves and eye protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
Response	Precautionary Statements
P370 + P378	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
P303 + P361 + P364 + P352	IN ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Wash skin with plenty of water.
P333 + P313	If skin irritation or rash occurs: Get medical advice or attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call POISON CENTER or doctor.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
P391	Collect spillage.

Section continued on the next page

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Continued...

Storage	Precautionary Statements
P403 + P233	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents in accordance to local, regional, national, and international regulations.

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Defats skin	Repeated exposure may cause skin dryness or cracking.	None	None
Argyria	Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.	None	None

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
78-93-3	butan-2-one ^{a)}	42%
7440-50-8	copper	22%
25068-38-6	bisphenol-A epoxy resin (reaction product)	19%
71-36-3	1-butanol	5%
67-63-0	propan-2-ol ^{b)}	5%
7440-22-4	silver	3%
14807-96-6	talc	2%

a) Also known as methyl ethyl ketone (MEK)

b) Also known as isopropyl alcohol (IPA)

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF ON SKIN	P303 + P361 + P352, P333 + P313, P363
Immediate Symptoms	<i>redness, irritation, dry skin, allergic contact dermatitis</i>
Response	Take off immediately all contaminated clothing. Wash skin with plenty of water. If skin irritation or rash occurs: Get medical advice or attention. Wash contaminated clothing before reuse.
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	<i>redness, pain, eye damage</i>
Response	Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call POISON CENTER or doctor.
IF INHALED	P304 + P340 + P312
Immediate Symptoms	<i>drowsiness, dizziness, cough, headaches, nausea, unconsciousness</i>
Response	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	<i>nausea, sore throat, diarrhea, drowsiness, dizziness</i>
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish. Use water spray to cool containers.
Specific Hazards	Produces irritating toxic fumes in fires or in contact with hot surfaces. The vapors are heavier than air and may accumulate in low-lying areas. Vapors may travel long distances and ignite at an ignition source, which can cause a flashback or an explosion.
Combustion Products	Produces carbon oxides (CO,CO ₂) and metal oxide fumes.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	See personal protection recommendations in Section 8.
Precautions for Response	Avoid breathing mist, spray, and vapors. Remove or keep away all sources of extreme heat or open flames.
Environmental Precautions	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
Containment Methods	Contain with inert absorbent (such as soil, sand, vermiculite).
Cleaning Methods	Collect liquid in a sealable, solvent-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wash spill area with soap and water to remove the last traces of residue.
Disposal Methods	Dispose of spill waste according to Section 13.

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Section 7: Handling and Storage**Prevention**

Keep out of reach of children.

Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No Smoking.

Keep container tightly closed.

Ground and bond container and receiving equipment. Use explosion-proof equipment. Take action to prevent static discharges.

Avoid breathing mist, vapors, and spray. Use only outdoors or in a well-ventilated area.

Contaminated work clothing should not be allowed out of the workplace.

Avoid release to the environment.

Handling

Wear protective gloves and eye protection.

Take off contaminated clothing and wash it before reuse.

Wash hands thoroughly after handling.

Collect spillage.

Storage

Store in a well-ventilated place. Keep cool.

Store locked up.

Section 8: Exposure Controls/Personal Protection**Substances with Occupational Exposure Limit Values**

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
butan-2-one	ACGIH	200 ppm	300 ppm
	U.S.A. OSHA PEL	200 ppm	Not established
	Canada AB	200 ppm	300 ppm
	Canada BC	50 ppm	100 ppm
	Canada ON	200 ppm	300 ppm
	Canada QC	50 ppm	100 ppm
copper (dust and mist)	ACGIH	1 mg/m ³	Not established
	U.S.A. OSHA PEL	1 mg/m ³	Not established
	Canada AB	1 mg/m ³	Not established
	Canada BC	1 mg/m ³	Not established
	Canada ON	1 mg/m ³	Not established
	Canada QC	1 mg/m ³	Not established

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)
Continued...

