



# SAFETY DATA SHEET



## Freon™ 95 (R-508B) Refrigerant

Version 7.3      Revision Date: 09/04/2018      SDS Number: 1326665-00037      Date of last issue: 06/20/2018  
Date of first issue: 02/27/2017

### Other hazards

Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.  
Rapid evaporation of the product may cause frostbite.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

#### Components

Chemical name	CAS-No.	Concentration (% w/w)
Perfluoroethane	76-16-4	54
Trifluoromethane*	75-46-7	46

\* Voluntarily-disclosed non-hazardous substance

### SECTION 4. FIRST AID MEASURES

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.
- If inhaled : If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.
- In case of skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area.  
Get medical attention immediately.
- In case of eye contact : Get medical attention immediately.
- If swallowed : Ingestion is not considered a potential route of exposure.
- Most important symptoms and effects, both acute and delayed : May cause cardiac arrhythmia.  
Other symptoms potentially related to misuse or inhalation abuse are  
Cardiac sensitization  
Anaesthetic effects  
Light-headedness  
Dizziness  
confusion  
Lack of coordination  
Drowsiness  
Unconsciousness  
Contact with liquid or refrigerated gas can cause cold burns and frostbite.
- Protection of first-aiders : No special precautions are necessary for first aid responders.
- Notes to physician : Treat symptomatically and supportively.



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- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Avoid breathing gas.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Wear cold insulating gloves/ face shield/ eye protection.  
Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point.  
Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.  
Prevent backflow into the gas tank.  
Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.  
Close valve after each use and when empty. Do NOT change or force fit connections.  
Prevent the intrusion of water into the gas tank.  
Never attempt to lift cylinder by its cap.  
Do not drag, slide or roll cylinders.  
Use a suitable hand truck for cylinder movement.  
Keep away from heat and sources of ignition.  
Take precautionary measures against static discharges.  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Cylinders should be stored upright and firmly secured to prevent falling or being knocked over.  
Separate full containers from empty containers.  
Do not store near combustible materials.  
Avoid area where salt or other corrosive materials are present.  
Keep in properly labeled containers.  
Keep in a cool, well-ventilated place.  
Keep away from direct sunlight.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Self-reactive substances and mixtures  
Organic peroxides  
Oxidizing agents  
Flammable liquids  
Flammable solids  
Pyrophoric liquids  
Pyrophoric solids  
Self-heating substances and mixtures  
Substances and mixtures which in contact with water emit flammable gases  
Explosives  
Acutely toxic substances and mixtures  
Substances and mixtures with chronic toxicity
- Recommended storage temperature : < 126 °F / < 52 °C
- Storage period : > 10 y



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### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquefied gas
Color	:	colorless
Odor	:	slight, ether-like
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	-125.7 °F / -87.6 °C (1,013 hPa)
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Will not burn
Upper explosion limit / Upper flammability limit	:	Upper flammability limit Method: ASTM E681 None.
Lower explosion limit / Lower flammability limit	:	Lower flammability limit Method: ASTM E681 None.
Vapor pressure	:	36,568 hPa (50 °F / 10 °C)
Relative vapor density	:	No data available
Relative density	:	0.76 (50 °F / 10 °C) 1.15 (77 °F / 25 °C)
Density	:	0.943 g/cm <sup>3</sup> (32 °F / 0 °C) (as liquid)
Solubility(ies) Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity Viscosity, kinematic	:	Not applicable

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Explosive properties : Not explosive  
Oxidizing properties : The substance or mixture is not classified as oxidizing.  
Particle size : Not applicable

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### SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.  
Chemical stability : Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.  
Possibility of hazardous reactions : Can react with strong oxidizing agents.  
Conditions to avoid : Heat, flames and sparks.  
Incompatible materials : Oxidizing agents  
Hazardous decomposition products : No hazardous decomposition products are known.

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### SECTION 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

Inhalation  
Skin contact  
Eye contact

#### Acute toxicity

Not classified based on available information.

#### Components:

##### **Perfluoroethane:**

Acute inhalation toxicity : LC50 (Rat): > 500000 ppm  
Exposure time: 4 h  
Test atmosphere: gas  
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 200000 ppm  
Test atmosphere: gas  
Symptoms: Cardiac sensitization

Cardiac sensitisation threshold limit (Dog): 1,129,943.5 mg/m<sup>3</sup>  
Test atmosphere: gas  
Symptoms: Cardiac sensitization

##### **Trifluoromethane:**

Acute inhalation toxicity : LC50 (Rat): > 663000 ppm  
Exposure time: 4 h  
Test atmosphere: gas

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Lowest observed adverse effect concentration (Dog): > 500000 ppm  
Test atmosphere: gas  
Symptoms: Cardiac sensitization

No observed adverse effect concentration (Dog): 500000 ppm  
Test atmosphere: gas  
Symptoms: Cardiac sensitization

Cardiac sensitisation threshold limit (Dog): > 172,414 mg/m<sup>3</sup>  
Test atmosphere: gas  
Symptoms: Cardiac sensitization

### **Skin corrosion/irritation**

Not classified based on available information.

### **Serious eye damage/eye irritation**

Not classified based on available information.

### **Respiratory or skin sensitization**

#### **Skin sensitization**

Not classified based on available information.

#### **Respiratory sensitization**

Not classified based on available information.

### **Germ cell mutagenicity**

Not classified based on available information.

