



ACCORDING TO US CFR 1910.1200

**1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

## 1.1 Product identifier

Product Name	HEPTAFLUOROPROPANE (R-227ea)
Trade Name	R-227ea, 1,1,1,2,3,3,3-heptafluoropropane
CAS No.	431-89-0
EC No.	207-079-2

## 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	Refrigerant.
Uses Advised Against	Not known.

## 1.3 Details of the supplier of the safety data sheet

Company Identification	Hudson Technologies Company
Address	PO Box 1541 One Blue Hill Plaza Pearl River, New York USA
Postal code	10965
Telephone:	+1 (800) 953 2244
Fax	+1 (845) 512 6070
E-mail	information@hudsontech.com

## 1.4 Emergency telephone number

Emergency Phone No.	+1 (800) 501 4376
CHEMTREC (U.S.)	+1 (800) 424 9300
INTERNATIONAL	+1 (703) 527 3887

**2. SECTION 2: HAZARDS IDENTIFICATION**

2.1 Classification of the substance or mixture

US CFR 1910.1200                      Gases under pressure; Press. Gas; Liquefied gas.

2.2 Label elements

Product Name                              HEPTAFLUOROPROPANE (R-227ea)

Hazard Pictogram(s)



GHS04

Signal Word(s)                              Warning

Hazard Statement(s)                      H280: CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.  
 OSHA-H01: MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.  
 CGA-HG01: MAY CAUSE FROSTBITE.

Precautionary Statement(s)              P202: Do not handle until all safety precautions have been read and understood.  
 P262: Do not get in eyes, on skin, or on clothing.  
 P271+P403: Use and store only outdoors or in a well-ventilated place.  
 P280+P284: \*Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection.  
 P304, P340, P313: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.  
 P304, P340, P312: \*\* IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.  
 P302, P336, P315: IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

2.3 Other hazards

May cause asphyxiation when concentrations are sufficient to reduce oxygen below safe breathing levels.

May cause frost-bite.

2.4 Additional Information

CGA-PG05: Use a back flow preventive device in the piping.

CGA-PG06: Close valve after each use and when empty.

CGA-PG02: Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).

CGA-PG27: Read and follow the Safety Data Sheet (SDS) before use.

This SDS is available in languages other than English.

**3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

HAZARDOUS INGREDIENT(S)	Common Names	CAS No.	%W/W	Hazard Statement(s)	Hazard Pictogram(s)
1,1,1,2,3,3,3-heptafluoropropane	R-227ea, Heptafluoropropane	431-89-0	100	Press. Gas, Liquefied gas; H280	GHS04

**4. SECTION 4: FIRST AID MEASURES**

4.1 Description of first aid measures

Inhalation

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if necessary. If breathing has stopped, apply artificial respiration. Get medical attention.

Skin Contact

Flush skin with large amounts of water. Thaw frosted parts with lukewarm water. Do no rub affected area. If symptoms persist, obtain medical attention.

Eye Contact	Flush eyes with water for at least 15 minutes while holding eyelids open. If symptoms persist, obtain medical attention.
Ingestion	Unlikely route of exposure.
4.2 Most important symptoms and effects, both acute and delayed	Inhalation: High concentrations: Dizziness, Nausea, Unconsciousness.
4.3 Indication of any immediate medical attention and special treatment needed	Treat symptomatically.

## 5. SECTION 5: FIREFIGHTING MEASURES

Non-flammable.

### 5.1 Extinguishing media

Suitable Extinguishing media As appropriate for surrounding fire.

Unsuitable extinguishing media None.

### 5.2 Special hazards arising from the substance or mixture

Contains gas under pressure; may explode if heated. The product should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. Decomposes in a fire giving off toxic fumes: Carbon monoxide, Carbon dioxide, Hydrogen fluoride, Carbonyl halides.

### 5.3 Advice for fire-fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. If it is safe to do so, containers should be removed from fire area because they are likely to rupture under fire conditions. Keep containers cool by spraying with water if exposed to fire.