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1-butanol	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	20 ppm 100 ppm 20 ppm 15 ppm 20 ppm 50 ppm (Ceiling)	Not established Not established Not established 30 ppm (Ceiling) Not established Not established
propan-2-ol	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	200 ppm 400 ppm 200 ppm 200 ppm 200 ppm 400 ppm	400 ppm Not established 400 ppm 400 ppm 400 ppm 500 ppm
silver (metal dust, mist) (metal) (Ag and its compounds) (metal, dust, fumes)	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	0.1 mg/m ³ 0.01 mg/m ³ 0.1 mg/m ³ 0.01 mg/m ³ 0.1 mg/m ³ 0.1 mg/m ³	Not established Not established Not established 0.03 mg/m ³ Not established Not established
talc (without asbestos fibers)	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	2 mg/m ³ 20 mppcf ^{a)} 2 mg/m ³ 2 mg/m ³ 2 mg/m ³ 3 mg/m ³	Not established Not established Not established Not established Not established Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH¹, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS database² and from suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) Millions of particles per cubic foot air, based on impinge samples counted by light-field technique.

Engineering Controls
Ventilation

Keep airborne concentrations below the occupational exposure limits (OEL).

Section continued on the next page

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****Personal Protective Equipment****Eye protection**

Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Ensure that glasses have side shields for lateral protection.

Skin Protection

For likely contacts, use of protective butyl rubber, fluorinated rubber, or other chemically resistant gloves.

For incidental contacts, use nitrile, neoprene, PVC gloves, or other chemically resistant gloves.

Respiratory Protection

For over-exposures up to 10 x OEL of mist/vapors/spray, wear respirator such as a half-mask respirator with organic vapor cartridges.

Above 10 x OEL, use a positive-pressure, air-supplied respirator or a self-contained breathing apparatus.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator has filter cartridges appropriate for the ingredients listed in section 3 of this SDS, and that the respirator is fitted to the employee by a professional.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Section 9: Physical and Chemical Properties

Physical State	Liquid	Lower Flammability Limit ^{b)}	1.8%
Appearance	Light brown metallic	Upper Flammability Limit ^{b)}	10%
Odor	Acetone-like	Vapor Pressure @20 °C	53 hPa [40 mmHg]
Odor Threshold	Not available	Vapor Density ^{c)}	≥2.1 (Air =1)
pH	Not available	Relative Density @25 °C	1.19
Freezing/Melting Point	Not available	Solubility in Water	Partially soluble
Initial Boiling Point ^{a)}	≥80 °C [≥176 °F]	Partition Coefficient n-octanol/water	Not available
Flash Point ^{a)}	≥-3 °C [≥26.6 °F]	Auto-ignition Temperature ^{d)}	≥343 °C [≥649 °F]
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability	Flammable	Viscosity @25 °C	30 mm ² /s

a) Values based on butan-2-one component.

b) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle and component LFL and UFL limits

c) Values based on propanol-2-ol component.

d) Values based on 1-butanol component.

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)

Section 10: Stability and Reactivity

Reactivity	Not available
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Ignition sources, excessive heat, and incompatible substances
Incompatibilities	Oxidizing agents, strong acids, and strong bases
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

Section 11: Toxicological Information

Summary of Effects and Symptoms by Routes of Exposure

Eyes	Causes redness, pain and eye damage.
Skin	Causes redness, irritation, dry skin, or allergic contact dermatitis.
Inhalation	May cause drowsiness, dizziness, cough, headaches, nausea, and unconsciousness.
Ingestion	May cause nausea, sore throat, and diarrhea (see inhalation symptoms.)
Chronic	Prolonged or repeated exposure may cause skin dryness, cracking, as well as defatting the skin. Exposure to silver powder may also cause argyria, an irreversible blue-grey discoloration of the skin.

