Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: 403C

Other Means of Identification: Super Cold™ 1234ZE

Related Part # 403C-235G

Recommended Use and Restriction on Use

Use: For cooling electronic components and locating thermal intermittents

Uses Advised Against: Not available

Details of Manufacturer or Importer

Manufacturer

MG Chemicals
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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

Section 2: Hazard(s) Identification

Classification of Hazardous Chemical

GHS Categories

Criteria	Category	Signal Word	Pictograms
Gas Under Pressure	Liquefied Gas	Warning	Gas Cylinder

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**
	H280: Contains gas under pressure; may explode if heated
Prevention	**Precautionary Statements**
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No Smoking.
P251	Do not pierce or burn, even after use.
Storage	**Precautionary Statements**
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].

Section continued on the next page

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Simple Asphyxiants	May displace oxygen and cause rapid suffocation.	Warning	none
Frostbite	The jet or liquid may cause frostbite in contact with skin or eyes.	Warning	none
Inhalation overexposure	Inhalation overexposure following an intentional abuse or use in confined space may cause cardiac or central nervous systems effects	none	none

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
29118-24-9	trans-1,3,3,3-tetrafluoroprop-1-ene [a)]	100%

a) Also known as HFO-1234ze

Section 4: First-Aid Measures

Exposure Condition	*GHS Code/Symptoms/Precautionary Statements*
IF INHALED	P304 + P340, P312
Immediate Symptoms	*low toxicity: for severe overexposure can cause dizziness and drowsiness*
Response	Remove person to fresh air and keep comfortable for breathing. If you feel unwell: Call a POISON CENTRE or doctor.
IF IN EYES	P305 + P351 + P338, P336 + P315
Immediate Symptoms	*frostbite, cold burns*
Response	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If frostbite occurs: Thaw frosted parts with lukewarm water. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Section continued on the next page

IF ON SKIN	P302 + P352, P336 + P315
Immediate Symptoms	*frostbite, cold burns*
Response	IF ON SKIN: Wash with plenty of water. If frostbite occurs: Thaw frosted parts with lukewarm water. Do not use hot water. Do not rub affected area. Get immediate medical attention.
IF SWALLOWED	P301 + P330, P336 + P315
Immediate Symptoms	*frostbite (mouth)*
Response	IF SWALLOWED: Rinse mouth. If frostbite occurs: Thaw frosted parts with lukewarm water. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Medical Advice

Avoid giving catecholoamine drugs (such as epinephrine) due to possible cardiac disturbance. Treat symptomatically.

Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use extinguishing media suitable for surrounding materials. Use water spray to cool containers.
Specific Hazards	Aerosols containers may erupt with force at temperatures above 50 °C [122 °F]. Produces irritating and toxic fumes in fires or in contact with hot surfaces. The vapors are heavier than air and may displace oxygen in low-lying areas creating a suffocation hazard.
Combustion Products	Produces carbon oxides (CO,CO_2), halogenated compounds, and hydrogen fluorides.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	See personal protection recommendations in Section 8. For very large spills, wear self-contained breathing apparatus before approaching the spill. Wear cold-insulating clothing and gloves.
Precautions for Response	For aerosol can spills in confined or low lying space, leave the immediate spill area. If it can safely be done, extinguish open flames or remove high temperature sources to avoid producing toxic decomposition products.
Environmental Precautions	Not required under normal use.
Containment Methods	Not applicable
Cleaning Methods	For aerosol can spills at room temperature, the product turns gaseous and disperses in atmosphere. Ensure adequate ventilation, especially in low or enclosed areas.
Disposal Methods	Dispose of spill waste according to Section 13.

Section 7: Handling and Storage

Prevention	Keep out of reach of children. Avoid direct skin or eye contact with liquid or aerosol jet. Avoid breathing gas or spray. In cases of inadequate ventilation wear respiratory protection. Do not pierce or burn, even after use.
Handling	Wear cold-insulating gloves if exposure to liquid or aerosol jet is likely. Wear eye protection.
Storage	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].

Section 8: Exposure Controls/Personal Protection

Substances with Occupational Exposure Limit Values

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
trans-1,3,3,3-tetrafluoroprop-1-ene	*MG Chemicals* [a)] ACGIH U.S.A. OSHA PEL USA AIHA WEEL Canada	800 ppm Not established Not established 800 ppm Not established	Not established Not established Not established Not established Not established

Note: The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database[2] 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 recommended limit corresponding to prevalent international threshold values

Engineering Controls

Ventilation

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

General ventilation is adequate for normal use; keep overall exposure as low as possible.

