

SUPER HFE™ ELECTRONICS CLEANER

4120-450G

# Safety Data Sheet

## Section 1: Identification

### Product Identifier and Other Means of Identification

**Product Identifier:** Super HFE™ Electronics Cleaner (Aerosol)**Other Means of Identification:** Super HFE™ Nettoyant pour Électroniques (Aérosol)**Related Part #** 4120-450G

### Recommended Use and Restriction on Use

**Use:** Aerosol cleaner for printed circuit boards**Uses Advised Against:** Do not use on live circuits

### Details of Manufacturer or Importer

**Manufacturer**MG Chemicals  
1210 Corporate Drive  
Burlington, Ontario L7L 5R6  
CANADAMG Chemicals (Head Office)  
9347-193 Street  
Surrey, British Columbia V4N 4E7  
CANADA**TEL** +1-800-340-0772**TEL** +1-905-331-1396**FAX** +1-800-340-0773**FAX** +1-905-331-2682**E-MAIL** [support@mgchemicals.com](mailto:support@mgchemicals.com)**E-MAIL** [info@mgchemicals.com](mailto:info@mgchemicals.com)**WEB** [www.mgchemicals.com](http://www.mgchemicals.com)**E-MAIL** (Competent Person): [sds@mgchemicals.com](mailto: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

**SUPER HFE™ ELECTRONICS CLEANER**
**4120-450G**
**Section 2: Hazard(s) Identification**
**Classification of Hazardous Chemical**
**GHS Categories**

Criteria	Category	Signal Word	Pictograms
Gas Under Pressure	Liquefied gas	Warning	Gas Cylinder
Acute Toxicity Oral	4	Warning	Exclamation
Eye Irritation	2	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	<b>WARNING</b>
Pictograms	Hazard Statements
	H280: Contains gas under pressure; may explode if heated
	H319: Causes serious eye irritation H302: Harmful if swallowed
<i>No symbol mandated</i>	H412: Harmful to aquatic life with long lasting effects

*Section continued on the next page*

**SUPER HFE™ ELECTRONICS CLEANER****4120-450G***Continued*

<b>Prevention</b>	<b>Precautionary Statements</b>
P102	Keep out of reach of children.
P270	Do not eat, drink, or smoke when using this product.
P210	Keep away from heat, hot surfaces, sparks, open flames and other source of ignition. No smoking.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P280	Wear eye protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
<b>Response</b>	<b>Precautionary Statements</b>
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 attention.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P330	Rinse mouth.
<b>Storage</b>	<b>Precautionary Statements</b>
P403	Store in a well-ventilated place.
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].
<b>Disposal</b>	<b>Precautionary Statements</b>
P501	Dispose of contents and container in accordance to local, regional, and international regulations.

*Section continued on the next page*

**SUPER HFE™ ELECTRONICS CLEANER**
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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
Weathering	The liquid mixture is non-flammable as is, but the liquid may become flammable during evaporation due to uneven weathering (unequal evaporation rates of non-flammable and flammable components).	None	None

**Section 3: Composition/Information on Ingredients**

CAS #	Chemical Name	%(weight)
156-60-5	1,2-trans-dichloroethylene	36%
811-97-2	1,1,1,2-tetrafluoroethane	30%
406-58-6	1,1,1,3,3-pentafluorobutane	28%
163702-07-6	methyl nonafluorobutyl ether	4%
163702-08-7	methyl nonafluoroisobutyl ether	4%
71-36-3	1-butanol	2%

**Section 4: First-Aid Measures**

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
<b>IF IN EYES</b>	P305 + P351 + P338, P337 + P313
<b>Immediate Symptoms</b>	<i>irritation, redness, pain</i>
<b>Response</b>	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.

