

841ER-B

(PART B)

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: 841ER-B**Other Means of Identification:** Super Shield™ Nickel Epoxy Conductive Paint**Related Part #** 841ER-250ML, 841ER-1.17L, 841ER-3.25L

Recommended Use and Restriction on Use

Use: Nickel conductive epoxy hardener**Uses Advised Against:** Not applicable

Details of Manufacturer or Importer

Manufacturer

MG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA

MG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
CANADA

☎ +1-800-340-0772**Fax** +1-800-340-0773**E-mail** support@mgchemicals.com**Web** www.mgchemicals.com**☎** +1-905-331-1396**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 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 serviceCANADA—Call CANUTEC collect at **+1-613-996-6666** or ***666** on cellular phones

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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
Specific Target Organ Toxicity	Repeated Exposure	1	Danger	Health
Carcinogenicity		2	Warning	Health
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	3	<i>none</i>	<i>none</i>


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 vapor
	H318: Causes serious eye damage
	H372: Causes damage to lungs through prolonged or repeated exposure by inhalation H351: Suspected of causing cancer

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Pictograms	Hazard Statements
	H315: Causes skin irritation H317: May cause an allergic skin reaction H336: May cause dizziness or drowsiness
No Symbol Mandated	H412: Harmful to aquatic life with long lasting effects
Prevention	Precautionary Statements
P201, P202	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, hot surfaces, sparks, open 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.
P260	Do not breathe mist, vapors, or spray.
P270	Do not eat, drink or smoke when using this product.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves, protective clothing, and eye protection.
P272	Contaminated work clothing should not be allowed out of the workplace.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
Response	Precautionary Statements
P303 + P361 + P352	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with plenty of water or shower.
P370 + P378	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
P305 + P351 + P338, P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

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Response	Precautionary Statements
P308 + P313	IF exposed or concerned: Get medical advice or attention.
P314	Get medical advice or attention if you feel unwell.
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.
P333 + P313	If skin irritation or rash occurs: Get medical advice or attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.
Storage	Precautionary Statements
P403 + P235	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

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
7440-02-0	nickel	27%
78-93-3	2-butanone ^{a)}	22%
68410-23-1	fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines	21%
123-86-4	n-butyl acetate	18%
71-36-3	butan-1-ol	7%
14807-96-6	talc (no asbestos fiber)	3%
112-24-3	triethylenetetramine	2%

a) Also known as methyl ethyl ketone

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	<i>redness, irritation, pain, burn</i>
Response	Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
IF ON SKIN (or hair)	P303 + P361 + P352, P333 + P313, P308 + P313, P363
Immediate Symptoms	<i>redness, irritation, rash, dry skin</i>
Response	Take off immediately all contaminated clothing. Wash with plenty of water or shower. If skin irritation or rash occurs: Get medical advice or attention. IF exposed or concerned: Get medical advice or attention. Wash contaminated clothing before reuse.
IF INHALED	P304 + P340, P312, P308 + P313
Immediate Symptoms	<i>cough, shortness of breath, dizziness, drowsiness, headaches</i>
Response	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell. IF exposed or concerned: Get medical advice or attention.
IF SWALLOWED	P301 + P330, P331, P308 + P313
Immediate Symptoms	<i>abdominal pain, nausea, headaches, dizziness, drowsiness, vomiting</i>
Response	Rinse mouth. Do NOT induce vomiting. IF exposed or concerned: Get medical advice or attention.

Section 5: Fire-Fighting Measures

Response	<p>In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.</p> <p>Use water spray to cool containers.</p>
Specific Hazards	<p>Produces irritating and toxic fumes in fires or in contact with hot surfaces. May produce very toxic nickel carbonyl gas in the presence of carbon monoxide in a reducing atmosphere.</p> <p>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.</p> <p>Prevent fire-fighting wash from entering waterway or sewer system.</p>
Combustion Products	<p>Combustion can produce carbon oxides (CO, CO₂), nickel oxides fumes, and nitrogen oxides (NO_x).</p>
Fire-Fighter	<p>Wear self-contained breathing apparatus and full fire-fighting turn-out gear.</p>

Section 6: Accidental Release Measures

Personal Protection	<p>See personal protection recommendations in Section 8.</p>
Precautions for Response	<p>Do not breathe the mist, spray, or vapors. Remove or keep away all sources of extreme heat or open flames.</p>
Environmental Precautions	<p>Avoid releasing to the environment. Prevent spill from entering drains and waterways.</p>
Containment Methods	<p>Contain with inert absorbent (such as soil, sand, vermiculite).</p>
Cleaning Methods	<p>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.</p>
Disposal Methods	<p>Dispose of spill waste according to Section 13.</p>

