

8331-B

(PART B)

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 8331-B**Other Means of Identification:** Silver Conductive Epoxy Adhesive**Related Part #** 8331-14G, 8331-50ML, 8331-200ML (withdrawn: 8331-429G, 8331-454G)

Recommended Use and Restriction on Use

Use: Electrically conductive epoxy adhesive hardener part for use with resins**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
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 service
CANADA—Call CANUTEC collect at **+1-613-996-6666** or ***666** on cellular phones

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Section 2: Hazard(s) Identification
Classification of the Chemical Material
GHS Categories

| Criteria | | Category | Signal Word | Pictograms |
|--------------------------------------|---------|----------|-------------|-------------|
| Eye Damage | | 1 | Danger | Corrosion |
| Skin Corrosion | | 1B | Danger | Corrosion |
| Sensitization | Skin | 1 | Warning | Exclamation |
| Acute Toxicity | Oral | 4 | Warning | Exclamation |
| Reproductive Toxicity | | 2 | Warning | Health |
| 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 |
|  | H314: Causes severe skin burns and eye damage |
|  | H317: May cause an allergic skin reaction H302: Harmful if swallowed |
|  | H361: Suspected of damaging fertility or the unborn child |

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| Pictograms | Hazard Statements |
|--|--|
|  | H410: Very toxic to aquatic life with long lasting effects |
| Prevention | Precautionary Statements |
| P102 P201 P202 P260 P280 P264 P270 P272 P273 | Keep out of reach of children. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe fumes/vapors. Wear protective gloves/eye protection. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. |
| Response | Precautionary Statements |
| P308 + P313 P305 + P351 + P338, P310 P301+ P330 + P331, P310 P303 + P361 + P353, P310 P363 P333 + P313 P304 + P340, P310 P391 | If exposed or concerned: Get medical advice/attention. 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. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. Collect spillage. |

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| Storage | Precautionary Statements |
|-----------------|--|
| P405 | Store locked up. |
| Disposal | Precautionary Statements |
| P501 | Dispose of contents/container in accordance to local/regional/international regulations. |

Hazards Not Otherwise Classified

| Other Criteria | Hazard Statements/Precautionary Statement | Signal Word | Pictograms |
|-----------------------|--|--------------------|-------------------|
| Argyria | Long term ingestion or inhalation of silver can lead to an irreversible blue-grey discoloration of the skin. | <i>None</i> | <i>None</i> |

Section 3: Composition/Information on Ingredients

| CAS # | Chemical Name | %(weight) |
|--------------|--|------------------|
| 7440-22-4 | silver | 67% |
| 84852-15-3 | 4-nonyl phenol, branched | 22% |
| 140-31-8 | 1-piperazineethanamine | 7% |
| 68411-71-2 | diethylene triamine, reaction product with diglycidyl ether of bisphenol A | 1% |
| 111-40-0 | diethylene triamine | 1% |
| 80-05-7 | 4,4'-isopropylidenediphenol | 1% |

Section 4: First-Aid Measures

| <i>Exposure Condition</i> | <i>GHS Code: Precautionary Statement</i> |
|---------------------------|--|
| IF IN EYES | P305 + P351 + P338, P310 |
| Immediate Symptoms | <i>redness, severe irritation, pain, burns</i> |
| Response | Rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. |

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| | |
|--------------------------------------|--|
| IF SWALLOWED | P301 + P330, P331, P310 |
| Immediate Symptoms | <i>severe irritation, burns to mouth, throat, stomach</i> |
| Response | Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTRE/doctor. |
| IF ON SKIN | P303 + P361+ P353, P310, P333 + P313, P363 |
| Immediate or Delayed Symptoms | <i>redness, rash (allergic contact dermatitis), severe irritation, pain, burns, blistering</i> |
| Response | Take off immediately all contaminated clothing. Wash with plenty of water/shower. Immediately call a POISON CENTRE/doctor. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. |
| IF INHALED | P304 + P340, P310 |
| Immediate Symptoms | <i>cough, severe irritation or burns of the respiratory track</i> |
| Response | Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTRE/doctor. |