## 6. SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact.

### 6.2 Environmental precautions

Do not release large quantities into the surface water or into drains.

### 6.3 Methods and material for containment and cleaning up

Allow small spillages to evaporate provided there is adequate ventilation.

6.4 Reference to other sections

See Also Section 8, 13.

**7. SECTION 7: HANDLING AND STORAGE**

7.1 Precautions for safe handling

Provide sufficient ventilation. Avoid breathing gas. Avoid contact with skin and eyes. Wear protective gloves/protective clothing/eye protection/face protection. Do not drag, roll, slide or drop cylinders. Use a suitable hand truck design for cylinder movement. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object into valve cap openings. Doing so may damage valve causing a leak to occur. Secure cylinders in an upright position at all times, close all valves when not in use. Keep closed even when empty. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Protect from sunlight. Store in a well-ventilated place.

Storage temperature

125°F < (<52°C)

Storage life

Stable under normal conditions.

Incompatible materials

Strong oxidizing agents, finely powdered metals.

**8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

8.1 Control parameters

Occupational Exposure Limits None assigned.

8.2 Exposure controls

Appropriate engineering controls Ensure adequate ventilation.

Personal protection equipment

Wear suitable eye/face protection.



Eye Protection



Skin protection

Wear suitable gloves.



Respiratory protection

Where engineering controls are not fitted or inadequate wear suitable respiratory protective equipment.

Thermal hazards Not applicable.

**9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

9.1 Information on basic physical and chemical properties

Appearance	Gas.
	Color: Colorless.
Odor	Odorless.
Odor threshold	Not established.
pH	Neutral.
Melting point/freezing point	-201°F (-129.5°C)
Initial boiling point and boiling range	-0.4 – -(3.2)°F (-18 – (-16)°C)
Flash Point	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Non-flammable.
Upper/lower flammability or explosive limits	Not applicable.
Vapor pressure	404 kPa @ 20°C (68°F)
Vapor density	6.04
Density	1.41 g/cm <sup>3</sup> @ 25°C (77°F)
Relative density	1.46
Solubility(ies)	Solubility (Water): Slightly soluble. Solubility (Other): Not available.
Partition coefficient: n-octanol/water	2.29
Auto-ignition temperature	Not applicable.
Decomposition Temperature (°C)	Not available.
Viscosity	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

## 9.2 Other information

None.

## 10. SECTION 10: STABILITY AND REACTIVITY

## 10.1 Reactivity

Stable under normal conditions. Certain mixtures of HFC227ea with chlorine may become flammable or reactive under certain conditions.

## 10.2 Chemical Stability

Stable under normal conditions.

## 10.3 Possibility of hazardous reactions

No hazardous reactions known if used for its intended purpose.

## 10.4 Conditions to avoid

Keep away from heat and direct sunlight.

## 10.5 Incompatible materials

Strong oxidizing agents, finely powdered metals.

## 10.6 Hazardous decomposition product(s)

Halogens, halogen acids and possibly carbonyl halides.

## 11. SECTION 11: TOXICOLOGICAL INFORMATION

## 11.1 Information on toxicological effects

Acute toxicity - Ingestion	Low acute toxicity.
Acute toxicity - Skin Contact	Low acute toxicity.
Acute toxicity - Inhalation	Low acute toxicity. LC50 (4.5hour(s)) = $\geq$ 241188ppm
Skin corrosion/irritation	Non-irritant.
Serious eye damage/irritation	Non-irritant.
Skin sensitization data	Not classified.
Respiratory sensitization data	Not classified.
Germ cell mutagenicity	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	Not classified.
Lactation	Not classified.
STOT - single exposure	None anticipated.
STOT - repeated exposure	None anticipated.
Aspiration hazard	Not classified.

## 11.2 Other information

None.

## 12. SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

Toxicity - Aquatic invertebrates Low toxicity to invertebrates.

Toxicity - Fish Low toxicity to fish.

Toxicity - Algae Low toxicity to algae.

Toxicity - Sediment Not classified.

