

4223F

(AEROSOL)

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 4223F**Other Means Of Identification:** Premium Polyurethane Conformal Coating (Aerosol)**Related Part #** 4223F-312G

Recommended Use and Restriction on Use

Use: Protective dielectric coating for printed circuit boards**Uses Advised Against:** Not available

Details of Manufacturer or Importer

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

| | |
|---|--|
|  | +1-800-340-0772 |
| FAX | +1-800-340-0773 |
| E-MAIL | support@mgchemicals.com |
| WEB | www.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 Hazardous Chemical
GHS Categories

| Criteria | Category | Signal Word | Pictograms |
|---|---------------|-------------|--------------|
| Flammable Aerosol | 2 | Warning | Flame |
| Gas Under Pressure | Liquefied Gas | Warning | Gas Cylinder |
| Skin Irritation | 2 | Warning | Exclamation |
| Specific Target Organ Toxicity Single exposure | 3 | Warning | Exclamation |
| Hazardous to the Aquatic Environmental Acute | 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 | WARNING |
|---|---|
| Pictograms | Hazard Statements |
|  | H223: Flammable aerosol |
|  | H229: Pressurized container: may burst if heated |
|  | H315: Causes skin irritation H336: May cause dizziness or drowsiness |
|  | H400: Very toxic to aquatic life |

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Continued...

| Prevention | Precautionary Statements |
|--------------------|---|
| P210 | Keep away from heat, hot surfaces, sparks, open 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 + P271 | Avoid breathing mist, vapors, and spray. Use only outdoors or in well ventilated area. |
| P264 | Wash hands thoroughly after handling. |
| P280 | Wear protective gloves, eye protection, and face protection. |
| P273 | Avoid release to the environment. |
| Response | Precautionary Statements |
| P303 + P352 | IF ON SKIN: Wash with plenty of water. |
| P332 + P313 | If skin irritation occurs: Get medical advice or attention. |
| P362 + P364 | Take off contaminated clothing and wash it before reuse. |
| 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 |
| Storage | Precautionary Statements |
| P410 + P412 | Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F]. |
| 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. |

Other Hazards

| Other Criteria | Hazard Statements/Precautionary Statement | Signal Word | Pictograms |
|-----------------------|---|--------------------|-------------------|
| Simple Asphyxiant | May displace oxygen and cause rapid suffocation. | Warning | None |
| Defats skin | Repeated exposure may cause skin dryness or cracking. | None | None |

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Section 3: Composition/Information on Ingredients

| CAS # | Chemical Name | %(weight) |
|-----------|---------------------------|-----------|
| 142-82-5 | n-heptane | 27% |
| 8052-41-3 | Stoddard solvent | 20% |
| 74-98-6 | propane | 20% |
| 75-28-5 | isobutane | 11% |
| 78-93-3 | butan-2-one ^{a)} | 4% |

a) Also known as methyl ethyl ketone (MEK)

Section 4: First-Aid Measures

| <i>Exposure Condition</i> | <i>GHS Code/Symptoms/Precautionary Statements</i> |
|-----------------------------|--|
| IF ON SKIN (or hair) | P303 + P352, P332 + P313, P362 + P364 |
| Immediate Symptoms | <i>irritation, dry skin, redness</i> |
| Response | Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse. |
| IF INHALED | P304 + P340, P312 |
| Immediate Symptoms | <i>cough, irritation of the respiratory track, 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 IN EYES | P305 + P351 + P338, P337 + P313 |
| Immediate Symptoms | <i>mild irritation, redness</i> |
| Response | Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. |
| IF SWALLOWED | P301 + P330 + P331, 308 + P313 |
| Immediate Symptoms | <i>abdominal pain, nausea, headaches, dizziness, drowsiness, vomiting</i> |
| Response | Rinse mouth. Do NOT induce vomiting. If feeling unwell or concerned: Get medical advice or attention. |

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(AEROSOL)**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]. Vapors are heavier than air, and may travel to sources of ignition near the ground. They can cause flash fire or ignite explosively. |
| Combustion Products | Produces carbon oxides (CO,CO ₂). |
| Fire-Fighter | Wear self-contained breathing apparatus and full fire-fighting turn-out gear. |

Section 6: Accidental Release Measures

| | |
|----------------------------------|---|
| Personal Protection | Use personal protection recommended in Section 8. |
| Precautions for Response | Remove all sources of ignition. Avoid breathing the vapors, mist, and spray. Do not flush to sewer. |
| Environmental Precautions | Avoid release to the environment. Prevent spill from entering drains and waterways. Collect spillage. |
| 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. RECOMMENDATION: Use a grounded stainless steel or carbon steel container. |
| Disposal Methods | Dispose of spill waste according to Section 13. |

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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.