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 | Not flammable or combustible, but will burn if involved in a fire. Produces irritating smoke and toxic smoke in fires. Inhalation of silver oxide fumes may cause metal fever and irritate the respiratory tract. The flu-like symptoms of metal fever may be delayed, occurring 4 to 12 hours after exposure. Prevent fire-fighting wash from entering waterway or sewer system. |
| Combustion Products | Produces carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), amines, silver oxide fumes and other toxic fumes. |
| Fire-Fighter | Wear self-contained breathing apparatus and full fire-fighting turn-out gear. |

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Section 6: Accidental Release Measures

| | |
|----------------------------------|--|
| Personal Protection | Use personal protection recommended in Section 8. |
| Precautions for Response | Do not breathe fumes/vapors. Keep away from extreme heat or open flames. |
| Environmental Precautions | Avoid releasing to the environment. Prevent spill from entering drains and waterways. Do not flush to sewer. |
| Containment Methods | None required—this product is not readily flowable |
| Cleaning Methods | Collect liquid in a sealable container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wipe remaining residue with a paper towel wetted with alcohol (or other suitable organic solvent) and place dirty towels in container. Wash spill area with soap and water to remove the last traces of residue. RECOMMENDATION: Use a plastic, stainless steel, or carbon steel container. Avoid containers with copper, aluminum, zinc, or galvanized surfaces since the waste mater can slowly oxidize them. |
| Disposal Methods | Dispose spill waste according to Section 13. |

Section 7: Handling and Storage

| | |
|-------------------|---|
| Prevention | Keep out of reach of children. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse. Do not breathe fumes/vapors. Do not eat, drink, or smoke when using this product. Avoid release to the environment. |
| Handling | Wear protective gloves/eye protection. Wash hands thoroughly after handling. Collect spillage. |
| Storage | Store locked up. |

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

| Chemical Name | Country or Vendor | Long Term Exposure Limits (PEL) | Short Term Exposure Limits (STEL) |
|---|--------------------------|--|--|
| silver (metal dust, mist) (metal) (Ag and its compounds) (metal, dust, fumes) | ACGIH | 0.1 mg/m ³ | Not established |
| | U.S.A. OSHA PEL | 0.01 mg/m ³ | Not established |
| | Canada AB | 0.1 mg/m ³ | Not established |
| | Canada BC | 0.01 mg/m ³ | 0.03 mg/m ³ |
| | Canada ON | 0.1 mg/m ³ | Not established |
| | Canada QC | 3 mg/m ³ | Not established |
| diethylene triamine | ACGIH | 1 ppm (Skin) | Not established |
| | U.S.A. OSHA PEL | Not established | Not established |
| | Canada AB | 1 ppm (Skin) | Not established |
| | Canada BC | 1 ppm (Skin) (S) | Not established |
| | Canada ON | 1 ppm (Skin) | Not established |
| | Canada QC | 1 ppm (Skin) | 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 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.

Skin—can be absorbed through the skin

S—Sensitizer

Engineering Controls
Ventilation

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

Because the silver flakes and diethylene triamine are bound in the adhesive mixture, they do not present an airborne hazard under normal use.

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8331-B**(PART B)****Personal Protective Equipment****Eye protection**

Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Use safety glasses with lateral protection (side shields).

Skin Protection

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

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

Respiratory Protection

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

Above 10 x OEL or if the worker is allergic, use a full mask, positive-pressure, air-supplied respirator or a self-contained breathing apparatus.

If the product is heated or worker has a known allergic reaction, consider using a full mask with organic vapor cartridge or with an independent air supply.