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
butan-2-one	2 737 mg/kg Rat	6 480 mg/kg Rabbit	23 500 mg/m ³ 8 h Rat
copper	>5 000 mg/kg Mouse	Not available	Not available
bisphenol-A epoxy resin (reaction product)	>2 000 mg/kg Rat	>2 000 mg/kg Rat	Not available

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)
Continued...

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
1-butanol	790 mg/kg Rat	3 400 mg/kg Rabbit	>24 000 mg/m ³ Rat
propan-2-ol	3 600 mg/kg Rat	12 800 mg/kg Rabbit	16 000 ppm 8 h Rat
silver	>5 g/kg Guinea Pig	≥2 000 mg/kg Rabbit	5.16 mg/L 4 h (dust) Rat
talc	Not available	Not available	Not available

Note: Toxicity data from the RTECS² and ECHA databases were consulted. Data from supplier SDS were also consulted.

Other Toxicological Effects
Skin corrosion/irritation

Bisphenol-A and 1-butanol are known skin irritants.

**Serious eye
damage/irritation**

Butan-2-one, bisphenol-A, 1-butanol, and propan-2-ol are known serious eye irritants.

Sensitization
(allergic reactions)

The epoxy resin component (CAS# 25068-38-6) may cause skin sensitization in humans.

Carcinogenicity
(risk of cancer)

Based on available data, the classification criteria are not met.

Mutagenicity
(risk of heritable genetic effects)

Based on available data, the classification criteria are not met.

Reproductive Toxicity
(risk to sex functions)

Based on available data, the classification criteria are not met.

Teratogenicity
(risk of fetus malformation)

Based on available data, the classification criteria are not met.

STOT-single exposure

Butan-2-one, 1-butanol, and propan-2-ol can affect the central nervous system by inhalation causing drowsiness or dizziness.

STOT-repeated exposure

Based on available data, the classification criteria are not met.

Section continued on the next page

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****Aspiration hazard**

Based on available data, the classification criteria are not met. There is less than 10% category 1 components.

Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (<http://echa.europa.eu>), and other reliable sources.

Contains silver and copper particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver and ionic copper levels that are very toxic to the environment. While massive silver and copper are insoluble in water, their powders are considered sufficiently soluble to give rise to an ecological hazard by EU regulators. The classification that follows takes into account to chronic aqueous toxicity of category 1 (M = 10 for silver and M = 1 for copper) of the EU.

The epoxy resin (CAS# 25068-38-6) have a LC50 for aquatic organisms 1 mg/L to 10 mg/L.

Butan-1-ol is not classifiable as an environmental toxicant with minimal LC50 96 h of 1 840 mg/L for Pimephales promelas (fathead minnow); and LC40 48 h of 44 mg/L, EC50 72 h of 648 mg/L Daphnia magna (water flea).

Based on available data, propan-2-ol and butan-2-one (MEK) do not meet the environmental toxicant classification with LC50 and EC50 >100 mg/L.

- Propan-2-ol has a minimal LC50 96 h of 9 640 mg/L for Pimephales promelas (fathead minnow); an EC50 24 h of 5 102 mg/L Daphnia magna (water flea); and an EC50 72 h of 2 000 mg/L Desmodesmus subspicatus (green algae).
- Butan-2-one has a minimal LC50 96 h of 400 mg/L for Pimephales promelas (fathead minnow); LC50 48 h of >520 mg/L and EC50 48 h of 13 500 mg/L for Daphnia magna (water flea).

Acute Ecotoxicity

See chronic ecotoxicity

Chronic Ecotoxicity

Category 1

Very toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage.

Section continued on the next page

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****Biodegradability**

Not readily biodegradable

Other Effects

Actual VOC (Volatile Organic Compounds) content according to the US (EPA) and Canadian (CEPA) authorities.

VOC = 52% [627 g/L]

Section 13: Disposal Information

Dispose of contents in accordance with all local, regional, national, and international regulations.

