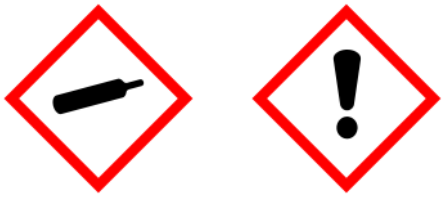
Section 1 – Chemical Product and Company Identification

Product Name	HFC-227ea
Chemical Name	1,1,1,2,3,3,3-Heptafluoropropane
Synonym	2H-Heptafluoropropane; HFC-227ea; R-227; MH227®; FM-200™; FE-227™
Product Use	Fire extinguishing agent

Section 2 –Hazard Identification

OSHA/HCS status	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Classification of the substance or mixture	Gases under pressure - Liquefied gas
GHS label elements	
Hazard pictograms	
Signal word	Warning
Hazard statements	H280: Contains gas under pressure; may explode if heated
Precautionary statements	P210: Keep away from heat/sparks/open flame. – No smoking P233: Keep container tightly closed in a cool/well-ventilated place P260: Do not breathe dust/fumes/gas/vapours/spray P273: Avoid release to the environment P280: Wear protective gloves/protective clothing/eye protection/face protection P403: Use and store only in a well-ventilated area
Other Hazard	Overheating and over pressurizing may cause gas release or violent cylinder bursting

Section 3 – Composition/Information on Ingredients

Ingredient name	CAS No.	%(weight)
1,1,1,2,3,3,3 - heptafluoropropane	431-89-0	≥99.90

Section 4 – First Aid Measures

Inhalation	Remove to fresh air Oxygen or artificial respiration if needed If unconscious, place in recovery position and get medical attention immediately
Skin	Flush exposed skin with lukewarm water (not hot), or use other means to warm skin slowly Remove contaminated clothing and shoes Get medical attention if frostbitten by liquid or if irritation persists
Eyes	Immediately flush with large amounts of water for at least 15 minutes Get medical attention if irritation occurs
Ingestion	As this product is a gas, refer to the inhalation section
Note to physician	Immediate medical attention is not required When symptoms persist or in all cases of doubt seek medical advice

Section 5 – Fire Fighting Measures

Extinguishing media	Heptafluoropropane is a fire extinguishing media. Use media appropriate for surrounding material
Special hazards arising from the substance or mixture	Thermal decomposition can lead to release of irritating or toxic gases/vapors: carbon oxides, halogenated compounds Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode
Special protective equipment for firefighters	Wear self-contained breathing apparatus with a full face-piece operated in positive pressure mode and chemical-protective clothing. Prevent fire extinguishing water from contaminating surface water or the ground water system

Section 6 – Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Refer to SECTION 8 for personal protective equipment. Prevention of skin and eye contact. Ensure adequate ventilation. Remove all sources of ignition. Shut off gas supply if this can be done safely. Isolate area until gas has dispersed
Environmental precautions	Do not discharge into drains/surface waters/groundwater

Methods and material for containment and cleaning up	Evacuate area. Keep upwind. Stop leak if without risk. Ventilate area especially low places remove open flames and heating elements. Disperse gas with floor level forced air
Reference to other SECTIONs	See SECTION 7 for information on safe handling See SECTION 8 for information on personal protection equipment See SECTION 13 for information on disposal

Section 7 – Handling and Storage

Handling	Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement
Storage	Keep container tightly closed and in a cool, well-ventilated place. Keep out of direct sunlight. Keep away from heat and ignition sources
Packing material	Steel drum

Section 8 –Exposure Controls/Personal Production

8.1 Control parameters

Occupational exposure limit values	Not established
DNEL (Derived No Effect Level) for workers and the general population	Not available
PNEC (Predicted No Effect Concentration) values	Not available

8.2 Exposure controls

Appropriate engineering controls	Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits
Personal protective equipment	
Respiratory Protection	In case of inadequate ventilation wear respiratory protection
Skin Protection	Wear protective gloves/clothing to prevent contact
Eye Protection	Safety glasses/chemical splash goggles
Environmental exposure controls	Do not empty into drains

