

---

The MSDS format adheres to U.S. standards and regulatory requirements and may not meet regulatory requirements in other countries.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience are gained.

---

---

## **FE-227**

6160FR

Revised 22-SEP-2000

Printed 30-MAR-2001

---

---

### **CHEMICAL PRODUCT/COMPANY IDENTIFICATION**

---

#### Material Identification

FE-227 is a registered trademark of DuPont.

CAS Number	: 431-89-0
Formula	: CF <sub>3</sub> CHF CF <sub>3</sub>
Molecular Weight	: 170.04
CAS Name	: Propane, 1,1,1,2,3,3,3-Heptafluoro-

#### Tradenames and Synonyms

HFA 227ea  
FC-227ea  
Dymel 227 ea/p  
2-Hydroperfluoropropane  
Propane, 1,1,1,2,3,3,3-Heptafluoro-  
HFC-227ea  
2-Hydroheptafluoropropane  
FM-200(tm) Great Lakes Chemical Corp.  
Heptafluoropropane

#### Company Identification

MANUFACTURER/DISTRIBUTOR  
DuPont  
Fluoroproducts  
1007 Market Street  
Wilmington, DE 19898

PHONE NUMBERS

Product Information : 1-800-441-7515  
Transport Emergency : CHEMTREC 1-800-424-9300  
Medical Emergency : 1-800-441-3637

---

## COMPOSITION/INFORMATION ON INGREDIENTS

---

Components

Material	CAS Number	%
1,1,1,2,3,3,3-Heptafluoropropane	431-89-0	99+

---

## HAZARDS IDENTIFICATION

---

Potential Health Effects

Symptoms similar to oxygen deprivation (headache, nausea, dizziness or loss of consciousness) may result from overexposure by inhalation. Gross overexposure by inhalation may cause irregular pulse, heart palpitations and potentially fatal cardiac sensitization. Cold, white or discolored skin or in severe cases blistering, can be a sign of frostbite caused by cold liquids or gases.

Eyes: Direct eye contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues.

Skin: Direct skin contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues.

Ingestion: Not expected to be a hazard in normal industrial use.

Inhalation: Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and/or heart irregularities (arrhythmias). Misuse of product by deliberately inhaling high concentrations of this gas could cause death without warning.

Medical Conditions Aggravated by Exposure: Persons with pre-existing cardiac, respiratory or central nervous system disorders may be more susceptible to effects of an overexposure.

Notice to Physicians: Overexposure to this material may make the heart more susceptible to arrhythmias. Catecholamines such as adrenaline and other compounds having similar effects should be reserved for emergencies and then used only with special caution.

Vapors are heavier than air and pose a hazard of suffocation if trapped in enclosed or low places.

#### Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

---

## FIRST AID MEASURES

---

### First Aid

#### INHALATION

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

#### SKIN CONTACT

Treat for frostbite if necessary by gently warming affected area.

#### EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

#### INGESTION

Ingestion is not considered a potential route of exposure.

---

## FIRE FIGHTING MEASURES

---

### Flammable Properties

1,1,1,2,3,3,3-Heptafluoropropane is not flammable, however in the presence of a flame or ignition source it may decompose to form toxic hydrogen fluoride or carbonyl fluoride.

Non-flammable.

### Extinguishing Media

Use media appropriate for surrounding material.

### Fire Fighting Instructions

Self-contained breathing apparatus (SCBA) may be required if cylinders rupture or release under fire conditions.

Keep cylinders cool with water spray applied from a safe distance.

---

## **ACCIDENTAL RELEASE MEASURES**

---

### Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Keep upwind of leak - evacuate until gas has dispersed.

### Initial Containment

Use forced ventilation to disperse vapors.

---

## **HANDLING AND STORAGE**

---

### Handling (Personnel)

Do not breathe gas. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Wash clothing after use.

### Storage

Store in a well ventilated place. Store in a cool, dry place. Keep container tightly closed.