Section 14: Transport Information**Ground**

Refer to TDG regulations (Canadian Transportation of Dangerous Goods regulations);
USA CFR 49 Regulations (Parts 100 to 185).

Sizes 5 L and under

*Part A of 843ER-250ML, 843ER-800ML,
843ER-3.25L kits*

Limited Quantity



Section continued on the next page

843ER-A
SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)
Air
Refer to ICAO-IATA Dangerous Goods Regulations.
Sizes 1 L and under
Part A of 843ER-250ML, 843ER-800ML
Limited Quantity

Sizes greater than 1 L up to 5 L
Part A of 843ER-3.25L kit
UN number: UN1139

Shipping Name: COATING SOLUTION

Class: 3

Packing Group: II

Marine Pollutant: Yes

Sea
Refer to IMDG regulations.
Sizes 5 L and under
Part A of 843ER-250ML, 843ER-800ML, 843ER-3.25L kits
Limited Quantity

Sizes greater than 5 L
FOR REFERENCE ONLY
UN number: UN1139

Shipping Name: COATING SOLUTION

Class: 3

Packing Group: II

Marine Pollutant: Yes


Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****Section 15: Regulatory Information****Canada****Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)**

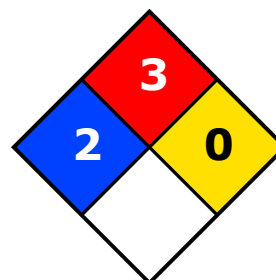
All hazardous ingredients are listed on the DSL.

Hazardous Products Act (R.S.C., 1985, c. H-3)

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

USA**Other Classifications****HMIS[®] RATING**

HEALTH:	*	2
FLAMMABILITY:		3
PHYSICAL HAZARD:		0
PERSONAL PROTECTION:		

NFPA[®] 704 CODES

Approximate HMIS and NFPA Risk Ratings Legend:

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product contains silver (CAS# 7440-22-4; reportable quantity = 1 000 lb), copper (CAS# 7440-50-8; reportable quantity = 5 000 lb), n-butanol (CAS# 67-63-0; reportable quantity = 5 000 lb), and propan-2-ol (CAS# 67-63-0), which are subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

This product contains butan-2-one (CAS# 78-93-3, reportable quantity = 5 000 lb), which can be subject to the CERCLA reporting requirements.

Section continued on the next page

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****TSCA** (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, USA).

This product does not contain any substances known to be listed in California.

Europe**RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

WEEE (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

Section 16: Other Information

SDS Prepared by MG Chemicals' Regulatory Department

Date of Review 14 April 2020

Supersedes 03 March 2020

Reason for Changes: Update to the product name.

Reference

1) ACGIH 2017 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2017).

2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

843ER-A**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART A)****Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
ECHA	European Chemicals Agency
EU	European Union
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
IARC	International Agency for Research on Cancer
NOELR	No observable effect loading ratio
NTP	National Toxicology Program
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
SDS	Safety Data Sheet
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

Technical Queries Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

Email: support@mgchemicals.com

Mailing Addresses *Manufacturing & Support*
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L7L 5R6

Head Office
9347-193rd Street
Surrey, British Columbia, Canada
V4N 4E7

Disclaimer This safety data sheet is provided as an information resource only. *M.G. Chemicals, Ltd.* believes the information contained herein is accurate and compiled from reliable sources. It is the responsibility of the user to query and verify any information seeming suspect where doubt on the validity may exist. The buyer assumes all responsibility of using and handling the product in accordance with local, regional, national, and international regulations.