Section 9 – Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance	Liquefied gas

Color	colorless
Odour	inodorous
pH	Not available
Melting point	Not available
Boiling point	-16.36 ℃
Flash point	Not available
Evaporation rate	Not available
Flammability (solid, gas)	Not flammable
Upper/lower flammability or explosive limits	Not available
Vapour pressure	457.7 Kpa (25 ℃)
Specific gravity（H_2O=1	1.388 g/cm^3
Solubility(ies)	Not available
Partition coefficient: n-octanol/water	log Kow = 2.11
Auto-ignition temperature	Not available
Viscosity	0.226 mPa.s (25 ℃)
Explosive properties.	Not available
Oxidising properties	Not available

9.2 Other information

No data available.

Section 10 – Stability and Reactivity

Reactivity	Stable under recommended storage and handling conditions (see SECTION 7, handling and storage)
Chemical stability	Stable under normal conditions of use
Possibility of hazardous reactions	No known hazardous reactions
Conditions to avoid	Keep away from heat and ignition sources. Protect from sunlight
Incompatible materials	Strong oxidizing materials
Hazardous decomposition products	Thermal decomposition can lead to release of irritating or toxic gases/vapors: carbon oxides, halogenated compounds

Section 11 – Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity

Ingredient name	LD50 Oral	LD50 Dermal	LC50 Inhalation
1,1,1,2,3,3,3 - heptafluoropropane	Not data available	Not data available	788,698 ppm/4h (rat).

Skin corrosion/irritation	No information available
Serious eye damage/irritation	No information available
Respiratory or skin sensitization	No information available

Germ cell mutagenicity	No information available
Reproductive toxicity	No information available
STOT-single exposure	No information available
STOT-repeated exposure	No information available
Aspiration hazard	No information available
Carcinogenicity	Not listed as a carcinogen by NTP, IARC, or OSHA

Section 12 – Ecological Information

Toxicity (Ecotoxicity Fish, LC $_{50}$)	Not available
Degradability	Atmospheric lifetime is approximately 34.2 years
Bioaccumulation/ Accumulation	Bioaccumulation is not expected (Log Kow < 3)
Mobility in Environmental Media	Not available
Other adverse effects	Ozone Depletion Potential (CFC 11 = 1.0): 0.00 Global Warming Potential (CO2 = 1.0): 3,220

Section 13 –Disposal Considerations

Waste Disposal Method

Disposal must be made according to local and national regulations. Empty containers should be taken for local recycling, recovery or waste disposal.

Section 14—Transport Information

Item	DOT	TDG	Mexico	IMDG	IATA / ICAO
UN-Number	3296	3296	3296	3296	3296
UN proper shipping name	Heptafluoropropane	Heptafluoropropane	Heptafluoropropane	Heptafluoropropane	Heptafluoropropane
Hazard class	2.2	2.2	2.2	2.2	2.2
Label					
Packaging Group	-	-	-	-	-

Special precautions for user	Avoid transportation in vehicles where the load space is not separated from the driver's compartment. Ensure valves are closed and not leaking Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident

Section 15—Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Listed in international inventories:

Ingredient name	TSCA	DSL	NDSL	ELINCS	ENCS	CHINA	KECL	PICCS	AICS
1,1,1,2,3,3,3 - heptafluoropropane	YES	YES	NDA	YES	YES	YES	YES	NDA	YES

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- not regulated.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- not regulated.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

- not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- not regulated.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- not regulated.

Section 16 – Other Information

In accordance with good practices of personal cleanliness and hygiene handle with the care and avoid unnecessary contact with this product.

This information is being supplied to you under OSHA Hazard Communication Standard 29 CFR 1910.1200 and is offered in good faith as typical values and not as a product specification. The information contained herein is based on the data available to us and is believed to be true and accurate.

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