Do not spray on an open flame or other ignition source.

Do not pierce or burn, even after use.

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

Handling

Wear protective gloves, protective clothing, and eye protection.

Take off contaminated clothing and wash it before reuses.

Wash hands thoroughly after handling.

Avoid release to the environment.

Storage

Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].

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 | Long Term Exposure Limits (PEL) | Short Term Exposure Limits (STEL) |
|------------------|-----------------|---------------------------------|-----------------------------------|
| n-heptane | ACGIH | 400 ppm | 500 ppm |
| | U.S.A. OSHA PEL | 500 ppm | Not established |
| | Canada AB | 400 ppm | 500 ppm |
| | Canada BC | 400 ppm | 500 ppm |
| | Canada ON | 400 ppm | 500 ppm |
| | Canada QC | 400 ppm | 500 ppm |
| Stoddard solvent | ACGIH | 100 ppm | Not established |
| | U.S.A. OSHA PEL | 500 ppm | Not established |
| | Canada AB | 100 ppm | Not established |
| | Canada BC | 290 mg/m ³ | 580 mg/m ³ |
| | Canada ON | 100 ppm | Not established |
| | Canada QC | 100 ppm | Not established |

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Continued...

| Chemical Name | Country | Long Term Exposure Limits (PEL) | Short Term Exposure Limits (STEL) |
|--|-----------------|--|--|
| propane | ACGIH | See footnote ^{a)} | Not established |
| | U.S.A. OSHA PEL | 1000 ppm | Not established |
| | Canada AB | 1000 ppm | Not established |
| | Canada BC | 1000 ppm | Not established |
| | Canada ON | 1000 ppm | Not established |
| | Canada QC | 1000 ppm | Not established |
| isobutane <i>alkane (C2-C4)</i> <i>aliphatic hydrocarbon gas</i> | ACGIH | See footnote ^{a)} | Not established |
| | U.S.A. OSHA PEL | Not established | Not established |
| | Canada AB | 1 000 ppm | Not established |
| | Canada BC | 1 000 ppm | Not established |
| | Canada ON | 800 ppm | Not established |
| | Canada QC | Not established | Not established |
| butan-2-one | ACGIH | 200 ppm | Not established |
| | 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 |

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 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) Refer to the ACGIH Appendix F: Mininam 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.

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4223F**(AEROSOL)****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 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, aerosol format | Lower Flammability Limit ^{b)} | 2% |
| Appearance | Clear | Upper Flammability Limit ^{b)} | 9% |
| Odor | Mild petroleum | Vapor Pressure @20 °C | Not available |
| Odor Threshold | Not available | Vapor Density | >2 (Air =1) |
| pH | Not available | Relative Density @25 °C | 0.80 |
| Freezing/Melting Point | Not available | Solubility in Water | Partially soluble |
| Initial Boiling Point | 80 °C [176 °F] | Partition Coefficient n-octanol/water | Not available |
| Flash Point ^{a)} | -3 °C [27 °F] | Auto-ignition Temperature ^{c)} | 223 °C [433 °F] |
| Evaporation Rate | Not available | Decomposition Temperature | Not available |
| Flammability | Flammable | Viscosity ^{d)} @25 °C | >20.5 mm ² /s |

- a) Lowest liquid component literature value, which corresponds to butan-2-one
 b) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle using component data.
 c) Based on n-heptane literature value, which is the component with the lowest ignition value
 d) Calculated value based on liquid components.

