



# TULSTAR PRODUCTS, INC.

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## MATERIAL SAFETY DATA SHEET

Product Name: HFC-227ea

Effective Date: 04/07/98

### **SECTION 1-CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product Name: HFC-227ea

Manufacturer: TULSTAR PRODUCTS, INC.

Address: 5510 S. Lewis Ave.

City: Tulsa

State: OK

Zip: 74105

Emergency Telephone Number: 1-800-949-5167

Information Telephone Number: 1-918-747-9060 Fax: 1-918-747-1444

Chemtrec Phone: 1-800-424-9300

Effective Date: 04/07/98

Precede Date: 08/11/97

MSDS Prepared By: Tulstar Products, Inc.

Synonyms: 1,1,1,2,3,3,3-Heptafluoropropane, 2H-Heptafluoropropane

Product Use: Fire extinguishing, fire suppression, explosion suppression and inerting agent

Chemical Name: 1,1,1,2,3,3,3-Heptafluoropropane

Chemical Family: Halogenated alkane

### *Additional Information*

No information available.

### **SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS**

INGREDIENT NAME	CAS No.	%	EXPOSURE LIMITS
1,1,1,2,3,3,3-Heptafluoropropane	431890		>99 Y (Hazardous)

Not established (OSHA PEL TWA)  
Not established (OSHA PEL STEL)  
Not established (OSHA PEL CEIL)  
Not established (ACGIH TLV TWA)  
Not established (ACGIH TLV STEL)  
Not established (ACGIH TLV CEIL)

\*Mixture. Indented chemical components of mixture.

### *Additional Information*

No information available

### **SECTION III – HAZARDS IDENTIFICATION**

#### **Emergency Overview:**

Colorless gas

Odorless

Direct eye or skin contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues. May cause central nervous system effects. Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and/or heart irregularities.

#### **Relevant Routes of Exposure:**

Inhalation

#### **Signs & Symptoms of Overexposure:**

Symptoms similar to oxygen deprivation (headache, nausea, dizziness or loss of consciousness) may result from overexposure by inhalation. Heart irregularities such as irregular pulse or heart palpitations may indicate cardiac sensitivity. Cold, white or discolored skin or in severe cases blistering, can be a sign of frostbite caused by cold liquids or gases.

#### **Medical Conditions Generally**

##### **Aggravated by Exposure:**

Persons with preexistence cardiac, respiratory, or central nervous system disorders may be more susceptible to effects of an overexposure. The use of epinephrine or similar compounds can increase susceptibility to heart irregularities caused by excessive exposure to these types of compounds.

#### **Potential Health Effects:**

See Section XI for additional information.

##### **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 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 the product by deliberately inhaling high concentrations of this gas could cause death without warning.

#### **Carcinogenicity:**

##### **NTP:**

No

##### **IAEC:**

No

##### **OSHA:**

No

##### **ACGIH:**

No

##### **OTHER:**

No

### *Additional Information*

No information available

#### **SECTION IV – FIRST AID MEASURES**

**Eyes:**

Flush with water. Get medical attention.

**Skin:**

Flush with water; if frostbite occurs get medical attention.

**Ingestion:**

No information available

**Inhalation:**

Remove person to fresh air; if not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Antidotes:**

No information available

**Notes to Physicians and/or Protection  
For First-Aiders:**

The use of epinephrine or similar compounds can increase susceptibility to heart irregularities caused by excessive exposure to these types of compounds.

#### ***Additional Information***

No information available

#### **SECTION V – FIRE FIGHTING MEASURES**

**Flammable Limits in Air (% by Volume):**

Not applicable

**Flash Point:**

Nonflammable gas

**Autoignition Temperature:**

Not available

**Extinguishing Media:**

All conventional media are suitable.

**Fire Fighting Instructions:**

Keep cylinders cool with a water spray applied from a safe distance. Use a self-contained breathing apparatus if containers rupture or release under fire conditions. Do not allow reentry into areas where this material has been released without first ventilating to remove products of combustion/decomposition.

**Unusual Fire & Explosion Hazards:**

Although containers of our product are provided with pressure and temperature relief devices, containers can rupture if exposed to localized heat. Thermal decomposition will generate toxic and corrosive gases. Nonflammable gas

**Flammability Classification:**

**Known or Anticipated Hazardous  
Products of Combustion:**

Decomposition by elevated temperatures (fire conditions, glowing metal surfaces) may generate hazardous decomposition products common to other CFCs, HCFCs or HBFCs. These can include hydrogen fluoride, carbon monoxide, carbon dioxide and others.

#### ***Additional Information***

No information available

#### **SECTION VI – ACCIDENTAL RELEASE MEASURES**

**Accidental Release Measures:**

Evacuate the area and ventilate. Do not enter areas where high concentrations may exist (especially confined or poorly including a self-contained breathing apparatus.

