


Safety Data Sheet R227EA

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name : R227ea
Supplier : Alpha Refrigerants UK Limited
Address : Shelton Street, Covent Garden, London, United Kingdom
Contact : info@alpharefrigerants.co.uk
Website : www.alpharefrigerants.co.uk

2. HAZARDS IDENTIFICATION

CLASSIFICATION : Gases under pressure, Liquefied Gas

HAZARD PICTOGRAM : 

SIGNAL WORD : WARNING

HAZARD STATEMENT : Contains gas under pressure, may explode if heated

SYMBOL : Gas Cylinder

PRECAUTIONARY STATEMENT : For STORAGE; Protect from sunlight, store in a well ventilated place

EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R227ea is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	REACH Registration	EEC No.	% (w/w)	Classification according to 1272/2008 [CLP]
1,1,1,2,3,3,3-heptafluoropropane (HFC 227EA)	431-89-0	01-2119485489-18	207-079-2	100%	Press. Gas (Liq. Gas); H280

4. FIRST AID MEASURES

- EYES:** Immediately flush with plenty of water. Get medical attention if irritation persists.
- SKIN:** Flush exposed skin with lukewarm water (not hot), or use other means to warm skin slowly. Get medical attention if frostbitten by liquid or if irritation occurs.
- SWALLOWED:** Not applicable - product is a gas at ambient temperatures.
- INHALED:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Do not give adrenaline, epinephrine or similar drugs following exposure to this product.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media:

This product is not flammable in air under ambient conditions of temperature and pressure. Use extinguishing media appropriate to the surrounding fire conditions.

5.2 Special hazards arising from the Substance or Mixture:

At high temperature, toxic and/or corrosive fumes may be produced by thermal decomposition (gaseous hydrogen fluoride (HF), carbon oxides).

5.3 Advice for Fire Fighters:

Wear self-contained breathing apparatus and protective clothing. Heat may cause the containers to explode. Keep fire exposed containers cool by spraying with water. Fire exposed containers may vent contents through pressure relief devices. In case of fire nearby, remove exposed containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures :

If outside keep bystanders upwind and away from danger point. Ventilate the area, especially low or enclosed places where heavy vapours might collect

6.2 Environmental precautions :

The product evaporates readily. Stop release if safe to do so. Prevent from entering sewers, basements and work pits, or any place where the accumulation can be dangerous.

6.3 Methods and materials for containment and cleaning up :

Material evaporates. Ventilate the area, especially low or enclosed places where heavy vapours might collect.

7. HANDLING STORAGE

7.1 Precautions for Safe Handling

Only experienced and properly instructed persons should handle gases under pressure. Protect containers from physical damage. Do not drag, roll, slide or drop. Do not remove or deface labels. Adopt best manual handling considerations when handling, carrying and dispensing. Secure cylinders in an upright position at all times. Close valves when not in use and when empty. Ensure adequate ventilation of the working area. Do not allow backfeed into the container. Avoid contact with skin and eyes. When using, do not eat, drink or smoke. Never use direct flame or electrical heating device to raise the pressure of the container.

7.2 Conditions for safe storage, including any incompatibilities

Keep containers tightly closed. Keep in a cool, dry, well-ventilated area. Store in correctly labelled containers. Keep away from sources of ignition – no smoking. Store out of direct sunlight.

- Recommended storage temperature : < 52 °C
- Storage period : > 10 yr
- Further information on storage stability : The product has an indefinite shelf life when stored properly

