

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Premium Polyurethane Conformal Coating**SDS Code:** 4223F-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
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 accidentsUSA or CANADA: Call CHEMTREC ☎: **+1-800-424-9300****For emergencies involving dangerous goods;** Collect 24/7CANADA: Call CANUTEC ☎: **+1-613-996-6666** or ***666** on cellular phones

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

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	Liquefied Gas	Warning	Gas Cylinder
Skin Irritation		2	Warning	Exclamation
Specific Target Organ Toxicity	Single exposure	3	Warning	Exclamation
Environmental Hazard	Acute Aqua. Tox.	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

Section continued on the next page

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

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Prevention	Precautionary Statements
P210	Keep away from heat/sparks/open flames/hot surfaces. 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/spray/fumes. Use only outdoors or in well ventilated area.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/eye protection/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/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/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 well ventilated place. Keep cool.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents/container in accordance to local/regional/international regulations.

Other Hazards

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

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

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/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/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/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.

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-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,CO₂).
- 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/fumes. 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.

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

Section 7: Handling and Storage

- Prevention** Keep out of reach of children.
- Keep away from heat/sparks/open flames/hot surfaces. 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/spray/fumes. Use only outdoors or in well ventilated area.
- Handling** Wear protective gloves/clothing/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 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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PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

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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	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	Not established	Not established
	Canada AB	Not established	Not established
	Canada BC	Not established	Not established
	Canada ON	1000 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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PREMIUM POLYURETHANE CONFORMAL COATING 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 your respirator has filter cartridges appropriate for the ingredients listed in section 3 of this SDS, and that the respirator is fitted to the employee by a professional.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL
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	Specific Gravity @25 °C	0.72
Freezing/Melting Point	Not available	Solubility in Water	Partially soluble
Boiling Point	-3 °C [27 °F]	Partition Coefficient	Not available
Flash Point^{a)}	80 °C [176 °F]	Auto-ignition Temperature^{c)}	223 °C [433 °F]
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	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.

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

Section 11: Toxicological Information

Routes of Exposure

Eye contact, Ingestion, Inhalation, and Skin contact

Symptoms Summary

- 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 ^{a)}	≥2 000 mg/kg Rabbit ^{a)}	103 mg/L Rat 4 h
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 Rat 15 min
isobutane	Not applicable	Not applicable	658 000 mg/m ³ Rat 4 h
butan-2-one	2 737 mg/kg Rat	6 480 mg/kg Rabbit	23 500 mg/m ³ 8h Rat

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

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PREMIUM POLYURETHANE CONFORMAL COATING 4223F-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 $>>20.5 \text{ mm}^2/\text{s}$.

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 $>100 \text{ mg/L}$).

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PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL**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****UN number:** UN1950**Shipping Name:**
AEROSOLS, flammable**Class:** 2.1**Packing Group:** Not applicable**Marine Pollutant:** Yes*Section continued on the next page*

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL**Air**

Refer to ICAO-IATA Dangerous Goods Regulations.

Limited Quantity

**UN number:** UN1950
Shipping Name:
AEROSOLS, flammable
Class: 2.1
Packing Group: Not applicable
Marine Pollutant: Yes**Sea**

Refer to IMDG regulations.

Limited Quantity

**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****WHMIS 1988 Classification**B2 – Flammable Aerosol; A – Aerosol Container
D2B – Toxic Material (Skin Irritation)**Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)**

All hazardous ingredients are listed on the DSL/NDSL.

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PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL**Industry and Science Canada**

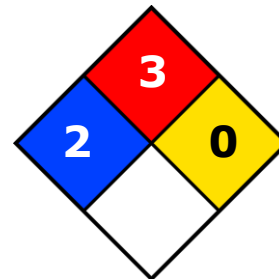
MG Labels products intended for the workplace to conform to WHMIS labeling regulations. Product identification, net quantity declaration, minimum printing type size heights, and packaging of this product are in compliance.

Health Canada

Products produced by MG Chemicals intended for retail display conform to the Canadian Consumer Labeling Regulations.

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 = 5000 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, Sept 2, 2011 revision, USA).

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

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PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL**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	26 February 2016
Supersedes	Not applicable
Reason for Changes:	New product.

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)
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

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Quality System Certified to ISO 9001:2008

SAI Global File #004008
Burlington, Ontario, Canada

PREMIUM POLYURETHANE CONFORMAL COATING 4223F-AEROSOL

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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