**Personal Precautions:**

See Section VIII

**Environmental Precautions:**

No information available

*Additional Information*

No information available

**SECTION VII – HANDLING & STORAGE**

**Handling:**

Use the same type of precautions as would be used in handling any cryogenic gas. Protect container form damage. Handle in well-ventilated areas. When this material is sued as a firefighting agent in fixed or portable extinguishing systems, follow manufacture’s instructions for operation, inspection, maintenance and repair of the system.

**Storage:**

Store in a cool, dry, well-ventilated area away from incompatible materials.

Keep container tightly closed.

**Other Precautions:**

No information available

*Additional Information*

No information available

**SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Engineering Controls:**

No information available

**Ventilation Requirements:**

Use local ventilation to minimize exposure to gas.

Use mechanical ventilation for general area control.

**Personal Protective Equipment:**

**Eye/Face Protection:**

Chemical splash goggles when handling liquid

**Skin Protection:**

Use lined neoprene gloves if handling liquid

Clothing designed to minimize skin contact

**Respiratory Protection:**

Wear a NIOSH/MSHA approved self-contained breathing apparatus in emergency situations. Contact the OSHA reparatory protection information located the 29CFR 1910.314 and the American National Standard Institute’s Practices of Reparatory Protection Z88.2.

**Other Protective Clothing  
Or Equipment:**

No information available

**Exposure Guidelines:**

See Section II.

**Work Hygienic Practices:**

Wash thoroughly after handling

Wash contaminated clothing before use.

Make sure piping is empty before doing maintenance work.

### *Additional Information*

No information available

#### **SECTION IX – PHYSICAL & CHEMICAL PROPERTIES**

<b>Appearance:</b>	Colorless gas
<b>Boiling Point:</b>	-16.4 degrees C (3 degrees F)
<b>Bulk Density:</b>	Not available
<b>Color Decomposition:</b>	Colorless
<b>Temperature:</b>	Not available
<b>Evaporation Rate:</b>	Not available
<b>Freezing Point:</b>	Not available
<b>Heat Value:</b>	Not available
<b>Melting Point:</b>	-131 degrees C (-204 degrees F)
<b>Molecular/Chemical Formula:</b>	C3HF7
<b>Molecular Weight:</b>	170
<b>Octanol/Water Partition Coefficient:</b>	Not Available
<b>Odor:</b>	Odorless
<b>Odor Threshold:</b>	Not Available
<b>Particle Size:</b>	Not Available
<b>Percent Volatile:</b>	Not Available
<b>pH Value:</b>	Not Available
<b>pH Concentration:</b>	Not Available
<b>Physical State:</b>	Gas
<b>Reactivity in Water:</b>	Not water reactive
<b>Saturated Vapor Concentration:</b>	Not Available
<b>Softening Point:</b>	Not Available
<b>Solubility in Water:</b>	260 mg/L
<b>Specific Gravity or Density (Water=1):</b>	1.46
<b>Vapor Density:</b>	6.04
<b>Vapor Pressure:</b>	58.8 psia at 70 degrees F (21 degrees C)
<b>Viscosity:</b>	Not Available
<b>Volatile Organic Compounds:</b>	Not Available
<b>Water/Oil Distribution Coefficient:</b>	Not Available
<b>Weight Per Gallon:</b>	Not Available

### *Additional Information*

No information available

#### **SECTION X – STABILITY & REACTIVITY**

<b>Stability:</b>	Stable under normal conditions of handling and use
<b>Conditions to Avoid:</b>	None

**Incompatibility with Other Materials:**

Powdered metals (ex. Al, Mg, or Zn) and strong alkalis, oxidizers or reducing agents are not compatible with this and most other halogenated organic compounds.

**Hazardous Decomposition Products:**

Thermal decomposition may produce the following:  
Hydrogen fluoride

Carbon monoxide and carbon dioxide

**Hazardous Polymerization:**

Will not occur

**Conditions to Avoid:**

None

*Additional Information*

No information available

**SECTION XI – TOXICOLOGICAL INFORMATION**

Value (LD50 or LC50)	Animal	Routes	Components
>788,696 ppm/4H	Rat	Acute Inhalation	1,1,1,2,3,3,3-Heptafluoropropane

**Toxicological Information:**

The human health hazards of this product are expected to be similar to other liquefied gases including N<sub>2</sub>, CO<sub>2</sub>, CFCs, HCFCs, and HBFCs. Therefore, direct eye or skin contact with the liquid or possibly frostbite of exposed tissues. Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and /or heat irregularities (arrhythmias). Misuse of the product by deliberately inhaling high concentrations of this gas could cause death without warning. Persons with preexisting cardiac or central nervous systems disorders may be more susceptible to effects of an overexposure.