Section 7: Handling and Storage

Prevention	<p>Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.</p> <p>Keep container tightly closed.</p> <p>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond container and receiving equipment. Use explosion-proof equipment. Take action to prevent static discharges.</p> <p>Do not breathe mist, vapors, or spray. Do not eat, drink or smoke when using this product.</p> <p>Contaminated work clothing should not be allowed out of the workplace.</p> <p>Avoid release to the environment.</p>
Handling	<p>Wear protective gloves, protective clothing, and eye protection.</p> <p>Take off contaminated clothing and wash it before reuse.</p> <p>Use only outdoors or in a well-ventilated area.</p> <p>Wash hands thoroughly after handling.</p>
Storage	<p>Store in a well-ventilated place. Keep cool.</p> <p>Store locked up.</p>

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)
nickel (dust)	ACGIH	1.5 mg/m ³	Not established
	U.S.A. OSHA PEL	1 mg/m ³	Not established
	Canada AB	1.5 mg/m ³	Not established
	Canada BC	0.05 mg/m ³	Not established
	Canada ON	1 mg/m ³	Not established
	Canada QC	1 mg/m ³	Not established
2-butanone	ACGIH	200 ppm	300 ppm
	U.S.A. OSHA PEL	200 ppm	300 ppm
	Canada AB	200 ppm	300 ppm
	Canada BC	50 ppm	100 ppm
	Canada ON	200 ppm	300 ppm
	Canada QC	150 ppm	300 ppm

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Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
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
butan-1-ol	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
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
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) ^{b)} 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 RTECS² 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) Million particles per cubic foot of air, based on impinge samples counted by light-field technique.

b) Skin—can be absorbed through the skin.

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841ER-B**(PART B)****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.

For incidental contacts, use disposable natural rubber or other chemically resistant gloves.

Respiratory Protection For over-exposures up to 10 x OEL of mist, vapors, or 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.

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Section 9: Physical and Chemical Properties

Physical State	Liquid	Lower Flammability Limit ^{b)}	1%
Appearance	Grey	Upper Flammability Limit ^{b)}	11%
Odor	Ammonia-like	Vapor Pressure @20 °C	Not available
Odor Threshold	0.007 ppm	Vapor Density	>4 (Air =1)
pH	Not available	Relative Density @25 °C	1.19
Freezing/Melting Point	Not available	Solubility in Water	Partially miscible
Initial Boiling Point ^{a)}	≥80 °C [≥176 °F]	Partition Coefficient n-octanol/water	Not available
Flash Point ^{a)}	-9 °C [16 °F]	Auto-ignition Temperature	338 °C [640 °F]
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability	Not available	Viscosity @40°C	<20.5 mm ² /s

a) Based on 2-butanone component

b) Values calculated using Raoult's Law and Le Chatelier principle for solvent components.

Section 10: Stability and Reactivity

Reactivity	The nickel can react vigorously with acids and liberate hydrogen, which can form an explosive mixture in air. Nickel may react with carbon monoxide in a reducing atmosphere to form a very toxic nickel carbonyl gas.
Chemical Stability	Chemically stable at normal temperatures and pressures.
Conditions to Avoid	Ignition sources. Low lying vapors may form explosive mixture with air.
Incompatibilities	Strong oxidizing agents, strong acids, 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 severe irritation, redness, pain, or burns
Skin	Causes skin irritation, redness, rash, or dry skin.
Inhalation	May cause cough, shortness of breath, dizziness, drowsiness, or headaches.
Ingestion	May cause abdominal pain, nausea, vomiting (also see inhalation symptoms).
Chronic	Chronic inhalation exposure to nickel dust may damage lungs.

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
nickel	5 000 mg/kg Rat	Not available	Not available
2-butanone	2 737 mg/kg Rat	6 480 mg/kg Rabbit	23.5 mg/L 8 h Rat
Fatty acids, C18-unsatd., dimers...	>2 000 mg/kg Rat	>2 000 mg/kg Rat	Not available
n-butyl acetate	>10 768 mg/kg Rat	>17 600 mg/kg Rabbit	390 ppm 4 h Rat
butan-1-ol	790 mg/kg Rat	3 400 mg/kg Rabbit	Not available
talc	Not available	Not available	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 SDS were also consulted.