Compartment

Toxicity - Terrestrial Not classified.

Compartment

### 12.2. Persistence and Degradation

This substance is not readily biodegradable.

### 12.3. Bioaccumulative potential

The substance has low potential for bioaccumulation.

### 12.4. Mobility in soil

Not applicable.

### 12.5 Other adverse effects

Not known.

## 13. SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

Containers must not be punctured or destroyed by burning, even when empty. Refer to manufacturer/supplier for information on recovery/recycling.

### 13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.



**14. SECTION 14: TRANSPORT INFORMATION**

14.1 UN number

UN No. 3296

14.2 UN proper shipping name

UN proper shipping name HEPTAFLUOROPROPANE

14.3 Transport hazard class(es)

ADR/RID Class 2.2  
 IMDG Class 2.2  
 IMDG EMS Not available

ICAO/IATA

Excepted Quantities E1

Passenger and Cargo Aircraft

Limited Quantities Packing

Instructions

Cargo Aircraft Limited Quantities

Max net Qty

Special Provisions Not applicable

Emergency Response 2 L

Guidebook (ERG) Code

ADR Classification Code 2A

ADR HIN 20

ADR Transport Category 3

Tunnel Restriction Code C/E

Emergency Action Code 2T

Advice on Additional Personal Protection (APP) Not applicable

14.4 Packing group

Packing group Not applicable

Labels 2.2



Special Provisions Not applicable

Limited Quantities 120 m

Excepted Quantities E1



Mixed Packing Instructions for P200  
Packages

Special Packing Provisions for Not applicable  
Packages

Mixed Packing Instructions for MP9  
Packages

#### 14.5 Environmental hazards

Environmental hazards Not classified as a Marine Pollutant.

#### 14.6 Special precautions for user

Special precautions for user Not known.

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

Packing Instructions for Portable (M) T50  
Tanks

Special Provisions for Portable Not applicable  
Tanks

Tank Code for Tanks PxBN(M)

Special Provisions for Tanks TA4 TT9

Vehicle for Tank Carriage AT

Special Provisions for Carriage - Not applicable  
Packages

Special Provisions for Carriage - Not applicable  
Bulk

Special Provisions for Carriage - CV9 CV10 CV36  
Loading, Unloading and Handling

Special Provisions for Carriage - Not applicable  
Operation

## 15. SECTION 15: REGULATORY INFORMATION

### 15.1 Federal

Toxic and hazardous substances Not listed.

(29 CFR 1910; Subpart Z )

National emission standards for Not listed.

hazardous air pollutants (40 CFR

61.01)

Title III Consolidated List of Lists Not listed.



SAFETY DATA SHEET

1-Sep-2017

TSCA (Toxic Substance Control Act) 1,1,1,2,3,3,3-heptafluoropropane (CAS No.: 431-89-0)

CAA 602 - Ozone Depleting Substances (ODS) Not listed.

15.2 State

State Right to Know Lists Not listed.

Proposition 65 (California) Not listed.

15.3 Other

OSPAR List of Chemicals for Priority Action Not listed.

NTP (National Toxicology Program) Not listed.

OSHA (List of Highly Hazardous Chemicals, Toxics and Reactives) Not listed.

IARC (International Agency for Research on Cancer) Not listed.

**16. SECTION 16: OTHER INFORMATION**

The following sections contain 1-16 revisions or new statements:

NFPA		HMIS	
Health	1	Health	1
Fire	0	Flammability	0
Instability	1	Physical hazards	0

## LEGEND:

Hazard Pictogram(s)



GHS04

Hazard Statement(s)

H280: Contains gas under pressure; may explode if heated.

Precautionary Statement(s)

P410+P403: Protect from sunlight. Store in a well-ventilated place.

Additional Information required by Federal Standard 313 Rev. E:

Contract or Solicitation Number: SPE4A6-16-D-0226

Prime Contractor: Hudson Technologies, Inc.

Prime Contractor CAGE: 7DSQ0

National Stock Number (NSN): 6830014937896

Specification Reference:

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