



MATERIAL SAFETY DATA SHEET

PRODUCT NAME: HALOCARBON 23

1. Chemical Product and Company Identification

BOC Gases,
Division of,
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE
NUMBER: CHEMTREC (800) 424-9300

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE
NUMBER: (905) 501-0802
EMERGENCY RESPONSE PLAN NO: 2-0101

PRODUCT NAME: HALOCARBON 23
CHEMICAL NAME: Trifluoromethane
COMMON NAMES/SYNONYMS: Fluoroform, Freon ® 23, Trifluoromethane
TDG (Canada) CLASSIFICATION: 2.2
WHMIS CLASSIFICATION: A, D2B

PREPARED BY: Loss Control (908)464-8100/(905)501-1700.
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/1/99

2. Composition, Information on Ingredients

EXPOSURE LIMITS¹:

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Trifluoromethane FORMULA: CHF ₃ CAS: 75-46-7 RTECS #: PB6900000	100.0	None Established	None Established	Not Available

¹ As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

² Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.

³ As stated in the ACGIH 1998-1999 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

3. Hazards Identification

EMERGENCY OVERVIEW

Colorless gas with slight ethereal odor. This product does not contain oxygen and may cause asphyxia if released in a confined area. Fluorocarbons can cause irritation, central nervous system depression and irregular heart beat at high concentrations. Contact with liquid may cause frostbite. Nonflammable but decomposes to toxic gases, including hydrofluoric, under fire conditions. Contents under pressure. Use and store below 125 °F.

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ROUTE OF ENTRY:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
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HEALTH EFFECTS:

Exposure Limits No	Irritant Yes	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None Reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:

PERSONS WITH POTENTIAL EXPOSURE SHOULD NOT WEAR CONTACT LENSES. Contact with liquid may cause frostbite and tissue damage.

SKIN EFFECTS:

Contact with the rapidly evaporating liquid may cause frostbite. Frostbite effects appear as a change in color of the skin to grey or white, possibly followed by blistering.

INGESTION EFFECTS:

Ingestion is not likely.

INHALATION EFFECTS:

Product is relatively nontoxic. Fluorocarbons can irritate the eyes, mucous membranes and respiratory system.

Inhalation of high concentrations may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting leading to unconsciousness. At high concentrations narcotic effects may be produced and may cause the heart to beat irregularly and stop.

Oxygen deficiency may occur in the presence of high concentrations resulting in asphyxiation. Maintain oxygen levels above 19.5% at sea level.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Pre-existing heart condition.

NFPA HAZARD CODES

Health: 2
Flammability: 0
Instability: 1

HMS HAZARD CODES

Health: 0
Flammability: 0
Reactivity: 1

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

4. First Aid Measures

EYES:

Never introduce ointment or oil into the eyes without medical advice! For contact of liquid, open eyes wide to allow liquid to evaporate. If pain is present, refer the victim to an ophthalmologist for treatment and follow up.

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SKIN:

Remove contaminated clothing and flush affected areas with lukewarm water. If irritation persists, seek medical attention.

INGESTION:

Unlikely as product is a gas at room temperature.

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Remove victim to fresh air. Administer artificial respiration if breathing has stopped and supplement with oxygen by a trained individual. Further treatment should be symptomatic and supportive. Seek medical attention as soon as possible for follow up treatment. Remove to fresh air. If necessary, give oxygen or provide artificial respiration. Call a physician.

NOTE TO PHYSICIAN: A patient adversely affected by exposure to this product should not be given adrenaline (epinephrine) or similar heart stimulant since these would increase the risk of cardiac arrhythmias.

5. Fire Fighting Measures

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None. Decomposes to toxic gases at fire temperatures		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:

If involved in a fire, product may decompose yielding toxic products, which may include hydrofluoric acid. Cylinder may rupture violently from pressure when involved in a fire situation.

EXTINGUISHING MEDIA:

None required. Use media appropriate for surrounding flammable substances.

FIRE FIGHTING INSTRUCTIONS:

Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear with chemical protective clothing as necessary to prevent exposure to decomposition products. Continue to cool fire-exposed cylinders until well after flames are extinguished.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Product is noncorrosive and may be used with any common structural material. Silver and carbon bearing alloys can act as catalysts for decomposing the product at high temperatures. Alloys containing more than 2% magnesium should not be used if water is present.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<750 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Protect cylinders from physical damage.

Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first-in-first-out" inventory system to prevent full cylinders being stored for excessive periods of time. Handle with reasonable care. Store in a cool, dry place.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

For additional handling recommendations, consult Compressed Gas Association Pamphlet P-1.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS:

Hood with forced ventilation; provide local exhaust to prevent accumulation of **high concentrations**.

EYE/FACE PROTECTION:

Safety glasses for gas. Protective goggles or faceshield for liquid as necessary to prevent contact.

SKIN PROTECTION:

Insulated gloves for handling liquid. Do not use natural rubber.

RESPIRATORY PROTECTION:

A Type C respirator with full-face piece equipped with an escape bottle or a self-contained breathing apparatus should be available for emergency use. Operate this equipment in the positive pressure demand mode.

OTHER/GENERAL PROTECTION:

Safety shoes, safety showers.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure at 70 °F	: 624	psia
Vapor density at 70 °F (Air = 1)	: 2.43	
Evaporation point	: Not available	
Boiling point	: -115.9	°F
	: -82.2	°C
Freezing point	: -247	°F
	: -155	°C
pH	: Not Available	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H2O)	: Slightly	
Odor threshold	: Not Available	
Odor and appearance	: Colorless gas with slight ethereal odor at concentrations greater than 20% by volume.	

10. Stability and Reactivity

STABILITY:

Stable

INCOMPATIBLE MATERIALS:

May react violently with chemically active metals such as sodium, potassium and barium, powdered magnesium, powdered aluminum and organometallics.

HAZARDOUS DECOMPOSITION PRODUCTS:

Decomposes at fire temperatures to hydrofluoric acids and carbonyl fluoride.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. Toxicological Information

No chronic effects data given in the Registry of Toxic Effects of Chemical Substances (RTECS) or Sax, Dangerous Properties of Industrial Materials, 7th ed.

12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

MSDS: G-47

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14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Trifluoromethane or Refrigerant Gas R-23	Trifluoromethane
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1984	UN 1984
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III – SECTION 313 SUPPLIER NOTIFICATION:

This product does not contain toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372.

SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard

Sudden Release of Pressure Hazard

16. Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

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