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841ER-B**(PART B)****Other Toxicological Effects**

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Butan-1-ol, triethylenetetramine and fatty acids, C18-unsatd., dimers cause serious eye damage.
Sensitization (allergic reactions)	Exposure to the epoxy hardener, nickel, and triethylenetetramine may cause an allergic skin reaction.
Carcinogenicity (risk of cancer)	Nickel is classified as a suspect carcinogen based on animal intratracheal instillation (intubation) or interperitoneal (in body cavity) injection studies. A reliable 2008 study by Oller <i>et al.</i> shows no carcinogenicity for the nickel metal via normal inhalation route. Nickel [7440-02-0] IARC Group 2B: Possibly carcinogenic to humans ACGIH A5: Not suspected as a human carcinogen CA Prop 65: Listed as a carcinogen NTP: Reasonably anticipated to be human carcinogen
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	2-butanone, N-butyl acetate and butan-1-ol can affect the central nervous system by inhalation causing drowsiness or dizziness, and they are a respiratory system irritant.
STOT-repeated exposure	Inhalation dust/mist containing nickel particles of less than 0.1 mm may cause chronic inflammation, lung fibrosis, and accumulation of the nickel particles.
Aspiration hazard	Based on available data, the classification criteria are not met.

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.

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

Contains nickel of less than a 1 µm but more than 100 nm (larger than nanoparticles), which release ionic silver levels that are harmful to the environment. While massive nickel is insoluble in water, its powder is 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 3 assignment of the EU.

The fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines (CAS# 68410-23-1) was classified as an acute category 2 environmental toxicant due to supplier reported LC50 range of 1–10 mg/L for fish.

- Butan-1-ol is not classifiable as an environmental toxicant with minimal LC50 of 1 840 mg/L for Pimephales promelas (fathead minnow) 96 h; and LC40 of 44 mg/L 48 h, EC50 648 mg/L Daphnia magna (water flea) 72 h.
- Literature for the triethylenetetramine (CAS # 112-24-3) suggest low aquatic toxicity (LC50, IC50, and EC50 values of >100 mg/L for fish and between 10 and 100 for algae).

Acute Ecotoxicity

Category 3

Harmful to aquatic life

Chronic Ecotoxicity

Category 3

Harmful to aquatic life with long lasting effects

Avoid release to the environment.

Biodegradability

Not readily biodegradable

Other Effects

VOC (Regulated Volatile Organic Content) = 70% [835 g/L]

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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
841ER-250ML, 841ER-1.17L,
841ER-3.25L

Limited Quantity



Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 0.5 L and under*
841ER-250ML, 841ER-1.17L

Limited Quantity

Total net per
package 1 L



Sizes up to 5 L (passenger), 60 L (cargo)
841ER-3.25L

UN number: UN1263

Shipping Name: PAINT

Class: 3

Packing Group: II

Marine Pollutant: No



*Inner container max in combination package of 1 L net quantity.

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Sea

Refer to IMDG regulations.

Sizes 5 L and under
841ER-250ML, 841ER-1.17L,
841ER-3.25L
Limited Quantity



Sizes greater than 5 L

UN number: UN1263
Shipping Name: PAINT
Class: 3
Packing Group: II
Marine Pollutant: No



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/NDSL.

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.

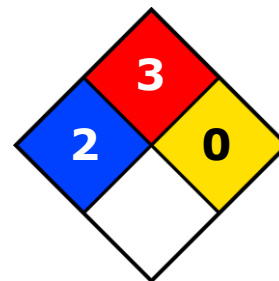
USA

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)

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841ER-B**(PART B)****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-butyl acetate (CAS# 123-86-4; reportable quantity = 5 000 lb [2 268 kg]), n-butanol (CAS# 71-36-3; reportable quantity = 5 000 lb [2 268 kg]), and nickel (CAS# 7440-02-0, reportable quantity = 100 lb [45.4 kg]), which are subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

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 contains nickel (CAS# 7440-02-0), which is listed as a carcinogen.

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 it is therefore not governed by this regulation.

Section 16: Other Information

SDS Prepared by	MG Chemical's Regulatory Department
Date of Creation	28 January 2020
Supersedes	12 June 2018
Reason for Changes:	Emergency response number change.

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841ER-B**(PART B)****References**

- 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®)

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
PEL	Permissible Exposure Limit
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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