*Section continued on the next page*

**SUPER HFE™ ELECTRONICS CLEANER****4120-450G**

<b>IF SWALLOWED</b>	P301 + P312, P330, P331
<b>Immediate Symptoms</b>	<i>nausea, drowsiness, fatigue</i>
<b>Response</b>	Rinse mouth. Do NOT induce vomiting. If you feel unwell: Call a POISON CENTER/doctor.
<b>IF ON SKIN</b>	P302 + P364
<b>Immediate Symptoms</b>	<i>low toxicity</i>
<b>Response</b>	Wash with plenty of water.
<b>IF INHALED</b>	P304 + P340
<b>Immediate Symptoms</b>	<i>low toxicity</i>
<b>Response</b>	Remove person to fresh air and keep comfortable for breathing.

**Section 5: Fire-Fighting Measures**

<b>Extinguishing Media</b>	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish. Use water spray to cool containers.
<b>Specific Hazards</b>	The spray liquid may ignite during evaporation due fractional evaporation, which is caused by the different evaporation rates of the ignitable and non-ignitable components.
<b>Combustion Products</b>	Produces carbon oxides (CO,CO <sub>2</sub> ), and may produce hydrogen fluorides (HF), hydrogen chlorides (HCl), fluorophosgene, and perfluoroisobutylene (PFIB)
<b>Fire-Fighter</b>	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

**SUPER HFE™ ELECTRONICS CLEANER****4120-450G****Section 6: Accidental Release Measures**

<b>Personal Protection</b>	Use personal protection recommended in Section 8.
<b>Precautions for Response</b>	Keep away from extreme heat or open flames.
<b>Environmental Precautions</b>	Avoid release to the environment.
<b>Containment</b>	Not applicable
<b>Cleaning</b>	Collect liquid in a sealable, chemical-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wipe with a paper towel.
<b>Disposal</b>	Dispose of spill waste according to Section 13.

**Section 7: Handling and Storage**

<b>Prevention</b>	Keep out of reach of children. Keep away from heat, hot surfaces, sparks, open flames and other source of ignition. No smoking. Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F]. Do not eat, drink, or smoke when using this product.
<b>Handling</b>	Wear eye protection. Wash hands thoroughly after handling. Avoid release to the environment.
<b>Storage</b>	Store in a well-ventilated area. Keep cool. Keep container tightly closed.

**SUPER HFE™ ELECTRONICS CLEANER**
**4120-450G**
**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)
1,2-trans-dichloroethylene	ACGIH	200 ppm	Not established
	U.S.A. OSHA PEL	200 ppm	Not established
	Canada AB	200 ppm	Not established
	Canada BC	200 ppm	Not established
	Canada ON	200 ppm	250 ppm
	Canada QC	200 ppm	Not established
1,1,1,2-tetrafluoroethane	MG Chemicals <sup>a)</sup>	1 000	Not established
Methyl nonafluorobutyl ether	AIHA <sup>b)</sup>	750 ppm	Not established
Methyl nonafluoroisobutyl ether	AIHA <sup>b)</sup>	750 ppm	Not established
1-butanol	ACGIH	20 ppm	Not established
	U.S.A. OSHA PEL	100 ppm	Not established
	Canada AB	20 ppm	Not established
	Canada BC	15 ppm	30 ppm (Ceiling)
	Canada ON	20 ppm	Not established
	Canada QC	50 ppm (Ceiling)	Not established

*Note:* Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH<sup>1</sup>, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS database<sup>2</sup> 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) MG Chemicals limit based on prevalent international exposure limits

b) AIHA = American Industrial Hygiene Association

**Engineering Controls**
**Ventilation**

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

**SUPER HFE™ ELECTRONICS CLEANER****4120-450G****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 incidental exposure, you may use nitrile 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.



