

## FC13-4500

### 1,1,2,2-Tetrafluoroethyl-2,2,3,3-Tetrafluoropropyl Ether


Revised 14-November-2016

#### 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product Name</b>	1,1,2,2-Tetrafluoroethyl-2,2,3,3-tetrafluoropropyl ether
<b>Catalog Number</b>	FC13-4500
<b>Supplier</b>	<b>Fluoryx Labs</b> 3650 Research Way, #22 Carson City, NV 89706 USA
<b>Emergency call:</b>	+01-813-248-0585 (International) +1-800-255-3924 (USA)

#### 2. HAZARDS INFORMATION

##### Emergency Overview

<b>OSHA Hazards</b>	Toxic liquid
<b>GHS Classification</b>	Toxic liquid (Category 3)
<b>GHS Label elements, including precautionary statements</b>	
Pictogram	
Signal word	Danger
<b>Hazard statement(s)</b>	
H331	Toxic if inhaled.
<b>Precautionary statement(s)</b>	
P261 P271	Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.
<b>Potential Health Effects</b>	
<b>Inhalation</b>	Toxic by inhalation.
<b>Skin</b>	May cause skin irritation.
<b>Eyes</b>	May cause eye irritation.
<b>Ingestion</b>	May be harmful if swallowed.

#### 3. COMPOSITION AND INFORMATION ON INGREDIENTS

<b>Synonyms</b>	HFE-458; HFE 458pcf-c; Propane,1,1,2,2-tetrafluoro-3-(1,1,2,2-tetrafluoroethoxy)-; Ether,1,1,2,2-tetrafluoroethyl 2,2,3,3-tetrafluoropropyl; 2,2,3,3-Tetrafluoro-1-(1,1,2,2-tetrafluoroethoxy)propane;
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Daikin T-5216;  
1,1,2,2,5,5,6,6-Octafluoro-3-oxahexane

**Chemical formula**

C<sub>5</sub>H<sub>4</sub>F<sub>8</sub>O  
HCF<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>OCF<sub>2</sub>CF<sub>2</sub>H

**Components**

Material	Molecular Weight	CAS #	EINECS #	TSCA
1,1,2,2-Tetrafluoroethyl-2,2,3,3-tetrafluoropropyl ether	232.07	16627-68-2	None	Not listed

**4. FIRST AID MEASURES****General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

Remove casualty from exposure ensuring one's own safety whilst doing so. If conscious, ensure the casualty sits or lies down. If unconscious and breathing is OK, place in the recovery position. If unconscious, check for breathing and apply oxygen. Call a POISON CENTER or doctor/physician.

**In case of skin contact**

Wash off with soap and plenty of water. Transfer to hospital if there are symptoms of poisoning.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**

Rinse the mouth with water. Do not induce vomiting. If conscious, give half a liter of water to drink immediately. If unconscious, check for breathing and apply artificial respiration if necessary. If unconscious and breathing is OK, place in the recovery position. Transfer to hospital as soon as possible.

**5. FIREFIGHTING MEASURES****Suitable extinguishing media**

Suitable extinguishing media for the surrounding fire should be used. Carbon dioxide. Dry chemical powder. Alcohol or polymer foam. Halons. Use water spray to cool containers.

**Special protective equipment for firefighters**

Wear self-contained breathing apparatus for fire fighting. Wear full protective equipment.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions - carbon oxides, hydrogen fluoride, carbonyl fluoride.

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Use personal protective equipment. Avoid inhalation of vapor, mist, dust, or gas. Ensure adequate ventilation. Vapors can accumulate in low areas. Evacuate personnel to safe areas.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

**Methods for cleaning up**

Recover any liquid. Soak up with absorbent material.

Keep in suitable, closed containers for disposal.

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## 7. HANDLING AND STORAGE

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### Precautions for Safe Handling

Avoid contact with the substance. Avoid formation of mist or respirable particles. Provide appropriate exhaust ventilation at places where dust, mist or vapors are formed. Do not handle in a confined space. Normal measures for preventive fire protection.

### Conditions for Safe Storage

Store in dry and cool place. Keep away from heat, sparks and flames. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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Contains no substances with published occupational exposure limit values. However, inhalation exposure should be strictly limited.

### Personal protective equipment

#### Respiratory protection

Use only in a chemical fume hood or local exhaust ventilation, and process enclosure if necessary to control exposure. Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Eye protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin and body protection

Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

#### Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Appearance

Form

Liquid, clear

Color

Colorless

### Safety Data

pH	No data available
Melting Point/Freezing Point	-94 °C
Boiling Point	93 °C @ 760 mm Hg
Flash Point	None (closed cup)
Ignition Temperature	No data available
Auto-ignition Temperature	No data available
Lower Explosion Limit	No data available
Upper Explosion Limit	No data available
Thermal Decomposition Temperature	No data available
Vapor Pressure	No data available
Density	1.533 g/mL @ 25 °C
Water Solubility	Negligible
Partition Coefficient ( <i>n</i> -octanol/water)	No data available
Relative Vapor Density (Air = 1)	>1
Odor	Ethereal
Odor Threshold	No data available
Evaporation Rate	No data available
Refractive index	1.292 @ 20 °C