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 | Solid | Lower Flammability Limit | Not available |
| Appearance | Silver grey, paste | Upper Flammability Limit | Not available |
| Odor | Amine-like | Vapor Pressure @25 °C | Not available |
| Odor Threshold | Not available | Vapor Density | Not available |
| pH | Not available | Relative Density @25 °C | 2.4 |
| Freezing/Melting Point | Not available | Solubility in Water | Practically insoluble |
| initial Boiling Point | Not available | Partition Coefficient n-octanol/water | Not available |
| Flash Point ^{a)} | 93.3 °C [200 °F] | Auto-ignition Temperature | Not available |
| Evaporation Rate | Not available | Decomposition Temperature | Not available |
| Flammability | Non Flammable | Viscosity @40 °C | >20.5 mm ² /s |

a) Setaflashed closed cup for hardener components

Section 10: Stability and Reactivity

| | |
|----------------------------|--|
| Reactivity | Reacts exothermically with epoxide groups. |
| Chemical Stability | Chemically stable at normal temperatures and pressures |
| Conditions to Avoid | Incompatible substances and excessive heat |
| Incompatibilities | Strong oxidizing agents, strong acids, strong bases, ammonia |
| Polymerization | Will not occur |
| Decomposition | For thermal decomposition, see combustion products in Section 5. |

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

| | |
|-------------------|---|
| Eyes | May causes redness, severe eye irritation, pain, or corrosive eye damage. Contains mechanically abrasive particles. |
| Skin | May cause redness, serious skin irritation, allergic contact dermatitis, chemical burns, and blistering. |
| Inhalation | May cause cough and severe respiratory irritation. |
| Ingestion | May cause severe irritations or burns to mouth, throat, and stomach (see inhalation symptoms). |
| Chronic | Prolonged and repeated exposure may lead to skin sensitization and to reproductive toxicity. Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin. |

Lethal Exposure Concentrations

| Chemical Name | LD50 oral | LD50 dermal | LC50 inhalation |
|--|-----------------------|------------------------|-----------------------------------|
| silver | >5 g/kg Guinea Pig | >2 000 mg/kg Rabbit | 5.16 mg/L Rat ≥4 h (dust) |
| 4-nonyl phenol, branched | 1 300 mg/kg Rat | >3 160 mg/kg | Not available |
| 1-piperazineethanamine | 2 140 µl/kg Rat | 866 mg/kg Rabbit | Not available |
| diethylene triamine, reaction product with diglycidyl ether of Bisphenol A | Not available | Not available | Not available |
| diethylene triamine | 1 080 mg/kg Rat | 1 090 mg/kg Rabbit | Not available |
| 4,4'-isopropylidenediphenol | 2 400 mg/kg Rat | 3 mL/kg Rabbit | >170 mg/m ³ Rat 6 h |

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

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8331-B**(PART B)****Other Toxicological Effects**

| | |
|--|---|
| Skin corrosion/irritation | The 4-nonyl phenol, branched; diethylene triamine; and 1-piperazineethanamine cause skin burns. |
| Serious eye damage/irritation | The 4-nonyl phenol, branched; diethylene triamine; and 1-piperazineethanamine cause eye damage. |
| Respiratory and skin sensitization (allergic reactions) | The 1-piperazineethanamine and 4,4'-isopropylidenediphenol may cause skin sensitization. |
| Carcinogenicity (risk of cancer) | None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP. |
| 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) | The 4-nonyl-phenol, branched and 4,4'-isopropylidenediphenol are suspected of being reproductive toxicants. |
| STOT-single exposure | Based on available data, the classification criteria are not met. |
| 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. The mixture does not contain components classified as aspiration hazards and the kinematic viscosity of the mixture is >20.5 mm ² /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.

Contains silver particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver levels that is very toxic to the environment. While massive silver is insoluble in water, its powders is considered sufficiently soluble to give rise to an ecological hazard by EU48 regulators. The classification that follows takes into account to chronic aqueous toxicity of category 1 (M = 10 for silver) of the EU.

The 4-nonyl phenol, branched, ingredient has a chronic aqueous toxicity of category 1 according to the minimal LC50 96 h of 0.135 mg/L *Lepomis macrochiru*.

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The 4,4'-isopropylidenediphenol ingredient is a category 2 aqueous pollutant according to the minimal 96 h LC50 of 4.6 mg/L for Pimephales promelas (fathead minnow); EC50 48 h of 10.2 mg/L Daphnia Magna (water flea); and EC50 96 h of 2.73 for Pseudokirchneriella subcapitata (green algae).