When tested with and without metabolic activation over a concentration range of 43.9-93.5 %, heptafluoropropane was not mutagenic in *S. typhimurium*. Neither toxicity nor mutagenicity was observed in a mouse lymphoma assay when heptafluoropropane was tested to a concentration of 56.8%. Neither toxicity nor an increase in micronuclei was observed in mice exposed to 10.5% heptafluoropropane. Therefore, there is no evidence that heptafluoropropane is capable of inducing gene or chromosomal mutations in vitro or chromosomal effects in vivo. In other studies, heptafluoropropane did not show genotoxicity or cytotoxicity.

Animal studies have found that rat 4 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. Inhalation studies looking for developmental effects on pregnant rabbits and rats or their offspring did not show any exposure related effects at the highest concentration tested (105,000 ppm).

*Additional Information*

No information available

**SECTION XII – ECOLOGICAL INFORMATION**

**Ecological Information:** No information available

*Additional Information*

No information available

**SECTION XIII – DISPOSAL CONSIDERATIONS**

**Disposal Considerations:** Non-contaminated product is reclaimable. Otherwise, dispose of waste in an approved chemical incinerator equipped with a scrubber as allowed by current Local, State/Providence, Federal/Canadian laws and regulations.

*Additional Information*

No information available

**SECTION XIV – TRANSPORT INFORMATION**

	<b><u>U.S. DOT</u></b>
<b>Proper Shipping Name:</b>	Heptafluoropropane
<b>Hazard Class:</b>	2.2
<b>ID Number:</b>	UN3296
<b>Packing Group:</b>	N/A
<b>Labels:</b>	Nonflammable gas
<b>Special Provisions:</b>	N/A
<b>Packaging Exceptions:</b>	306

<b>Non-Bulk Packaging:</b>	304
<b>Bulk Packaging:</b>	314, 315
<b>Air/Rail Limit:</b>	75 kg
<b>Air Cargo Limit:</b>	150 kg
<b>Vessel Stowage:</b>	A
<b>Other Stowage:</b>	N/A
<b>Reportable Quantity:</b>	N/A

#### **AIR – ICAO OR IATA**

<b>Proper Shipping Name:</b>	Heptafluoropropane
<b>Hazard Class:</b>	2.2
<b>ID Number:</b>	UN3296
<b>Subsidiary Risk:</b>	N/A
<b>Packaging Group:</b>	N/A
<b>Hazard Labels:</b>	Nonflammable gas
<b>Packaging Instructions:</b>	200
<b>Air Passenger Limit Per Package:</b>	75 kg
<b>Packaging Instructions – Cargo:</b>	200
<b>Air Cargo Limit Per Package:</b>	150 kg
<b>Special Provisions Code:</b>	N/A

#### **WATER – IMDG**

<b>Proper Shipping Name:</b>	Heptafluoropropane
<b>Hazard Class:</b>	2.2
<b>ID Number:</b>	UN3296
<b>Packing Group:</b>	N/A
<b>Subsidiary Risk:</b>	N/A
<b>Medical First Aid Guide Code:</b>	350

#### ***Additional Information***

EmS No. 2-09

#### **SECTION XV – REGULATORY INFORMATION**

<b>U.S. Federal Regulations:</b>	The components of this product are either on the TSCA Inventory or exempt (i.e. impurities, a polymer complying with the exemption rule at 40 CFR 723.250) from the Inventory.
<b>State Regulations:</b>	None known
<b>International Regulations:</b>	This material (or each component) is listed on the following inventories: EU – EINECS

Canadian WHMIS Hazard Class and Division = A.

**SARA Hazards:**

<b>Acute:</b>	Yes
<b>Chronic:</b>	No
<b>Reactive:</b>	No
<b>Fire:</b>	No
<b>Pressure:</b>	No

*Additional Information*

The above regulatory information represents only select regulations and is not meant to be a complete list.

**SECTION XVI – OTHER INFORMATION**

**NFPA Codes:**

<b>Health:</b>		<b>1</b>
<b>Flammability:</b>	<b>0</b>	
<b>Reactivity:</b>		<b>0</b>
<b>Other:</b>		<b>0</b>

**HMIS Codes:**

<b>Health:</b>	1
<b>Flammability:</b>	0
<b>Reactivity:</b>	0
<b>Protection:</b>	X

**Label Statements:**

**Abbreviations:**

(L) = Loose bulk density in g/ml  
LOEC = Lowest observed effect  
MATC = Maximum acceptable toxicant concentration  
NA = Not available  
N/A = Not applicable  
NL = Not limited  
NOEC = No observed effect concentration  
NR = Not rated  
(P) = Packed bulk density in g/ml  
PNOC = Particulates Not Otherwise Classified  
PNOR = Particulates Not Otherwise Regulated  
REL = Recommended exposure limit  
TS = Trade secret

*Additional Information*

Information on this for is furnished solely for the purpose of compliance with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and the Canadian Environmental Protection Act, Canada Gasette Part II, Vol. 122, No. 2 and shall not be used for any other purpose.

**Revision Information:**

**Section XIV – IMDG Code Information**

**Section XV – Regulatory Information**