

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product identifier

Product Name Klea™ 32

Hazardous Ingredient(s) / Substance identity	REACH Registration No.
Difluoromethane (HFC 32)	01-2119471312-47-0002

Use Subject to Member State regulations, applicable uses are: refrigerant

Manufacturer Mexichem UK Limited
The Heath Business & Technical Park
Runcom
Cheshire
WA7 4QX
United Kingdom
Tel: +44(0) 1928 518880
E-Mail: info@mexichem.com

Emergency Phone No. IN AN EMERGENCY DIAL 999 (UK Only)
For specialist advice in an emergency telephone +44(0) 1928 572000

2. HAZARDS IDENTIFICATION

Flammable liquefied gas.
Low acute toxicity. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Liquid splashes or spray may cause freeze burns to skin and eyes.

Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP) Flam. Gas 1
Gases under pressure - Liquefied gas

Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Hazard Pictogram(s)



GHS02

GHS04

Signal Word(s) Danger

Hazard Statement(s) H220: Extremely flammable gas.
H280: Contains gas under pressure; may explode if heated.

Precautionary Statement(s) 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.

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Advice for firefighters

A self contained breathing apparatus and full protective clothing must be worn in fire conditions. See Also Section 8

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Ensure suitable personal protection (including respiratory protection) during removal of spillages. See Also Section 8
Environmental precautions	Prevent liquid from entering drains, sewers, basements and workpits since the vapour may create an explosive or suffocating atmosphere.
Methods and materials for containment and cleaning up	Eliminate sources of ignition. Provided it is safe to do so, isolate the source of the leak. Allow small spillages to evaporate provided there is adequate ventilation. Large spillages: Ventilate area. Contain spillages with sand, earth or any suitable adsorbent material. Prevent liquid from entering drains, sewers, basements and workpits since the vapour may create an explosive or suffocating atmosphere.
Reference to other sections	8,13

7. HANDLING AND STORAGE

Precautions for safe handling	<p>Keep away from sources of ignition - No Smoking. Take precautionary measures against static discharges.</p> <p>Avoid inhalation of high concentrations of vapours. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Atmospheric concentrations well below the occupational exposure limit can be achieved by good occupational hygiene practice.</p> <p>The vapour is heavier than air, high concentrations may be produced at low levels where general ventilation is poor, in such cases provide adequate ventilation or wear suitable respiratory protective equipment with positive air supply.</p> <p>Avoid contact between the liquid and skin and eyes.</p> <p>Avoid venting to atmosphere.</p> <p>The fluorinated greenhouse gas R 32 may be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases covered by the Kyoto Protocol. The fluorinated greenhouse gases in containers may not be vented to the atmosphere. Regulation (EU) No. 517/2014 of the European Parliament and the Council on certain fluorinated greenhouse gases.</p>
Process Hazards	<p>Liquid refrigerant transfers between refrigerant containers and to and from systems can result in static generation. Ensure adequate earthing. Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions.</p> <p>Care must be taken to mitigate the risk of developing high pressures in systems caused by a temperature rise when liquid is trapped between closed valves or in cases where containers have been overfilled.</p>
Conditions for safe storage, including any incompatibilities	<p>Keep in a well ventilated place away from fire risk and avoid sources of heat such as electric or steam radiators.</p> <p>Avoid storing near to the intake of air conditioning units, boiler units and open drains.</p>
Specific use	Subject to Member State regulations, applicable uses are: refrigerant

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure controls

Occupational Exposure Limits

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Occupational Exposure Limits	CAS No.	LTEL (8 hr TWA ppm)	LTEL 8 hr TWA mg/m ³	STEL (ppm)	STEL mg/m ³	Note
Difluoromethane (HFC 32)	000075-10-5	1000	-	-	-	COM

Appropriate engineering controls Provide adequate ventilation. Atmospheric levels should be controlled in compliance with the occupational exposure limit.

Personal protection equipment Wear suitable protective clothing, gloves and eye/face protection.



Respirators
In cases of insufficient ventilation, where exposure to high concentrations of vapour is possible, suitable respiratory protective equipment with positive air supply should be used.



Eye Protection
Wear protective eyewear (goggles, face shield, or safety glasses).