The 1-piperazineethanamine (CAS# 140-31-8) is a category 4 aqueous pollutant according to the minimal 96 h LC50 of 2190 mg/L for Pimephales promelas (fathead minnow); EC50 48 h of 58 mg/L Daphnia Magna (water flea); EC50 72 h of 465 mg/L for Selenastrum capricornutum.

Diethylene triamine (CAS# 90-72-2) is not classified as an aqueous pollutant according to available data.

Acute Ecotoxicity

Category 1

Very toxic to aquatic life

Chronic Ecotoxicity

Category 1

Very toxic to aquatic life with long lasting effect

Avoid release to the environment. Collect spillage.

Persistence and Biodegradability

Not available

Bioaccumulative Potential

Not available

Mobility in Soil

Not available

Other Effects

Not available

Section 13: Disposal Considerations

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

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Section 14: Transport Information

Ground

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

Sizes 1 kg and under

8331-14G, 8331-50ML, 8331-200ML

Limited Quantity



Sizes greater than 1 kg

FOR REFERENCE ONLY

UN number: UN3263

Shipping Name:

CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched; amino-
ethylpiperazine; silver powder <1 mm)

Class: 8

Packing Group: II

Marine Pollutant: Yes



Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 30 g and under

8331-14G

Excepted Quantity

Document as class **E2**

Max Net Qty/Outer Pkg =
500 g



Sizes greater than 1 kg up to 15 kg

FOR REFERENCE ONLY

UN number: UN3263

Shipping Name:

CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched; amino-
ethylpiperazine; silver powder < 1 mm)

Class: 8

Packing Group: II

Marine Pollutant: Yes



Sizes 1 kg and under

8331-50ML, 8331-200ML

Limited Quantity



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Sea

Refer to IMDG regulations.

Sizes 30 g and under

8331-14G

Excepted Quantity

Document as class

E2



Max Net Qty/Outer Pkg

= 500 g

Sizes greater than 1 kg

FOR REFERENCE ONLY

UN number: UN3263

Shipping Name:

CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched; amino-ethylpiperazine; silver powder < 1 mm)

Class: 8

Packing Group: II

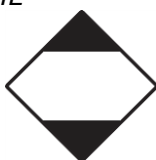
Marine Pollutant: Yes



Sizes 1 kg and under

8331-50ML, 8331-200ML

Limited Quantity



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.

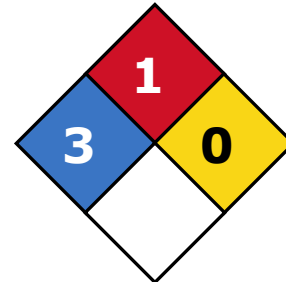
Hazardous Products Act (R.S.C., 1985, c. H-3)

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

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USA
Other Classifications
HMIS® RATING

| | |
|-----------------------------|------------|
| HEALTH: | * 3 |
| FLAMMABILITY: | 1 |
| 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), which is subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

This product contains 4,4'-isopropylidenediphenol (CAS# 80-05-7), which is subject to the reporting requirements of section 313 of the SARA Title III.

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 4,4'-isopropylidenediphenol (CAS# 80-05-7), which is listed as a reproductive hazard.

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8331-B**(PART B)****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 Chemical's Regulatory Department |
| Date of Revision | 09 March 2020 |
| Supersedes | 23 May 2018 |
| Reason for Changes: | Update to the emergency phone number information. |

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®)

Abbreviations

| | |
|-------|---|
| ACGIH | American Conference of Governmental Industrial Hygienists (USA) |
| EC50 | Half maximal effective concentration |
| GHS | Globally Harmonized System of Classification of Labeling of Chemicals |
| IARC | International Agency for Research on Cancer |
| LC50 | Lethal Concentration 50% |
| LD50 | Lethal Dose 50% |
| NTP | National Toxicology Program |
| 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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8331-B**(PART B)**

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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