SILVER COATED COPPER CONDUCTIVE COATING **843AR-AEROSOL**

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Super Shield™ Silver Coated Copper Conductive Coating

SDS Code: 843AR–Aerosol

Related Part # 843AR-340G

Recommended Use and Restriction on Use

Use: Electrically conductive coating and EMI/RFI shielding

Uses Advised Against: Not available

Details of Manufacturer or Importer

Manufacturer
MG Chemicals
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Burlington, Ontario L7L 5R6
CANADA

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E-MAIL support@mgchemicals.com
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FAX +1-905-331-2682
E-MAIL info@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 CHEMTREC ☎: ***+1-800-424-9300***

For emergencies involving dangerous goods; Collect 24/7
CANADA: Call CANUTEC ☎: ***+1-613-996-6666*** or ****666*** on cellular phones

Section 2: Hazard(s) Identification

Classification of Hazardous Chemical

GHS Categories

Criteria		Category	Signal Word	Pictograms
Flammable Aerosol		2	Warning	Flame
Gas Under Pressure		Liquefied gas	Warning	Gas cylinder
Eye 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	**WARNING**
Pictograms	**Hazard Statements**
	H223: Flammable aerosol
	H280: Contains gas under pressure; may explode if heated
	H319: Causes serious eye irritation H336: May cause drowsiness and dizziness

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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.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P261	Avoid breathing mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/clothing/eye protection/face protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
Response	**Precautionary Statements**
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P391	Collect spillage.
Storage	**Precautionary Statements**
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].
P403	Store in well-ventilated place.
P405	Store locked up.
Disposal	**Precautionary Statements**
P501	Dispose of contents/container in accordance to local/regional/international regulations.

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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
Simple Asphyxiant	May displace oxygen and cause rapid suffocation.	Warning	None

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
67-64-1	acetone	32%
74-98-6	propane	13%
123-86-4	n-butyl acetate	12%
7440-50-8	copper	10%
616-38-6	dimethyl carbonate	9%
75-28-5	isobutane	7%
110-43-0	heptan-2-one [a)]	7%
68410-97-9	distillates (petroleum), light distillate hydrotreating process, low-boiling	2%
108-65-6	1-methoxy-2-propanol acetate	2%
7440-22-4	silver	1%

a) Commonly known as methyl amyl ketone (MAK)

Section 4: First-Aid Measures

Exposure Condition	*GHS Code/Symptoms/Precautionary Statements*
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	*redness, irritation, pain, blurred vision*
Response	Rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

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IF INHALED	P304 + P340, P312
Immediate Symptoms	*cough, drowsiness, dizziness, headaches, nausea, unconsciousness*
Response	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	*nausea, sore throat, abdominal pain, diarrhea, drowsiness, dizziness*
Response	Rinse mouth. Do NOT induce vomiting.
IF ON SKIN	P302 + P352
Immediate Symptoms	*redness, mild irritation, dry skin*
Response	Wash with plenty of water. Take off contaminated clothing and wash it before reuse.

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	Aerosols containers may erupt with force at temperatures above 50 °C [122 °F]. 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. Prevent fire-fighting wash from entering waterway or sewer system.
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/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	Not applicable
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.

Section 7: Handling and Storage

Prevention	Keep out of reach of children.
	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	Avoid breathing mist/vapors/spray. Use only outdoors or in a well-ventilated area.
	Do not eat, drink, or smoke when using this product.
	Do not pierce or burn, even after use.
Handling	Do not spray on an open flame or other ignition source.
	Wear protective gloves/clothing/eye protection.
	Wash hands thoroughly after handling.
	Avoid release to the environment. Collect spillage.
Storage	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].
	Store in well-ventilated place.
	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)
acetone	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	500 ppm 1 000 ppm 500 ppm 250 ppm 500 ppm 750 ppm	750 ppm Not established 750 ppm 500 ppm 750 ppm 1 000 ppm
propane	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	See footnote [a)] 1 000 ppm 1 000 ppm 1 000 ppm 1 000 ppm 1 000 ppm	Not established Not established Not established Not established Not established Not established
n-butyl acetate	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	150 ppm 150 ppm 150 ppm 20 ppm 150 ppm 150 ppm	Not established Not established 200 ppm 200 ppm Not established 200 ppm
copper *(dust and mist)*	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	1.0 mg/m^3 1.0 mg/m^3 1 mg/m^3 1.0 mg/m^3 1 mg/m^3 1 mg/m^3	Not established Not established Not established Not established Not established Not established
isobutane	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	Not established Not established Not established Not established 1 000 ppm Not established	Not established Not established Not established Not established Not established Not established
heptan-2-one *methyl amyl ketone*	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	50 ppm 100 ppm 50 ppm 50 ppm 25 ppm 50 ppm	Not established Not established Not established Not established Not established Not established