### **Components:**

#### **Perfluoroethane:**

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

#### **Trifluoromethane:**

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

### **Carcinogenicity**

Not classified based on available information.

**IARC** No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

### **Reproductive toxicity**

Not classified based on available information.



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### Components:

#### **Perfluoroethane:**

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

#### **Trifluoromethane:**

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

#### **STOT-single exposure**

Not classified based on available information.

#### **STOT-repeated exposure**

Not classified based on available information.

### Components:

#### **Perfluoroethane:**

Assessment : No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

#### **Trifluoromethane:**

Assessment : No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

#### **Repeated dose toxicity**

### Components:

#### **Perfluoroethane:**

Species : Rat  
NOAEL : 50000 ppm  
LOAEL : >50000 ppm  
Application Route : inhalation (gas)  
Exposure time : 28 d  
Method : OECD Test Guideline 412  
Remarks : No significant adverse effects were reported

#### **Trifluoromethane:**

Species : Rat  
NOAEL : 10000 ppm  
LOAEL : >10000 ppm  
Application Route : inhalation (gas)  
Exposure time : 90 d  
Remarks : No significant adverse effects were reported

#### **Aspiration toxicity**

Not classified based on available information.

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**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****Perfluoroethane:**

- Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 82.3 mg/l  
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 47.4 mg/l  
Exposure time: 48 h
- Toxicity to algae : EC50 (algae): 37.5 mg/l  
Exposure time: 96 h

**Ecotoxicology Assessment**

- Acute aquatic toxicity : Harmful to aquatic life.
- Chronic aquatic toxicity : This product has no known ecotoxicological effects.

**Trifluoromethane:**

- Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 633.26 mg/l  
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 323.05 mg/l  
Exposure time: 48 h
- Toxicity to algae : EC50 (algae): 154.54 mg/l  
Exposure time: 96 h

**Persistence and degradability****Components:****Perfluoroethane:**

- Biodegradability : Result: Not readily biodegradable.

**Trifluoromethane:**

- Biodegradability : Result: Not readily biodegradable.

**Bioaccumulative potential****Components:****Perfluoroethane:**

- Bioaccumulation : Remarks: Bioaccumulation is unlikely.
- Partition coefficient: n-octanol/water : log Pow: 2.15

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### Trifluoromethane:

Bioaccumulation : Bioconcentration factor (BCF): 3.2

Partition coefficient: n-octanol/water : log Pow: 0.84

### Mobility in soil

No data available

### Other adverse effects

#### Product:

Results of PBT and vPvB assessment : This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

#### Components:

##### Perfluoroethane:

Additional ecological information : No data available

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## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal methods

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
Empty pressure vessels should be returned to the supplier.  
If not otherwise specified: Dispose of as unused product.

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## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### UNRTDG

UN number : UN 1078  
Proper shipping name : REFRIGERANT GAS, N.O.S.  
(Perfluoroethane, Trifluoromethane)  
Class : 2.2  
Packing group : Not assigned by regulation  
Labels : 2.2

#### IATA-DGR

UN/ID No. : UN 1078  
Proper shipping name : Refrigerant gas, n.o.s.  
(Perfluoroethane, Trifluoromethane)  
Class : 2.2  
Packing group : Not assigned by regulation  
Labels : Non-flammable, non-toxic Gas

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Packing instruction (cargo aircraft) : 200  
Packing instruction (passenger aircraft) : 200

### IMDG-Code

UN number : UN 1078  
Proper shipping name : REFRIGERANT GAS, N.O.S.  
(Perfluoroethane, Trifluoromethane)  
Class : 2.2  
Packing group : Not assigned by regulation  
Labels : 2.2  
EmS Code : F-C, S-V  
Marine pollutant : no

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

### Domestic regulation

#### 49 CFR

UN/ID/NA number : UN 1078  
Proper shipping name : Refrigerant gases, n.o.s.  
(Perfluoroethane, Trifluoromethane)  
Class : 2.2  
Packing group : Not assigned by regulation  
Labels : NON-FLAMMABLE GAS  
ERG Code : 126  
Marine pollutant : no

### Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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## SECTION 15. REGULATORY INFORMATION

### EPCRA - Emergency Planning and Community Right-to-Know

#### CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

#### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

#### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Gases under pressure  
Simple Asphyxiant

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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### US State Regulations

#### Pennsylvania Right To Know

Perfluoroethane      76-16-4  
Trifluoromethane      75-46-7

#### California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

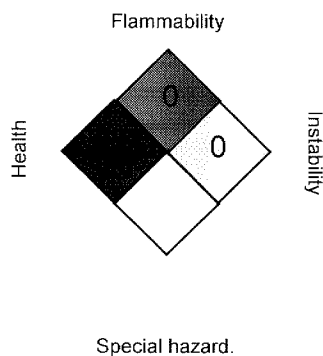
#### California List of Hazardous Substances

Trifluoromethane      75-46-7

### SECTION 16. OTHER INFORMATION

#### Further information

##### NFPA 704:



##### HMIS® IV:

HEALTH	/	0
FLAMMABILITY		0
PHYSICAL HAZARD		3

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "/" represents a chronic hazard, while the "" represents the absence of a chronic hazard.

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Before use read Chemours safety information.

For further information contact the local Chemours office or nominated distributors.

All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

#### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC

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- International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 09/04/2018

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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