---

## **EXPOSURE CONTROLS/PERSONAL PROTECTION**

---

### Engineering Controls

Use only with adequate ventilation. Keep container tightly closed.

### Personal Protective Equipment

#### EYE/FACE PROTECTION

Wear safety glasses or coverall chemical splash goggles.

#### RESPIRATORS

Wear NIOSH approved respiratory protection, as appropriate.

#### PROTECTIVE CLOTHING

Where there is potential for skin contact have available and wear as appropriate impervious gloves, apron, pants, and jacket.

#### Exposure Guidelines

##### Exposure Limits

FE-227

AEL \* (DuPont) : 1000 ppm, 8 & 12 Hr. TWA

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

---

## PHYSICAL AND CHEMICAL PROPERTIES

---

### Physical Data

Boiling Point	: -15.6 C (3.9 F)
Melting Point	: -133 C (-207 F)
Vapor Pressure	: 66.69 psia @ 25 C (77 F) (460.06 kPa)
Liquid Density	: 1.386 g/cm <sup>3</sup> @ 25 C (77 F) (86.53 lb/ft <sup>3</sup> )
Critical temperature	: 101.6 C (214.9 F)
Critical pressure	: 424.7 psia (2930 kPa)
Odor	: Slight Ethereal
Form	: Liquified Gas

---

## STABILITY AND REACTIVITY

---

### Chemical Stability

Stable at normal temperatures and storage conditions.

Avoid sources of heat or open flame.

### Incompatibility with Other Materials

Incompatible with strong reducing agents such as alkali metals (e.g., sodium, potassium), alkali-earth metals (e.g., magnesium, calcium), and powdered aluminum or zinc.

### Decomposition

Decomposes by reaction with high temperature (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid, carbonyl fluorides, carbon monoxide and carbon dioxide.

Polymerization

Polymerization will not occur.

---

## **TOXICOLOGICAL INFORMATION**

---

### Animal Data

Groups of six rats were exposed for four hours to 25,000 or 53,000 ppm of FC-227ea. No deaths occurred. Signs of toxicity during exposure included irregular breathing, slight lacrimation and red ears. No toxic signs were seen post exposure.

Animal studies have found the rat four hour LC50 to be >788,696 ppm (80%), the highest level tested. A cardiac sensitization study in dogs found the No Observable Adverse Effect Level (NOAEL) to be 9.0%. The Lowest Observable Adverse Effect Level (LOAEL) for this study was reported to be 10.5%. A 90 day inhalation study did not find any exposure related effects at 105,000 ppm (10.5% vol./vol.), the highest level tested.

Tests have shown that this material does not cause genetic damage in bacterial and mammalian cell cultures. When evaluated by an in-vivo mouse micronucleus assay, no increase in micronuclei was observed.

---

## **DISPOSAL CONSIDERATIONS**

---

### Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Incinerate material in accordance with Federal, State/Provincial and Local requirements.

---

## **TRANSPORTATION INFORMATION**

---

### Shipping Information

DOT	
Proper Shipping Name	: Heptafluoropropane
Hazard Class	: 2.2
I.D. No. (UN/NA)	: UN 3296
DOT Label(s)	: Nonflammable Gas

---

## REGULATORY INFORMATION

---

### U.S. Federal Regulations

TSCA Inventory Status : Listed.

### TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes  
Chronic : No  
Fire : No  
Reactivity : No  
Pressure : No

---

## OTHER INFORMATION

---

### NFPA, NPCA-HMIS

NFPA Rating  
Health : 1  
Flammability : 0  
Reactivity : 1

NPCA-HMIS Rating  
Health : 1  
Flammability : 0  
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

### Additional Information

Some of the health and toxicity information was provided from a Great Lakes Chemical Corporation MSDS.

---

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : MSDS Coordinator  
> : DuPont Fluoroproducts  
Address : Wilmington, DE 19898  
Telephone : (800) 441-7515

End of MSDS