Personal Protective Equipment

Eye protection

Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Ensure that glasses have side shields for lateral protection.

Skin Protection

If exposure to the jet or liquid is likely, wear cold-insulating gloves to protect the skin against frostbites.

Respiratory Protection

For extreme exposures, use self-contained breathing apparatus or supplied by air.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquified gas, in aerosol format	**Lower Flammability Limit**	Not applicable
Appearance	Colorless	**Upper Flammability Limit**	Not applicable
Odor	Slight, ether-like	**Vapor Pressure @25 °C**	419 kPa [3 140 mmHg]
Odor Threshold	Not available	**Vapor Density**	3.94 (Air =1)
pH	Not Available	**Relative Density @21.1 °C**	1.17
Freezing/Melting Point	-156 °C [-249 °F]	**Solubility in Water @21.1 °C**	0.373 g/L
Initial Boiling Point a)	-19 °C [-2.2 °F]	**Partition Coefficient n-octanol/water**	1.6 a)
Flash Point	None detected	**Auto-ignition Temperature**	368 °C [695 °F]
Evaporation Rate	≥1 (Ether = 1)	**Decomposition Temperature**	Not available
Flammability	Non Flammable	**Viscosity @40 °C**	Not available

Note: Literature values are used.
a) Octanol-water LogP 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	Strong oxidizing agents, alkali metals
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

Section 11: Toxicological Information

Summary of Effects and Symptoms by Routes of Exposure

Eyes See skin symptoms.

Skin Contact with the liquid may cause frostbite due to heat lost caused by rapid evaporation. Exposure to the jet can lead to frostbite.

Inhalation Extreme exposure may cause central nervous system depression and irregular heart beat.

Ingestion See inhalation and skin symptoms.

Chronic No chronic effects known.

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
trans-1,3,3,3-tetrafluoroprop-1-ene	Not available	Not available	>207 000 ppm 4 h Rat

Note: Toxicity data from the RTECS[2] and ECHA databases were consulted. The data from supplier SDS were also consulted.

Other Toxicological Effects

Skin corrosion/irritation Based on available data, the classification criteria are not met.

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) 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. No mutagenic effects observed in four tests.

Reproductive Toxicity (risk to sex functions) Based on available data, the classification criteria are not met.

Section continued on the next page

Teratogenicity (risk of fetus malformation)	Based on available data, the classification criteria are not met.
STOT-single exposure	Based on available data, the classification criteria are not met. Can affect the central nervous system and cardiovascular systems by inhalation at extreme doses that do not give rise to classification.
STOT-repeated exposure	Based on available data, the classification criteria are not met. The chronic no observed effect level is 10 000 ppm.
Aspiration hazard	Based on available data, the classification criteria are not met. The liquid content is not classifiable as an aspiration hazard of category 1 or 2.

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 trans-1,3,3,3-tetrafluoroprop-1-ene substance is not classifiable as an environmental toxicant.

Acute Ecotoxicity

Based on available data, the classification criteria are not met.

Chronic Ecotoxicity

Based on available data, the classification criteria are not met.

Biodegradability

No data available

Other Effects

Global Warming Potential

The 100 years global warming potential is <1.

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

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) **Regulations.**

Limited Quantity 	

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Limited Quantity 	**UN number**: UN1950 **Shipping Name:** AEROSOLS, non-flammable **Class:** 2.2 **Packing Group**: Not applicable **Marine Pollutant:** No

Note: Avoid shipping by air if possible.

Sea

Refer to IMDG Regulations.

Limited Quantity 	**UN number**: UN1950 **Shipping Name:** AEROSOLS, non-flammable **Class:** 2.2 **Packing Group**: Not applicable **Marine Pollutant:** No

Note: **Shipper must be appropriately <u>trained and certified</u> 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.

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

HEALTH:	* 1
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)

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 does not contain substances which are 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.

Section continued on the next page

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, USA)

This product does not contain any of the listed substances.

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 the	MG Chemicals Regulatory Department
Date of Revision	26 February 2020
Supersedes	08 March 2018

Reason for Changes: Update to the emergency contact 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®)

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Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
ECHA	European Chemicals Agency
EU	European Union
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
IARC	International Agency for Research on Cancer
NOELR	No observable effect loading ratio
NTP	National Toxicology Program
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
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

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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