843ER-B

SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 843ER-B**Other Means of Identification:** Super Shield™ Silver Coated Copper Epoxy Conductive Paint (Part B)**Related Part #** 843ER-250ML, 843ER-800ML, 843ER-3.25L

Recommended Use and Restriction on Use

Use: Electrically conductive epoxy coating hardener for use with resins**Uses Advised Against:** Not available

Details of Manufacturer or Importer

ManufacturerMG Chemicals
1210 Corporate Drive
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Emergency Phone Number




For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**
(Service access code: 335388)**For emergencies involving the transport of dangerous goods;** 24/7 service
CANADA—Call CANUTEC collect at **+1-613-996-6666** or ***666** on cellular phones

843ER-B
SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)
Section 2: Hazard(s) Identification
Classification of Hazardous Chemical
GHS Categories

Criteria		Category	Signal Word	Pictograms
Eye Damage		1	Danger	Corrosion
Flammable Liquid		2	Danger	Flame
Sensitization	Skin	1	Warning	Exclamation
Skin Irritation		2	Warning	Exclamation
Specific Target Organ Toxicity	Single Exposure	3	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	2	none	Environment


Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

Label Elements

Signal Word	DANGER
Pictograms	Hazard Statements
	H225: Highly flammable liquid and vapour
	H318: Causes serious eye damage
	H315: Causes skin irritation H317: May cause an allergic skin reaction H336: May cause drowsiness or dizziness

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)***Continued...*

Pictograms	Hazard Statements
	H411: Toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof equipment.
P243	Take action to prevent static discharges.
P261	Avoid breathing mist, vapors, and spray.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed of the workplace.
P280	Wear protective gloves, eye protection, and face protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
Response	Precautionary Statements
P370 + P378	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
P303 + P361 + P364 + P352	IN ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Wash skin with plenty of water.
P333 + P313	If skin irritation or rash occurs: Get medical advice or attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call POISON CENTER or doctor.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
P391	Collect spillage.

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)***Continued...*

Storage	Precautionary Statements
P403 + P233	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents in accordance to local, regional, national international regulations.

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Defats skin	Repeated exposure may cause skin dryness or cracking.	None	None

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
78-93-3	butan-2-one ^{a)}	55%
68410-23-1	fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines ^{b)}	34%
67-63-0	propan-2-ol ^{c)}	5%
71-36-3	1-butanol	4%
112-24-3	triethylenetetramine	1%

a) Also known as methyl ethyl ketone (MEK)

b) Also known generically as a polyamide polymer

c) Also known as isopropyl alcohol (IPA)

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF ON SKIN	P303 + P361 + P352, P333 + P313, P363
Immediate Symptoms	<i>redness, irritation, dry skin, allergic contact dermatitis</i>
Response	Take off immediately all contaminated clothing. Wash skin with plenty of water. If skin irritation or rash occurs: Get medical advice or attention. Wash contaminated clothing before reuse.
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	<i>redness, pain, eye damage</i>
Response	Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call POISON CENTER or doctor.
IF INHALED	P304 + P340 + P312
Immediate Symptoms	<i>drowsiness, dizziness, cough, headaches, nausea, unconsciousness</i>
Response	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	<i>nausea, sore throat, diarrhea, drowsiness, dizziness</i>
Response	Rinse mouth. Do NOT induce vomiting.

Advice to Physicians

In case of exposure to nitrogen oxides (NOx) combustion products or triethylenetetramine vapors during a fire, the symptoms may be delayed. For significant exposures, the exposed person should be kept under medical surveillance for 48 hours.

Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish. Use water spray to cool containers.
Specific Hazards	The vapors are heavier than air and may accumulate in low-lying areas. Vapors may travel long distances and ignite at an ignition source, which can cause a flashback or an explosion.
Combustion Products	Produces carbon oxides (CO,CO ₂) and nitrogen oxides (NO _x).
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	See personal protection recommendations in Section 8.
Precautions for Response	Avoid breathing the mist, spray, and vapors. Remove or keep away all sources of extreme heat or open flames.
Environmental Precautions	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
Containment Methods	Contain with inert absorbent (such as soil, sand, vermiculite).
Cleaning Methods	Collect liquid in a sealable, solvent-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wash spill area with soap and water to remove the last traces of residue.
Disposal Methods	Dispose of spill waste according to Section 13.

