

HFE SUPER CLEANER DEGREASER

4120-450G

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: HFE Super Cleaner Degreaser**SDS Code:** 4120-Aerosol**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

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 CHEMTREC ☎: **+1-800-424-9300****For emergencies involving dangerous goods;** Collect 24/7CANADA: Call CANUTEC ☎: **+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
Gas under pressure	Liquefied gas	Liquefied gas	Warning	Gas Cylinder
Acute Toxicity	Oral	4	Warning	Exclamation
Eye Irritation		2	Warning	Exclamation
Environmental Hazard	Chronic Aqua. Tox.	3	none	none

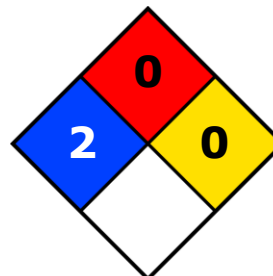
Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

Other Classifications

HMIS® RATING

HEALTH:	2
FLAMMABILITY:	0
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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Label Elements

Signal Word	WARNING
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
Prevention	Precautionary Statements
P102	Keep out of reach of children.
P270	Do not eat, drink, or smoke when using this product.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/eye protection/face protection.
P273	Avoid release to the environment.
Response	Precautionary Statements
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/doctor if you feel unwell.
P330	Rinse mouth.
Storage	Precautionary Statements
P410 + P412 + P403	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F]. Store in well ventilated place.
Disposal	Precautionary Statements
P501	Dispose of contents/container in accordance to local/regional/international regulations.

Note: Contains 63% flammable ingredients mixed with flammable inhibiting components.

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Hazards Not Otherwise Classified

The liquid content is non-flammable as mixed, but the liquid can become flammable during the evaporation due to weathering (unequal evaporation rates of non-flammable and flammable components).

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	Wt%
156-60-5	1,2-trans-dichloroethylene	30-35%
811-97-2	1,1,1,2-tetrafluoroethane	30-35%
406-58-6	1,1,1,3,3-pentafluorobutane	24-28%
163702-07-6	methyl nonafluorobutyl ether	1-4%
163702-08-7	methyl nonafluoroisobutyl ether	1-4%
71-36-3	1-butanol	1-2%

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	<i>irritation, redness, pain</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, P312
Immediate Symptoms	<i>nausea, drowsiness, fatigue</i>
Response	Rinse mouth. Do NOT induce vomiting. If you feel unwell: Call a POISON CENTER/doctor.
IF ON SKIN (or hair)	P302 + P364
Immediate Symptoms	<i>None known</i>
Response	IF ON SKIN: Wash with plenty of water.
IF INHALED	P304 + P340
Immediate Symptoms	<i>None known</i>
Response	Remove person to fresh air (out of the contaminated zone) and keep comfortable for breathing.

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Section 5: Fire-Fighting Measures

Auto-ignition Temperature ^{a)}	≥405 °C [761 °F]	Flash Point ^{b)}	None detected	LFL [LEL] ^{c)}	Not available
				UFL [UEL]	

In case of fire P370 + P378

Extinguishing Media Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.

Specific Hazards Liquid may ignite during evaporation due fractional evaporation which causes ignitable and non-ignitable components to evaporate at different rates.

Combustion Products Produces carbon oxides (CO,CO₂), and may produce hydrogen fluorides (HF), hydrogen chlorides (HCl), fluorophosgene, and perfluoroisobutylene (PFIB)

Fire-Fighter Wear self-contained breathing apparatus for fire fighting

- a) Values based on, which is the component with the lowest auto-ignition value.
- b) No flash point was detected on non-weathered mixture; however, the liquid does readily ignite with weathering.
- c) LFL = Lower Flammability [or Explosion] Limit (in volume %);
UFL = Upper Flammability [or Explosion] Limit (in volume %)

Section 6: Accidental Release Measures

Personal Protection Use personal protection recommended in Section 8.

Precautions for Response Avoid breathing the mist/spray/vapors. Keep away from extreme heat or open flames.

Environmental Precautions Avoid release to the environment.

Containment Contain with inert absorbent (such as soil, sand, vermiculite).

Cleaning 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 Dispose of spill waste according to Section 13.

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Section 7: Handling and Storage

- Prevention** Keep out of reach of children.
Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F]. Store in well ventilated place.
Keep away from heat/sparks/open flames/hot surfaces.
Do not eat, drink, or smoke when using this product.
- Handling** Wear protective gloves/clothing/eye protection.
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.

Section 8: Exposure Controls/Personal Protection

Routes of Entry

Eyes, ingestion, inhalation, and skin

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 ^{a)}	1,000	Not established
Methyl nonafluorobutyl ether	AIHA ^{b)}	750 ppm	Not established
Methyl nonafluoroisobutyl ether	AIHA ^{b)}	750 ppm	Not established

a) MG Chemicals limit based on prevalent international exposure limits

b) AIHA = American Industrial Hygiene Association

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Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1-butanol	ACGIH	20 ppm	Not established
	U.S.A. OSHA PEL	100 ppm	300 ppm
	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 ACGIH², OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database¹ of the Canadian Centre for Occupational Health and Safety (CCOHS) a 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.

Engineering Controls

Ventilation Keep airborne concentrations below exposure limits.

