Safety Data Sheet R32

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	:	R32
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	:	Flammable Gas, Gas under pressure, Compressed Gas
HAZARD PICTOGRAM	:	
SIGNAL WORD	:	Danger
HAZARD STATEMENT	:	H220 - Extremely Flammable Gas; H280 - Contain gas under pressure, may explode if heated
SYMBOL	:	Flames, Gas Cylinder
PRECAUTIONARY STATEMENT	:	P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P377 – Leaking gas fire: Do not extinguish unless leak can be stopped safely. P381 – Eliminate all ignition sources if safe to do so P410+P403 – Protect from sunlight. Store in a well-ventilated place.
OTHER HAZARDS	:	Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

POTENTIAL HEALTH HAZARDS

SKIN: Skin contact with the rapidly evaporation liquid may cause frostbite. Frostbite effects are a change in color of the skin to grey or white, followed by blistering.

EYES: Eye Contact with the rapidly evaporation liquid my cause frostbite.

INHALATION: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Inhalation of high vapor concentration may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting, leading to unconsciousness, cardiac irregularities, or death.

INGESTION: Not an expected route of exposure.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	REACH Registration	EEC No.	% (w/w)	Classification according to 1272/2008 [CLP]
Difluoromethane (HFC 32)	75-10-5	01-2119471312-47	200-839-4	100%	Flam. Gas 1; H220 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: Move victim to fresh air. Keep warm and at rest. If breathing is labored, give oxygen. If only breathing has stopped, give artificial respiration with a pocket mask equipped with a on-way valve to prevent exposure to product or body fluids. If breathing has stopped and there is no pulse, give cardiopulmonary resuscitation (CPR). Get immediate medical attention.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media:

This product is extremely flammable. Appropriate extinguishing media are Water spray, Alcohol-resistant foam, Carbon dioxide (CO2) and Dry chemical

5.2 Special hazards arising from the Substance or Mixture:

Exposure to fire may cause containers to rupture/explode. If involved in a fire, toxic and/or corrosive fumes may be produced by thermal decomposition (gaseous hydrogen fluoride (HF), carbon oxides).

5.3 Advice for Fire Fighters:

If possible, stop flow of products. In case of fire nearby, remove exposed containers. Do not extinguish a leaking gas flame unless necessary. Fight fire remotely due to explosion risk. Cool containers / tanks with water spray. Spontaneous/explosive re-ignition may occur. Wear self-contained breathing apparatus and protective clothing. EN 469:2005: Protective Clothing for fire-fighters

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures :

Consider the risk of potentially explosive atmospheres. Evacuate personnel to a safe area. Ensure adequate ventilation of the working area. Wear selfcontained breathing apparatus when entering area unless atmosphere is proved to be safe. Eliminate all sources of ignition. Vapours are heavier than air. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.2 Environmental precautions :

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated water.

6.3 Methods and materials for containment and cleaning up :

Recovery: Allow to evaporate. Keep area free from ignition sources until any spilled material has evaporated (ground free from frost).

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

Segregate from oxidant gases and other oxidants in store. Keep container below 52°C. Keep container in a well-ventilated place. Keep away from sources of ignition – no smoking. Keep away from combustible material. All equipment in storage areas should be compatible with the risk of potentially explosive atmospheres. Containers should not be stored in conditions likely to encourage corrosion.

- 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 : Consider work permit system e.g. for maintenance activities. Ensure adequate ventilation of the working area. Product to be handled in a closed system.

Personal Protective Equipment

Eye and Face Protection : Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes

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	:	Slight ethereal
pH	:	Not available.
Melting point	:	-136°C
Boiling point	:	-51.7°C
Liquid Density	:	961 kg/cm3 at 0°C
Vapour Density	:	1.80 (Air = 1)
Vapour pressure	:	13.8 bar (20°C)
Partition coefficient (n -octanol/water)	:	Log pow = 0.21 (R32).
Solubility in water	:	Insoluble in water;
Flash point	:	No data available.
Critical Temperature	:	78.11°C
Critical Pressure	:	57.82 bar
Flammability	:	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	:	675
ODP	:	Non-Ozone Depleting
Molecular Weight	:	52.02 (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: Can form a potentially explosive atmosphere in air. May react violently with oxidants.

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

INCOMPATIBLE MATERIALS: Air. Strong oxidizing agents. Moisture. Alkali metals. Alkaline earth metals.

HAZARDOUS DECOMPOSITION PRODUCT: Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire, the following toxic and/or corrosive fumes may be produced by thermal decomposition: Hydrogen fluoride, CarbonylFluoride, Carbon Monoxide.

11. TOXICOLOGICAL INFORMATION

DIFLUOROMETHANE - Inhalation, followed by intravenous injection of epinephrine to simulate stress reactions, resulted in cardiac sensitization in dogs. Acute inhalation of high concentrations has produced an anesthetic effect in rats. Following repeated inhalation exposure, no adverse effects were observed in rats. No birth defects were noted in the offspring of rats or rabbits exposed by inhalation during pregnancy, even at dosages which produced significant adverse effects in the mother. No genetic changes were observed in standard tests using bacteria, animal cells or whole animals. Single exposure (acute) studies indicate: Inhalation - Practically Non-toxic to Rats (4-hr LC50 >520,000 ppm)

Avoid contact with strong alkali or alkaline earth metals, finely powdered metals such as aluminum, magnesium or zinc and strong oxidizers, since they may react or accelerate decomposition.

INCOMPATIBILITY:

Thermal decomposition products include hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide and chlorine.

12. ECOLOGICAL INFORMATION

ECO TOXICOLOGICAL INFORMATION:

Difluoromethane - The octanol/water partition coefficient (log POW) was 1.62 indicating a low bio concentration factor. In a 28-day ready biodegradability closed bottle test, it appeared to be stable.

CHEMICAL FATE INFORMATION:

No data are available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations.

> **NOTE:** Empty containers should be taken to an approved waste handling site for recycling or disposal. Empty pressure vessels should be returned to the supplier. Empty containers retain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death. If not otherwise specified: Dispose of as unused product.

WASTE TREAMENT METHOD:

Avoid discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharged to atmosphere. Dispose of in accordance with all local and national regulations. Dispose of container via supplier only. EWC code: 14 06 01* Chlorofluorocarbons, HCFC, HFC.

14. TRANSPORTATION INFORMATION

Hazard pictograms	:	
UN number	:	UN 3252
UN proper shipping name	:	LIQUEFIED GAS, N.O.S. (REFRIGERANT GAS R32) (Difluoromethane)
ADR/RID		
Class	:	2
Labels	:	2.1
Classification Code	:	2F
Hazard No. (ADR)	:	23
Tunnel category	:	(B/D)
Emergency action code	:	2YE
IMDG		
Class	:	2.1
EmS No.	:	F-D, S-U
IATA		
Class	:	2.1
Packing instruction	:	-
Packing group	:	P200

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

Text of Hazard Statements in Section 3
H280: Contains gas under pressure; may explode if heated.
H220: Extremely flammable gas
P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377 – Leaking gas fire: Do not extinguish unless leak can be stopped safely.
P381 – Eliminate all ignition sources if safe to do so
P410+P403 – Protect from sunlight. Store in a well-ventilated place.

Reference Materials - HSE publication EH40/2005 Workplace exposure limits (latest edition)

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