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Engineering Controls	:	Ensure adequate ventilation of the working area. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leaks.
Personal Protective Equipment		
Eye and Face Protection	:	Sufficient eye protection should be worn. When handling compressed gas, at least glasses with side protection should be worn. When handling liquid gas, chemical safety goggles must be used as well as a protective shield.
Skin protection	:	Body protection: Use protective boots while handling gas cylinders. Hand protection: Wear leather gloves to prevent frostbite injuries from rapidly expanding gas when handling pressurized gas bottles.
Respiratory Protection	:	In an emergency (e.g.: unintentional release of the substance, exceeding the occupational exposure limit value) respiratory protection must be worn. Consider the maximum period for wear. Wear self- contained breathing apparatus. Do not use filter respirator.
Environmental exposure controls	:	Do not allow material to be released to the environment without the proper governmental permits.
Industrial Hygiene	:	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Avoid contact with skin and eyes. Avoid inhalation of vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Compressed liquefied gas.
Colour	:	Clear, colorless
Odour	:	Faint ether-like odour
pH	:	Neutral
Melting point	:	129.5°C (-201.1°F)
Boiling point	:	-16.5°C (2.5°F)
Relative Density	:	1.46 at 20°C
Vapour Density	:	6.04 (air = 1)
Vapour pressure	:	4,030 mm Hg at 21°C
Partition coefficient (n -octanol/water)	:	Log pow = 2.29
Solubility in water	:	Slightly in water.
Flash point	:	Do not flash
Critical Temperature	:	100.0°C
Critical Pressure	:	No data available
Flammability	:	Not flammable.
Decomposition temperature	:	No data available.
Explosive properties	:	No data available.
Oxidising properties	:	Non oxidizer.
Evaporation rate	:	No data available.
Viscosity	:	No data available.
GWP	:	3300
ODP	:	Non-Ozone Depleting
Molecular Weight	:	170.03 (g/mol)

10. STABILITY AND REACTIVITY

REACTIVITY: Stable under normal conditions

CHEMICAL STABILITY: Stable under normal conditions. The gaseous product in the presence of air can form, under certain conditions of temperature and pressure, a flammable mixture.

POSSIBILITY OF HAZARDOUS REACTIONS: No data is available on this product

CONDITIONS TO AVOID: Keep away from heat and sources of ignition. Avoid contact with flames and red hot metallic surfaces.

INCOMPATIBLE MATERIALS: Alkaline hydroxides, alkaline earth metals, strong oxidizing agents, finely divided metals.

HAZARDOUS DECOMPOSITION PRODUCT: Under normal conditions of storage and use, hazardous decomposition products should not be produced. At high temperature, thermal decomposition can give rise to toxic and corrosive products.

11. TOXICOLOGICAL INFORMATION

EYE : A short duration spray of vapor produced very slight eye irritation.

SKIN : Animal testing indicates this material is a slight skin irritant, but not a skin sensitizer.

INHALATION: Vapor is heavier than air. May displace oxygen and cause rapid suffocation. Exposure to high concentrations may cause an abnormal heart rhythm (arrhythmia) under stressful conditions which can be fatal. Very high atmospheric concentrations may cause anesthetic effects such as dizziness, drowsiness, headaches, and unconsciousness

CARCINOGENIC EFFECTS :

Not classified as carcinogenic by NTP, IARC, ACGIH, or OSHA.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data available

Persistence and degradability: This product is highly volatile and has low water solubility.

It will rapidly evaporate from water. Decomposes comparatively rapidly in the lower atmosphere (troposphere).

Atmospheric lifetime is 34.2 years.

Products of decomposition will be highly dispersed and hence will have a very low concentration. Practically non-biodegradable.

Bioaccumulative potential: Low given its Log Kow = 2.29


Mobility in soil: Expected to be mobile in soil.

Other adverse effects: Not a significant contributor to photochemical smog and is not considered to be a VOC. Is not considered an ozone-depleting chemical

13. DISPOSAL CONSIDERATIONS

Discarded product is not a hazardous waste under RCRA, 40 CFR 261. However, HFC-227ea should be recycled or reclaimed whenever possible

14. TRANSPORTATION INFORMATION

Hazard pictograms	:	
UN number	:	UN 3296
UN proper shipping name	:	Heptafluoropropane or Refrigerant Gas R 227ea
<u>ADR/RID</u>		
Class	:	2
Labels	:	2.2
Hazard No. (ADR)	:	20
Tunnel category	:	(C/E)
<u>IMDG</u>		
Class	:	2.2
EmS No.	:	F-C, S-V
<u>IATA</u>		
Class	:	2.2

15. REGULATORY INFORMATION

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

16. OTHER INFORMATION

This data sheet was prepared in accordance with Regulation (EC) No. 1907/2006

DISCLAIMER: The information recommendations and suggestions herein were compiled from reference material and sources believed to be reliable. This MSDS is not intended as a license to operate under or recommendation to infringe on any patents. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Data contained is based on a worst case condition of one of the constituents used in the refrigerant.

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