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****Section 7: Handling and Storage****Prevention**

Keep out of reach of children.

Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No Smoking.

Keep container tightly closed.

Ground and bond container and receiving equipment. Use explosion-proof equipment. Take action to prevent static discharges.

Avoid breathing mist, vapors, and spray. Use only outdoors or in a well-ventilated area.

Contaminated work clothing should not be allowed out of the workplace.

Avoid release to the environment.

Handling

Wear protective gloves, eye protection, and face protection.

Take off contaminated clothing and wash it before reuse.

Wash hands thoroughly after handling.

Collect spillage.

Storage

Store in a well-ventilated place. Keep cool.

Store locked up.

Section 8: Exposure Controls/Personal Protection**Substances with Occupational Exposure Limit Values**

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
butan-2-one	ACGIH	200 ppm	300 ppm
	U.S.A. OSHA PEL	200 ppm	Not established
	Canada AB	200 ppm	300 ppm
	Canada BC	50 ppm	100 ppm
	Canada ON	200 ppm	300 ppm
	Canada QC	50 ppm	100 ppm
propan-2-ol	ACGIH	200 ppm	400 ppm
	U.S.A. OSHA PEL	400 ppm	Not established
	Canada AB	200 ppm	400 ppm
	Canada BC	200 ppm	400 ppm
	Canada ON	200 ppm	400 ppm
	Canada QC	400 ppm	500 ppm

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)
Continued...

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1-butanol	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	20 ppm 100 ppm 20 ppm 15 ppm 20 ppm 50 ppm (Ceiling)	Not established Not established Not established 30 ppm (Ceiling) Not established Not established
triethylenetetramine	ACGIH U.S.A. OSHA PEL U.S.A (WEEL) Canada AB Canada BC Canada ON Canada QC	Not established Not established 1 ppm Not established Not established 0.5 mg/m ³ (Skin) ^{a)} Not established	Not established Not established Not established Not established Not established Not established Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH¹, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database² and data from suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) Skin—can be absorbed through the skin.

Engineering Controls
Ventilation

Keep airborne concentrations below the occupational exposure limits (OEL).

Personal Protective Equipment
Eye protection

Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Ensure that glasses have side shields for lateral protection.

Skin Protection

For likely contacts, use of protective butyl rubber, fluorinated rubber, or other chemically resistant gloves.

For incidental contacts, use nitrile, neoprene, PVC gloves, or other chemically resistant gloves.

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)

Respiratory Protection For over-exposures up to 10 x OEL of mist/vapors/spray, wear respirator such as a half-mask respirator with organic vapor cartridges.

Above 10 x OEL, use a positive-pressure, air-supplied respirator or a self-contained breathing apparatus.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator has filter cartridges appropriate for the ingredients listed in section 3 of this SDS, and that the respirator is fitted to the employee by a professional.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquid	Lower Flammability Limit ^{b)}	1.8%
Appearance	Clear, amber	Upper Flammability Limit ^{b)}	10%
Odor	Ammonia-like	Vapor Pressure @20 °C	82 hPa [62 mmHg]
Odor Threshold	Not available	Vapor Density ^{c)}	≥2.1 (Air =1)
pH	Not available	Relative Density @25 °C	0.87
Freezing/Melting Point	Not available	Solubility in Water	Partially soluble
Initial Boiling Point ^{a)}	≥80 °C [≥176 °F]	Partition Coefficient n-octanol/water	Not available
Flash Point ^{a)}	≥-3 °C [≥26.6 °F]	Auto-ignition Temperature ^{d)}	≥343 °C [≥649 °F]
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability	Not available	Viscosity @25 °C	11 mm ² /s

a) Values based on butan-2-one component.

b) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle and component LFL and UFL limits

c) Values based on propanol-2-ol component.

d) Values based on 1-butanol component.