**SUPER HFE™ ELECTRONICS CLEANER**
**4120-450G**
**Section 9: Physical and Chemical Properties**

<b>Physical State</b>	Liquid	<b>Lower Flammability Limit</b>	Not available
<b>Appearance</b>	Colorless	<b>Upper Flammability Limit</b>	Not available
<b>Odor</b>	Slight ethereal	<b>Vapor Pressure<sup>c)</sup> @20 °C</b>	270 mmHg [>36 kPa]
<b>Odor Threshold</b>	Not available	<b>Vapor Density</b>	>3 (Air =1)
<b>pH</b>	Not available	<b>Relative Density @25 °C</b>	1.27
<b>Freezing/Melting Point</b>	Not available	<b>Solubility in Water</b>	Slightly miscible
<b>Initial Boiling Point<sup>a)</sup></b>	≥40 °C [104 °F]	<b>Partition Coefficient n-octanol/water</b>	Not available
<b>Flash Point<sup>b)</sup></b>	None detected	<b>Auto-ignition Temperature<sup>d)</sup></b>	≥405 °C [≥761 °F]
<b>Evaporation Rate</b>	Not available	<b>Decomposition Temperature</b>	Not available
<b>Flammability</b>	Non flammable	<b>Viscosity @40 °C</b>	<20.5 mm <sup>2</sup> /s

a) Lowest component literature value, which corresponds to 1,1,1,3,3-pentafluorobutane

b) No flash point was detected on non-weathered mixture; however, the liquid does readily ignite with weathering.

c) Calculated using Raoult's Law and LeChatelier Principle

d) Lowest component auto-ignition literature value

**Section 10: Stability and Reactivity**

<b>Reactivity</b>	Not available.
<b>Chemical Stability</b>	Chemically stable at normal temperatures and pressures.
<b>Conditions to Avoid</b>	Temperatures above 50 °C [122 °F], open flames, and incompatible substances
<b>Incompatibilities</b>	oxidizing agents, strong acids, strong bases, alkali metals
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

**SUPER HFE™ ELECTRONICS CLEANER**
**4120-450G**
**Section 11: Toxicological Information**
**Summary of Effects and Symptoms by Routes of Exposure**

<b>Eyes</b>	Causes redness, serious eye irritation, and pain.
<b>Skin</b>	May cause mild skin irritation.
<b>Inhalation</b>	Low toxicity
<b>Ingestion</b>	Low toxicity: nausea, drowsiness, fatigue
<b>Chronic</b>	Repeated exposure may cause skin dryness or cracking.

**Acute Toxicity (Lethal Exposure Concentrations)**

<b>Chemical Name</b>	<b>LD50 oral</b>	<b>LD50 dermal</b>	<b>LC50 inhalation</b>
1,2-trans-dichloroethylene	1 235 mg/kg Rat	>5 g/kg Rabbit	24 100 ppm 4 h Rat
1,1,1,2-tetrafluoroethane	Not available	Not available	1 500 g/m <sup>3</sup> 4 h Rat
1,1,1,3,3-pentafluorobutane	>2 000 mg/kg Rat <sup>a)</sup>	Not available	Not available
methyl nonafluorobutyl ether	>5 g/kg Rat <sup>a)</sup>	Not available	>100 000 ppm Rat 4 h <sup>a)</sup>
methyl nonafluoroisobutyl ether	>5 g/kg Rat <sup>a)</sup>	Not available	>100 000 ppm Rat 4 h <sup>a)</sup>
1-butanol	790 mg/kg Rat	3 400 mg/kg Rabbit	Not available

*Note:* Toxicity data from the RTECS<sup>2</sup> and ECHA databases were consulted. The data from supplier SDS were also consulted.

a) Value from supplier safety data sheet

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**SUPER HFE™ ELECTRONICS CLEANER****4120-450G****Other Toxicological Effects**

<b>Skin corrosion/irritation</b>	Based on available data, the classification criteria are not met.
<b>Serious eye damage/irritation</b>	The 1-butanol component is expected to cause serious eye irritation at a concentration of 2%.
<b>Sensitization</b> (allergic reactions)	Based on available data, the classification criteria are not met.
<b>Carcinogenicity</b> (risk of cancer)	None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP
<b>Mutagenicity</b> (risk of heritable genetic effects)	Based on available data, the classification criteria are not met.
<b>Reproductive Toxicity</b> (risk to sex functions)	Based on available data, the classification criteria are not met.
<b>Teratogenicity</b> (risk of fetus malformation)	Based on available data, the classification criteria are not met.
<b>STOT-single exposure</b>	Based on available data, the classification criteria are not met.
<b>STOT-repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met. There are no 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.