Personal Protective Equipment

Eye protection Wear appropriate protective eyeglasses or chemical safety goggles.

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

Skin Protection Use of protective gloves chemically resistant gloves if skin contact is likely.

For incidental exposure, you may use nitrile gloves.

Respiratory Protection If exposed to vapors above the exposure limit, wear respirator such as a half-mask respirator with organic vapor cartridge.

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.

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Section 9: Physical and Chemical Properties

Physical State	Liquid	Lower Flammability Limit	Not available
Appearance	Colorless	Upper Flammability Limit	Not available
Odor	Slight ethereal	Vapor Pressure^{c)} @20 °C	270 mmHg [>36 kPa]
Odor Threshold	Not available	Vapor Density	>3 (Air =1)
pH	Not available	Specific Gravity @25 °C	1.27
Freezing/Melting Point	Not available	Solubility in Water	Slightly soluble
Boiling Point^{a)}	≥40 °C [104 °F]	Partition Coefficient	Not available
Flash Point^{b)}	None detected	Auto-ignition Temperature^{d)}	≥405 °C [≥761 °F]
Evaporation Rate	>1 (ButAc =1)	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	Viscosity @40 °C	<<20.5 mm ² /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

Reactivity	Not available.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Temperatures above 50 °C [122 °F]), open flames, and incompatible substances
Incompatibilities	oxidizing agents, strong acids, strong bases, alkali metals
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

Routes of Exposure

Eyes, ingestion, inhalation, and skin

Symptoms Summary

- Eyes** Causes severe eye irritation if splashed in eyes or exposed to vapors. May also cause eye redness or pain.
- Skin** May causes mild skin irritation
- Inhalation** No known symptoms
- Ingestion** nausea, drowsiness, fatigue
- Chronic** No known effects

Acute Toxicity (Lethal Exposure Concentrations)

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

Note: Representative toxicity data from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS)² data from supplier (M)SDS were also consulted.

a) Value from supplier safety data sheet

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Skin corrosion/irritation	No known effects
Serious eye damage/irritation	The 1-butanol component is expected to cause serious eye irritation at a concentration of 2%.
Sensitization (allergic reactions)	No sensitization effects known
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)	No effects known
Reproductive Toxicity (risk to sex functions)	No effects known
Teratogenicity (risk of fetus malformation)	No effects known
STOT-single exposure	No effects known
STOT-repeated exposure	No effects known
Aspiration hazard	Not an aspiration hazard under GHS. Does not contain any components classified as Cat 1 aspiration hazards.

Section 12: Ecological Information

The IMDG Code criteria and the raw-material (M)SDS along with supporting data for the classification of registered substances from the European Chemical Agency database (<http://echa.europa.eu>) were used.

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.

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

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HFE SUPER CLEANER DEGREASER**4120-450G****Acute Ecotoxicity**

Category 3

GHS Code: Hazard Statement

H402: Harmful to aquatic life

P273: Avoid release to the environment

Chronic Ecotoxicity

Category 3

GHS Code: Hazard Statement

H412: Harmful to aquatic life with long lasting effects

P273: Avoid release to the environment

Biodegradability

Not available

Other Effects

Global Warming Potential (GWP)

Ingredients	GWP
1,2-trans-dichloroethylene	negligible
1,1,1,2-tetrafluoroethane	1 200
1,1,1,3,3-pentafluorobutane	890
methyl nonafluorobutyl ether	280
methyl nonafluoroisobutyl ether	280

Note: 100 year ITH (reference to CO₂ GWP =1).

VOC (EPA, WHIMS, and Europe) = 73% [692 g/L]

VOC = Volatile Organic Content*Section 13: Disposal Information**

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

HFE SUPER CLEANER DEGREASER**4120-450G****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

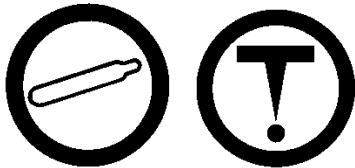
Limited Quantity**UN number:** UN1950**Shipping Name:** AEROSOLS, non-flammable**Class:** 2.2**Packing Group:** Not applicable**Marine Pollutant:** No**Air****Refer to ICAO-IATA Dangerous Goods Regulations.**

Sizes up to 30 kg Gross

Limited Quantity**UN number:** UN1950**Shipping Name:** AEROSOLS, non-flammable**Class:** 2.2**Packing Group:** Not applicable**Marine Pollutant:** No**Sea****Refer to IMDG regulations.**

Sizes 1 kg and under

Limited Quantity**UN number:** UN1950**Shipping Name:** AEROSOLS**Class:** 2.2**Packing Group:** Not applicable**Marine Pollutant:** No**Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.**

HFE SUPER CLEANER DEGREASER**4120-450G****Section 15: Regulatory Information****Canada****WHMIS Classification**

A – Aerosol Container; D2B Toxic Other (eye irritant)

Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)

All hazardous ingredients are listed on the DSL/NDSL.

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**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 contains toluene that is listed as hazardous air pollutants.

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

This product does not contain ingredients that 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 listed substances in California.

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HFE SUPER CLEANER DEGREASER**4120-450G****Europe****RoHS**

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, or PBDE's, and complies with European RoHS regulations.

WEEE

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 12 August 2014
Supersedes 16 October 2013
Reason for Changes: Change to HCS 2012 format.

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

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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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