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Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
distillates, petrol, light dist hydrotreat process, low-boil.	ACGIH	1 500 mg/m^3	Not established
	U.S.A. OSHA PEL	2 000 mg/m^3	Not established
	Canada AB	1 590 mg/m^3	Not established
	Canada BC	1 500 mg/m^3	Not established
	Canada ON	1 500 mg/m^3	Not established
(Naphta VM&P)	Canada QC	1 370 mg/m^3	Not established
1-methoxy-2-propanol acetate	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	50 ppm	Not established
	Canada AB	Not established	Not established
Not established	Canada BC	50 ppm	75 ppm
	Canada ON	50 ppm	Not established
	Canada QC	Not established	Not established
silver	ACGIH	0.1 mg/m^3	Not established
(metal dust, mist)	U.S.A. OSHA PEL	0.01 mg/m^3	Not established
(metal)	Canada AB	0.1 mg/m^3	Not established
(Ag and its compounds)	Canada BC	0.01 mg/m^3	0.03 mg/m^3
(metal, dust, fumes)	Canada ON	0.1 mg/m^3	Not established
	Canada QC	0.1 mg/m^3	Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from RTECS[2] database 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) Refer to the ACGIH Appendix F: Mininum Oxygen Content for Asphyxia TLV Basis

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 or other chemically resistant gloves.

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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 that your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in Section 3. The respirator should be fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquid, in an aerosol format	**Lower Flammability Limit** c)	2%
Appearance	Light brown metallic	**Upper Flammability Limit** c)	13%
Odor	Acetone-like	**Vapor Pressure @21 °C**	16 kPa [118 mmHg]
Odor Threshold a)	5 ppm	**Vapor Density**	≥2 (Air =1)
pH	Not available	**Specific Gravity @25 °C**	1.2
Freezing/Melting Point	Not available	**Solubility in Water**	Partially miscible
Boiling Point a)	≥56 °C [≥132 °F]	**Partition Coefficient**	Not available
Flash Point a)	-17 °C [1.4 °F]	**Auto-ignition Temperature** b)	≥315 °C [≥599 °F]
Evaporation Rate	Fast	**Decomposition Temperature**	Not available
Flammability (solid, gas)	Not available	**Viscosity @25 °C**	87 cP

a) Based on the acetone component.
b) The auto-ignition value is based on 1-methoxy-2-propanol acetate, which is the component with the lowest value.
c) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle and liquid component LFL and UFL limits

Section 10: Stability and Reactivity

Reactivity	The copper may form shock sensitive compounds in the presence of acetylenic compounds.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Temperatures above 50 °C [122 °F], open flames, and incompatible substances
Incompatibilities	Oxidizing agents, strong acids, peroxides, alkali or alkali earth metals
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

Section 11: Toxicological Information

Routes of Exposure

Eye contact, Ingestion, Inhalation, and Skin contact

Symptoms Summary

Eyes	May cause redness, severe irritation, and pain.
Inhalation	May cause cough, drowsiness, dizziness, headaches, nausea, or unconsciousness.
Ingestion	May cause nausea, sore throat, abdominal pain, and diarrhea (also see inhalation symptoms).
Skin	May cause skin redness, mild irritation, and dry skin.
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
acetone	5 800 mg/kg Rat	20 mL/kg Rabbit [a)]	16 000 ppm 4 h Rat [a)]
propane	Not Applicable	Not Applicable	>800 000 ppm Rat 4 h

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Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
n-butyl acetate	>10 768 mg/kg Rat	>17 600 mg/kg Rabbit	390 ppm 4 h Rat
copper	>481 mg/kg Rat [b)]	<2 000 mg/kg Rabbit	Not established
dimethyl carbonate	>6.4 g/kg Rat & Mouse	>5 000 mg/kg Rabbit	Not established
isobutane	Not applicable	Not applicable	>570 000 ppm Rat 4 h
heptan-2-one	1 670 mg/kg Rat	12 600 μL/kg Rabbit	>16.7 mg/kg 4 h Rat
distillates (petrol.), lt dist. hydrotreat. process, low-boil.	Not established	Not established	Not established
1-methoxy-2-propanol acetate	8 532 mg/kg Rat	>5 g/kg Rabbit	Not established
silver	>2 000 mg/kg Rat	>2 000 mg/kg Rat	5.16 mg/m^3 4 h Rat (dust)

Note: Toxicity data from the RTECS[2] and ECHA databases were consulted. The data from supplier (M)SDS were also consulted.
a) According to supplier safety data sheet
b) Copper flake

Other Toxicological Effects

Skin corrosion/irritation — Based on available data, the classification criteria are not met.