The 1,2-trans-dichloroethylene ingredient is categorized to be a chronic category 3 environmental toxicant in Annex VI (Table 3.1). According to an EPA report, it has with minimal LC50 of 135 mg/L for *Lepomis macrochirus* (bluegill fish); EC50 220 mg/L 48 h *Daphnia magna* (water flea).

The methyl nonafluorobutyl ether and methyl nonafluoroisobutyl ether ingredients are considered to be practically non-toxic. These ingredients are not readily biodegradable. Their lowest LC50, EC50, or IC50 for aquatic organisms are greater than the substances water solubility, and the high volatility and means it should move to the atmosphere rapidly. The atmospheric lifetime is about 4.1 years.

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**SUPER HFE™ ELECTRONICS CLEANER****4120-450G**

The 1,1,1,3,3-pentafluorobutane and 1-butanol are not classifiable as an environmental toxicant with minimal LC50 of >200 mg/L.

**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 available

**Other Effects**

Global Warming Potential (GWP)

<b>Ingredients</b>	<b>GWP</b>
1,2-trans-dichloroethylene	negligible
1,1,1,2-tetrafluoroethane	1 430
1,1,1,3,3-pentafluorobutane	890
methyl nonafluorobutyl ether	280
methyl nonafluoroisobutyl ether	280

Note: GWP 100 year (reference to CO<sub>2</sub> GWP =1).

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

VOC with low vapor pressure exemption = 70%

\*VOC = Volatile Organic Content

**Section 13: Disposal Information**

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

**SUPER HFE™ ELECTRONICS CLEANER**

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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 L and under  
**Limited Quantity**



**Air**

**Refer to ICAO-IATA Dangerous Goods Regulations.**

Sizes 1 L and under  
**Limited Quantity**  
Max Net Qty/Pkg =  
30 kg gross



**UN number:** UN1950  
**Shipping Name:** AEROSOLS, non-flammable  
**Class:** 2.1  
**Packing Group:** Not applicable  
**Marine Pollutant:** No

**Sea**

**Refer to IMDG regulations.**

Sizes 1 L and under  
**Limited Quantity**



**UN number:** UN1950  
**Shipping Name:** AEROSOLS  
**Class:** 2.1  
**Packing Group:** Not applicable  
**Marine Pollutant:** No

**Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.**

**SUPER HFE™ ELECTRONICS CLEANER**

**4120-450G**

**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.

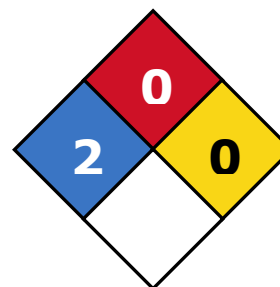
**USA**

**Other Classifications**

**HMIS® RATING**

<b>HEALTH:</b>	* 2
<b>FLAMMABILITY:</b>	0
<b>PHYSICAL HAZARD:</b>	0
<b>PERSONAL PROTECTION:</b>	

**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.

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

This product contains 1,2-trans-dichloroethylene (CAS# 156-60-5; reportable quantity = 1 000 lb) and 1-butanol (CAS# 71-36-3; reportable quantity = 5 000 lb), which can be subject to the CERCLA reporting requirements.

**TSCA** (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

**California Proposition 65** (Chemicals known to cause cancer or reproductive toxicity).

This product does not contain any listed substances in California.

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**SUPER HFE™ ELECTRONICS CLEANER****4120-450G****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**

<b>Prepared by the</b>	Regulatory Affairs Department
<b>Date of Review</b>	05 March 2020
<b>Supersedes</b>	05 October 2018
<b>Reason for Changes:</b>	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
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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**SUPER HFE™ ELECTRONICS CLEANER****4120-450G**

**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](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto:support@mgchemicals.com)

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