

# Trifluoromethane $\text{CHF}_3$

Semiconductor Grade: 99.999%



## Description

Halocarbon 23 or Trifluoromethane ( $\text{CHF}_3$ ) is a colorless, odorless, nonflammable liquefied gas that is used in plasma etching of silicon oxide or nitride layers. It may be used in combination with other halocarbons to improve etch rate and uniformity in etching.

Purity Specifications (Maximum Impurity Levels)*	
Contaminant	Semiconductor Grade 99.999% Purity
Oxygen ( $\text{O}_2$ ) & Argon (Ar)	<1.0 ppmv
Nitrogen ( $\text{N}_2$ )	<7.0 ppmv
Methane ( $\text{CH}_4$ )	<0.5 ppmv
Carbon Tetrafluoride ( $\text{CF}_4$ )	<1.0 ppmv
Carbon Dioxide ( $\text{CO}_2$ )	<1.0 ppmv
Nitrous Oxide ( $\text{N}_2\text{O}$ )	<1.0 ppmv
Water ( $\text{H}_2\text{O}$ )	<1.0 ppmv
Other Halocarbons (R-13, R-22, R-115, R-12)	<5.0 ppmv
Acidity as HF	<1.0 ppmv

\*Higher purities are available upon request.

Cylinder Information				
Cylinder Size	Valve Outlet*	Content Lbs/Kg	~Gross Weight Lbs/Kg	Pressure Psig/Bar
2	CGA 660 DISS 716 JIS W22-14L	70/31.8	190/86.4	635/43.8

\*Additional cylinder sizes and/or valve outlets are available upon request.

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## Trifluoromethane CHF<sub>3</sub> (continued)

Physical Constants	
Chemical formula	CHF <sub>3</sub>
Molecular weight	70.0 (g/mol)
Vapor pressure @ STP at +32°F (+0°C) and 1 atm at +60°F (+15.5°C) and 1 atm at +70°F (+21.1°C) and 1 atm at +110°F (+43.3°C) and 1 atm	635 psig, 45.7 atm 347 psig 529 psig 635 psig 1040 psig
Density of the gas at +68°F (+20°C) and 1 atm	0.179lb/ft <sup>3</sup> , kg/m <sup>3</sup>
Specific volume at +70°F (+21.1°C) and 1 atm	5.58 ft <sup>3</sup> /lb, 0.343m <sup>3</sup> /kg
Critical temperature	+78°F, 25.9°C
Critical pressure	702 psia, 48.39 bar
Critical density	20 lb/ft <sup>3</sup> , 322 kg/m <sup>3</sup>

Shipping and Safety Data	
Synonyms	CHF <sub>3</sub> ; Halocarbon 23; Trifluoromethane; R-23; Hydrofluorocarbon 23; HFC23; Fluoroform; Freon 23
CAS Register Number	75-46-7
DOT Classification	Nonflammable gas
DOT Label	Nonflammable gas
Transport Canada Classification	2.2
UN Number	UN 1984
ECCN Number	EAR 99
Harmonized Number	2903.30.2010
Hazards	Suffocation
Toxicity (TLV)	Not Yet Determined
Flammability Range (in air)	Nonflammable gas
Odor	None

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