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****Section 10: Stability and Reactivity**

Reactivity	Not available
Chemical Stability	Chemically stable at normal temperatures and pressures.
Conditions to Avoid	Ignition sources, excessive heat, and incompatible substances.
Incompatibilities	Oxidizing agents, strong acids
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

Section 11: Toxicological Information**Summary of Effects and Symptoms by Routes of Exposure**

Eyes	Causes redness, pain and eye damage.
Skin	May cause redness, serious skin irritation, allergic contact dermatitis. Triethylenetetramine can be absorbed through skin leading to toxic effects. When heated, hot triethylenetetramine vapors may also result in itching of the face with skin redness (erythema) and swelling (edema).
Inhalation	May cause drowsiness, dizziness, cough, headaches, nausea, unconsciousness.
Ingestion	May cause nausea, sore throat, and diarrhea (see inhalation symptoms).
Chronic	Prolonged or repeated exposure may cause skin dryness, cracking, as well as defatting the skin.

Section continued on the next page

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SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
butan-2-one	2 737 mg/kg Rat	6 480 mg/kg Rabbit	23 500 mg/m ³ 8 h Rat
polyamide polymer	>5 000 mg/kg ^{a)}	>5 000 mg/kg ^{a)}	Not available
propan-2-ol	3 600 mg/kg Rat	12 800 mg/kg Rabbit	16 000 ppm 8 h Rat
1-butanol	790 mg/kg Rat	3 400 mg/kg Rabbit	Not available
triethylenetetramine	2 500 mg/kg Rat	805 mg/kg Rabbit	Not available

Note: Toxicity data from the RTECS² and ECHA databases were consulted. The data from supplier SDSs were also consulted.

a) According to supplier safety data sheet.

Other Toxicological Effects

Skin corrosion/irritation

Polyamide polymer, 1-butanol, and triethylenetetramine are known skin irritants.

Serious eye damage/irritation

Butan-2-one, bisphenol-A, 1-butanol, triethylenetetramine and propan-2-ol are known serious eye irritants.

Sensitization
(allergic reactions)

The epoxy resin component (CAS# 25068-38-6) and triethylenetetramine may cause skin sensitization in humans.

Carcinogenicity
(risk of cancer)

Based on available data, the classification criteria are not met.

Mutagenicity
(risk of heritable genetic effects)

Based on available data, the classification criteria are not met.

Reproductive Toxicity
(risk to sex functions)

Based on available data, the classification criteria are not met.

Teratogenicity (risk of fetus malformation)

Based on available data, the classification criteria are not met.

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****STOT-single exposure**

Butan-2-one, 1-butanol, and propan-2-ol can affect the central nervous system by inhalation causing drowsiness or dizziness.

STOT-repeated exposure

Based on available data, the classification criteria are not met.

Aspiration hazard

Based on available data, the classification criteria are not met. There is less than 10% category 1 components, and the kinematic viscosity is $>20.5 \text{ mm}^2/\text{s}$ at 40°C .

Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (<http://echa.europa.eu>), and other reliable sources.

Butan-1-ol is not classifiable as an environmental toxicant with minimal LC50 96 h of 1 840 mg/L for Pimephales promelas (fathead minnow); and LC40 48 h of 44 mg/L, EC50 72 h of 648 mg/L Daphnia magna (water flea).

The fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines (CAS# 68410-23-1) were classified as a chronic category 2 environmental toxicant (not readily biodegradable, LC50 range of 1–10 mg/L for fish; EC0 bacterial >10 and ≤ 100 mg/L).

Literature values for the triethylenetetramine (CAS # 112-24-3) suggest an acute category 3 aquatic toxicity (LC50, IC50, and EC50 values of >100 mg/L for fish and between 10 and 100 mg/L for algae).

Based on available data, propan-2-ol and butan-2-one (MEK) do not meet the environmental toxicant classification with LC50 and EC50 >100 mg/L.