Section 10: Stability and Reactivity

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

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

| | |
|-------------------|---|
| Eyes | May cause eye redness or mild irritation. |
| Skin | Causes mild to moderate skin irritation, dryness, or redness. |
| Inhalation | May cause cough, irritation of the respiratory tract, dizziness, drowsiness, and headaches. In extreme dose, may cause unconsciousness. |
| Ingestion | May cause abdominal pain, nausea, and vomiting (also see inhalation symptoms). |
| Chronic | Prolonged and repeated exposure may cause dermatitis, defatting of the skin. |

Acute Toxicity (Lethal Exposure Concentrations)

| Chemical Name | LD50 oral | LD50 dermal | LC50 inhalation |
|----------------------|---------------------|------------------------|--------------------------------------|
| n-heptane | ≥5 000 mg/kg Rat | ≥2 000 mg/kg Rabbit | 103 mg/L 4 h Rat |
| Stoddard solvent | >5 000 mg/kg Rat | >3 000 mg/kg Rat | 14 000 ppm 8 h Rat |
| propane | Not applicable | Not applicable | >800 000 ppm 15 min Rat |
| isobutane | Not applicable | Not applicable | 658 000 mg/m ³ 4 h Rat |
| butan-2-one | 2 737 mg/kg Rat | 6 480 mg/kg Rabbit | 23 500 mg/m ³ 8 h Rat |

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

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(AEROSOL)**Other Toxicological Effects**

| | |
|--|---|
| Skin corrosion/irritation | The n-heptane and Stoddard solvent are mild to moderate skin irritants. |
| Serious eye damage/irritation | Based on available data, the classification criteria are not met. |
| 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. |
| Teratogenicity (risk of fetus malformation) | Based on available data, the classification criteria are not met. |
| STOT-single exposure | The n-heptane, Stoddard solvent and butan-2-one 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. The mixture has a calculated kinematic viscosity of >20.5 mm ² /s. |

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-heptane component is an acute category 2 aquatic toxicant with minimal LC50 96 h of 4 mg/L for *Carassius auratus* (gold fish); EC 50 48 h of 13 500 mg/L for *Daphnia magna* (water flea).

The Stoddard solvent is a chronic category 2 environmental toxicant.

Propane, isobutane, and butan-2-one (MEK) are not classifiable as an environmental toxicant (with minimal LC50 of >100 mg/L).

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Acute Ecotoxicity

Category 1

Very toxic to aquatic life

Avoid release of the environment.

Chronic Ecotoxicity

Available data doesn't give rise to classification as a chronic ecotoxicant.

Biodegradability

Not available

Other Effects

VOC (EPA, WHIMS, and Europe) = 80% [575 g/L]

*VOC = Volatile Organic Content

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 (Canadian Transportation of Dangerous Goods regulations) and **USA DOT 49 CFR** (Parts 100 to 185) **Regulations.**
Limited Quantity



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(AEROSOL)**Air****Refer to ICAO-IATA Dangerous Goods Regulations.****Limited Quantity***FOR REFERENCE ONLY***UN number:** UN1950**Shipping Name:**

AEROSOLS, flammable

Class: 2.1**Packing Group:** Not applicable**Marine Pollutant:** Yes**Sea****Refer to IMDG regulations.****Limited Quantity***FOR REFERENCE ONLY***UN number:** UN1950**Shipping Name:**

AEROSOLS, flammable

Class: 2.1**Packing Group:** Not applicable**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/NDSL.

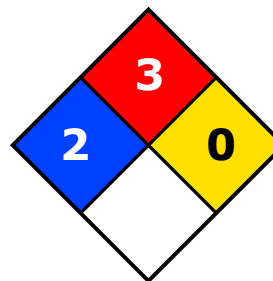
Hazardous Products Act (R.S.C., 1985, c. H-3)

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

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4223F**(AEROSOL)****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 butan-2-one (CAS# 78-93-3, reportable quantity = 5 000 lb), which is 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 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.

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Section 16: Other Information

| | |
|----------------------------|-------------------------------------|
| SDS Prepared by | MG Chemical's Regulatory Department |
| Date of Review | 18 May 2022 |
| Supersedes | 05 March 2020 |
| Reason for Changes: | Update to flash and boiling point. |

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 |
| 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.
Email: support@mgchemicals.com

Mailing Addresses *Manufacturing & Support*
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Burlington, Ontario, Canada
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4223F**(AEROSOL)****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.