Gloves
Wear thermal insulating gloves when handling liquefied gases.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	liquefied gas
Colour.	colourless
Odour	slight ethereal
Solubility (Water)	insoluble
Boiling Point (° C)	-51.7
Melting Point (° C)	-136
Vapour Density (Air=1)	1.86 at normal boiling point
Vapour Pressure (mm Hg)	10319 at 20 ° C
Density (g/ml)	0.98 at 20 ° C
Flammable Limits (Upper) (%v/v)	31.0 ASTM 681-85
Flammable Limits (Lower) (%v/v)	14.0 ASTM 681-85

10. STABILITY AND REACTIVITY

Reactivity	See Section: Possibility of hazardous reactions
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Incompatible materials: finely divided metals , magnesium and alloys containing more than 2% magnesium . Can react violently if in contact with alkali metals and alkaline earth metals - sodium , potassium , barium . May react violently with oxidising agents.
Conditions to avoid	Keep away from heat and sources of ignition.
Incompatible materials	finely divided metals , alkali metals (sodium , potassium) , alkaline earth metals (barium , magnesium) , alloys containing more than 2% magnesium
Hazardous decomposition products	hydrogen fluoride by thermal decomposition and hydrolysis.

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11. TOXICOLOGICAL INFORMATION

Acute toxicity / Ingestion	Highly unlikely - but should this occur freeze burns will result.
Inhalation / Acute toxicity	LC50 (rat) (4 hrs) > 520000 ppm (1107600 mg/m ³) Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation. An inhalation study in dogs has shown that HFC 32, unlike analogous substances, does not cause cardiac sensitisation at concentrations up to 35% v/v.
Acute toxicity / Skin Contact	Unlikely to be hazardous by skin absorption.
Skin corrosion/irritation	Liquid splashes or spray may cause freeze burns.
Serious eye damage/irritation	Liquid splashes or spray may cause freeze burns.
Respiratory irritation	Non-irritant
Sensitisation	It is not a skin sensitiser.
Repeated dose toxicity	An inhalation study in animals has shown that repeated exposures produce no significant effects (49500ppm in rats).
Mutagenicity	No evidence of mutagenic effects.
Carcinogenicity	It is unlikely to present a carcinogenic hazard to man.
Reproductive toxicity	Studies in animals have shown that exposures produce no teratogenic effects.
Specific target organ toxicity — single exposure	Not classified.
Specific target organ toxicity — repeated exposure	Not classified.
Aspiration hazard	Not applicable.

12. ECOLOGICAL INFORMATION

Toxicity	The product is predicted to have low toxicity to aquatic organisms.
Environmental Fate and Distribution	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Gas.
Persistence and Degradation	Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 4.9 years. Products of decomposition will be highly dispersed and hence will have a very low concentration. Does not influence photochemical smog (i.e. is not a VOC under the terms of the UNECE agreement). Does not deplete ozone. Has a Global Warming Potential (GWP) of 675 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation (EU) No. 517/2014 on certain fluorinated greenhouse gases. Values in Annex I are taken from the fourth assessment report (AR4) of the Intergovernmental Panel on Climate Change. United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 650.
Bioaccumulative potential	The product has no potential for bioaccumulation.
Mobility in soil	Not applicable.
Results of PBT and vPvB assessment	Not classified as PBT or vPvB.

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Other adverse effects	None known.
Effect on Effluent Treatment	Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods	Best to recover and recycle. If this is not possible, destruction is to be in an approved facility which is equipped to absorb and neutralise acid gases and other toxic processing products.
Regulatory Information	Disposal should be in accordance with local, state or national legislation.

14. TRANSPORT INFORMATION

Forbidden for transport by passenger aircraft.
Hazard label(s)



Road/Rail	
UN No.	3252
ADR/RID Class	2.1
ADR/RID Proper Shipping Name	DIFLUOROMETHANE (REFRIGERANT GAS R 32)
SEA	
IMDG Class	2.1
Marine Pollutant	Not classified as a Marine Pollutant
AIR	
ICAO/IATA Class	2.1

15. REGULATORY INFORMATION

European Regulations

EC Classification	According to Regulation (EC) No. 1272/2008 (CLP) Flam. Gas 1 Gases under pressure - Liquefied gas
Special Restrictions:	The fluorinated greenhouse gas R 32 may be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases covered by the Kyoto Protocol. The fluorinated greenhouse gases in containers may not be vented to the atmosphere. Regulation (EU) No. 517/2014 of the European Parliament and the Council on certain fluorinated greenhouse gases. Directive 2006/40/EC of the European Parliament and the Council relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EC.

16. OTHER INFORMATION

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

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Glossary

WEL: Workplace Exposure Limit (UK HSE EH40)

COM: The company aims to control exposure in its workplace to this limit

TLV: The company aims to control exposure in its workplace to the ACGIH limit

TLV-C: The company aims to control exposure in its workplace to the ACGIH Ceiling limit

MAK: The company aims to control exposure in its workplace to the German limit

Sk: Can be absorbed through skin

Sen: Capable of causing respiratory sensitisation

Bmgv: Biological monitoring guidance value (UK HSE EH40)

Hazard Statement(s)

H220: Extremely flammable gas.

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

The following sections contain revisions or new statements:

1,2,4,5,6,7,8,10,11,12,13,15