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## 10. STABILITY AND REACTIVITY

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<b>Storage stability</b>	Stable under recommended storage conditions.
<b>Possibility of hazardous reactions</b>	Polymerization will not occur.
<b>Conditions to avoid</b>	Keep away from open flames and heated surfaces above 200 °C (392 °F). Keep dry.
<b>Materials to avoid</b>	Strong oxidizing agents. Strong acids and bases. Alkaline metals.
<b>Hazardous decomposition products</b>	Hazardous decomposition products formed under fire conditions - carbon oxides, hydrogen fluoride, carbonyl fluoride.

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## 11. TOXICOLOGICAL INFORMATION

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<b>Exposure limits</b>	None established
<b>Acute toxicity</b>	Oral: No data available Static inhalation LC50 (rat) = 3.16 mg/L/2h
<b>Skin corrosion/irritation</b>	No data available.
<b>Serious eye damage/eye irritation</b>	No data available.
<b>Respiratory or skin sensitization</b>	No data available.
<b>Germ cell mutagenicity</b>	No data available.
<b>Carcinogenicity</b>	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.  NTP: No component of this product present at

levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity** No data available

**Specific target organ toxicity (Globally Harmonized System)**

**Single exposure** No data available

**Repeated exposure** Toxic by inhalation.

**Aspiration Hazard** No data available

**Potential Health Effects**

**Inhalation** May cause respiratory irritation

**Skin** May cause skin irritation.

**Eyes** May cause eyes irritation.

**Ingestion** May be toxic if swallowed.

**Signs and Symptoms of Exposure** No data available

**Synergistic Effects** No data available

**Additional Information** No data available

**12. ECOLOGICAL INFORMATION**

**Toxicity** No data available

**Persistence and Degradability** No data available

**Bioaccumulative Potential** No data available

**Mobility in Soil** No data available

**PBT and vPvB Assessment** No data available

**Air, Photolysis, ODP = 0** Result: no effect on stratospheric ozone.  
Reference value for CFC 11: ODP = 1.

**Air, Greenhouse Effect** GWP: No data.  
Reference value for carbon dioxide: GWP = 1.

**Other adverse effects** No data available

**13. DISPOSAL CONSIDERATIONS**

**Product** Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Contact Fluoryx to return unused product.

**Contaminated packaging** Dispose of as unused product.

**14. TRANSPORTATION INFORMATION**

**DOT (US)** Class 6.1  
Proper shipping name: TOXIC LIQUID, ORGANIC, N.O.S. (1,1,2,2-Tetrafluoroethyl-2,2,3,3-Tetrafluoropropyl Ether)  
UN Number: 2810  
Packing group III



Labeling: 6.1

**IMDG**

Class 6.1  
 Proper shipping name: TOXIC LIQUID, ORGANIC, N.O.S. (1,1,2,2-Tetrafluoroethyl-2,2,3,3-Tetrafluoropropyl Ether)  
 UN Number: 2810  
 Packing group III



Labeling: 6.1

**IATA**

Class 6.1  
 Proper shipping name: TOXIC LIQUID, ORGANIC, N.O.S. (1,1,2,2-Tetrafluoroethyl-2,2,3,3-Tetrafluoropropyl Ether)  
 UN Number: 2810  
 Packing group III



Labeling: 6.1

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**15. REGULATORY INFORMATION**

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<b>OSHA Hazards</b>	Toxic liquid
<b>TSCA Status</b>	Not listed on US TSCA Inventory. It is for research and development use only.
<b>DSL Status</b>	The substance is not specified on any list.
<b>SARA 302 Components</b>	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
<b>SARA 313 Components</b>	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.
<b>SARA 311/312 Hazards</b>	Acute health hazard
<b>Massachusetts Right To Know Components</b>	1,1,2,2-Tetrafluoroethyl-2,2,3,3-tetrafluoropropyl ether CAS-No. 16627-68-2
<b>Pennsylvania Right To Know Components</b>	1,1,2,2-Tetrafluoroethyl-2,2,3,3-tetrafluoropropyl ether CAS-No. 16627-68-2
<b>New Jersey Right To Know Components</b>	1,1,2,2-Tetrafluoroethyl-2,2,3,3-tetrafluoropropyl ether CAS-No. 16627-68-2
<b>California Prop. 65 Components</b>	This product does not contain any chemicals known

to State of California to cause cancer, birth defects, or any other reproductive harm.

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**16. OTHER INFORMATION**

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**HMIS Classification**

Health Hazard:	2
Flammability:	0
Physical hazards:	0

**NFPA Rating**

Health Hazard:	2
Fire:	0
Reactivity Hazard:	0

**Legal Disclaimer:**

Not for drug, household, or other uses. The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. Unless noted to the contrary, the technical information applies only to pure product.

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End of SDS