Serious eye damage/irritation — Acetone is a known serious eye irritant. Mixture contains mechanically abrasive particles.

Sensitization (allergic reactions) — Based on available data, the classification criteria are not met.

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.

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Teratogenicity (risk of fetus malformation)	Based on available data, the classification criteria are not met.
STOT-single exposure	Inhalation of acetone, n-butyl acetate, heptan-2-one, and distillates (petroleum), light distillate hydrotreating process, low-boiling may affect the central nervous system.
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.

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 "distillates (petroleum), light distillate hydrotreating process, low-boiling" is an chronic category 2 aquatic toxicant with a LC50 96 h of 8.2 mg/L for Oncorhynchus mykiss (rainbow trout) and an EC50 48 h of 4.5 mg/L for Daphnia magna (water flea), and an EC50 96 h of 3.7 mg/L for Pseudokirchneriella subcapitata (green algae).

The n-butyl acetate ingredient is an acute category 3 environmental toxicant (biodegradable, with minimal LC50 of 18 mg/L for fathead minnow).

Acetone, heptan-2-one, 1-methoxy-2-propanol are not classifiable as an environmental toxicant (with minimal LC50 of >100 mg/L).

- Acetone has a minimal LC50 96 h of 5 540 mg/L for Oncorhynchus mykiss (rainbow trout) and an EC50 48 h of 13 500 mg/L for Daphnia magna (water flea).
- Heptan-2-one has a minimal LC50 96 h of 126 mg/L for Pimephales promelas (fathead minnow).
- The 1-methoxy-2-propanol acetate component has a minimal LC50 96 h of ≥100 mg/L Salmo gairdneri and an EC50 48 h of >500 mg/L for Daphnia magna (water flea).

There is insufficient data to classify dimethyl carbonate for aqueous toxicity.

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Acute Ecotoxicity

Category 2

Toxic to aquatic life

Chronic Ecotoxicity

Category 2

Toxic to aquatic life with long lasting effects.

Avoid release to the environment. Collect spillage.

Biodegradability

Solvent part expected to be biodegradable, but not the polymer or metal filler. The volatile solvent constituents will oxidize rapidly in air by photochemical reaction.

Other Effects

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

Actual VOC = 43% [516 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** (Parts 100 to 185) **Regulations**.	
Limited Quantity	FOR REFERENCE ONLY **UN number**: UN1950 **Shipping Name:** AEROSOL, flammable **Class:** 2.1 **Packing Group**: Not applicable **Marine Pollutant:** Yes Flash Point -17 °C [1.4 °F]

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Air

Refer to ICAO-IATA Dangerous Goods Regulations.	
Limited Quantity	**UN number**: UN1950 **Shipping Name:** AEROSOL, flammable **Class:** 2.1 **Packing Group**: Not applicable **Marine Pollutant:** Yes Flash Point -17 °C [1.4 °F]

Sea

Refer to IMDG regulations.	
Limited Quantity	**UN number**: UN1950 **Shipping Name:** AEROSOL, flammable **Class:** 2.1 **Packing Group**: Not applicable **Marine Pollutant:** Yes Flash Point -17 °C [1.4 °F]

Note: **Shipper must be appropriately <u>trained and certified</u> 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.

Industry and Science Canada

MG Labels products intended for the workplace to conform to WHMIS labeling regulations. Product identification, net quantity declaration, minimum printing type size heights, and packaging of this product are in compliance.

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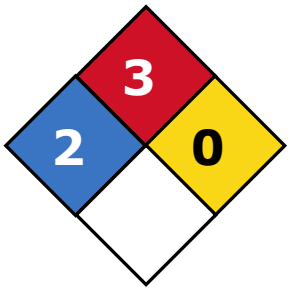
USA

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 products that are listed as hazardous air pollutants.

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

This product contains copper (CAS# 7440-50-8; reportable quantity = 5 000 lb) and silver (CAS# 7440-22-4; reportable quantity = 1 000 lb), 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 acetone (CAS# 67-64-1), which is subject to the CERCLA reporting requirements at the 5 000 lb (2 268 kg) threshold.

TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, June 06, 2014 revision, 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, or PBDE's, 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	Michel Hachey
Date of Review	06 September 2016
Supersedes	15 June 2016
Reason for Changes:	Change of propellant

Reference

1) ACGIH *2013 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 (2013).

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

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

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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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