- Propan-2-ol has a minimal LC50 96 h of 9 640 mg/L for Pimephales promelas (fathead minnow); an EC50 24 h of 5 102 mg/L Daphnia magna (water flea); and an EC50 72 h of 2 000 mg/L Desmodesmus subspicatus (green algae).
- Butan-2-one has a minimal LC50 96 h of 400 mg/L for Pimephales promelas (fathead minnow); LC50 48 h of >520 mg/L and EC50 48 h of 13 500 mg/L for Daphnia magna (water flea).

Acute Ecotoxicity

Category 2

Toxic to aquatic life

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****Chronic Ecotoxicity**

Category 2

Toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage.

Biodegradability

Not expected to be readily biodegradable.

Other Effects

Actual VOC (Volatile Organic Compounds) content according to the US (EPA) and Canadian (CEPA) authorities.

VOC = 67% [573 g/L]

Section 13: Disposal Information

Dispose of contents in accordance with all local, regional, national, and international regulations.

Section 14: Transport Information**Ground****Refer to TDG regulations** (Canadian Transportation of Dangerous Goods regulations);
USA CFR 49 Regulations (Parts 100 to 185).

Sizes 5 L and under

*Part B of 843ER-250ML, 843ER-800ML, 843ER-3.25L kits***Limited Quantity***Section continued on the next page*

843ER-B
SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)
Air
Refer to ICAO-IATA Dangerous Goods Regulations.
Sizes 1 L and under
Part B of 843ER-250ML, 843ER-800ML kit
Limited Quantity

Sizes greater than 1 L up to 5 L
Part B of 843ER-3.25L kit
UN number: UN1139

Shipping Name: COATING SOLUTION

Class: 3

Packing Group: II

Marine Pollutant: Yes

Sea
Refer to IMDG regulations.
Sizes 5 L and under
Part B of 843ER-250ML, 843ER-800ML, 843ER-3.25L kits
Limited Quantity

Sizes greater than 5 L
FOR REFERENCE ONLY
UN number: UN1139

Shipping Name: COATING SOLUTION

Class: 3

Packing Group: II

Marine Pollutant: Yes


Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.

Section 15: Regulatory Information

Canada

Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)

All hazardous ingredients are listed on the DSL.

Hazardous Products Act (R.S.C., 1985, c. H-3)

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

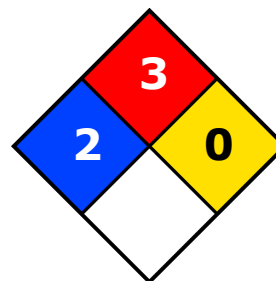
USA

Other Classifications

HMIS® RATING

HEALTH:	*	2
FLAMMABILITY:		3
PHYSICAL HAZARD:		0
PERSONAL PROTECTION:		

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product contains n-butanol (CAS# 67-63-0; reportable quantity = 5 000 lb), and propan-2-ol (CAS# 67-63-0), which are subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

This product contains butan-2-one (CAS# 78-93-3, reportable quantity = 5 000 lb), which can be subject to the CERCLA reporting requirements.

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****TSCA** (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, USA).

This product does not contain any substances known to be listed in California.

Europe**RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

WEEE (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

Section 16: Other Information

SDS Prepared by MG Chemicals' Regulatory Department

Date of Review 14 April 2020

Supersedes 03 March 2020

Reason for Changes: Update to the product name.

Reference

1) ACGIH 2017 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2017).

2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Section continued on the next page

843ER-B**SILVER COATED COPPER EPOXY CONDUCTIVE PAINT (PART B)****Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
ECHA	European Chemicals Agency
EU	European Union
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
IARC	International Agency for Research on Cancer
NOELR	No observable effect loading ratio
NTP	National Toxicology Program
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
SDS	Safety Data Sheet
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

Technical Queries Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

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