ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	Klea™ 32
Chemical Name	Difluoromethane (HFC 32)
CAS No.	75-10-5
EC No.	200-839-4
REACH Registration No.	01-2119471312-47-0002

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	Subject to Member State regulations, applicable uses are: refrigerant.
Uses Advised Against	Not known.

1.3 Details of the supplier of the safety data sheet

Manufacturer	
Company Identification	Mexichem Fluor Japan Limited
Address of Manufacturer	Tennoz First Tower 2-4, Higashi-shinagawa 2-chome Shinagawa-ku, Tokyo JAPAN
Postal code	140-0002
Telephone:	+81-3-5462-8661
FAX:	+81-3-5462-8686

1.4 Emergency telephone number

Emergency Phone No.	For specialist advice in an emergency telephone +81-848-67-5232

SECTION 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.

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP)	Flam. Gas 1B :Flammable gas. Press. Gas (Liq.) :Contains gas under pressure; may explode if heated.

2.2 Label elements

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

Product Name: Klea™ 32

Hazard Pictogram(s)

GHS02

GHS04

Signal Word(s): Danger

Hazard Statement(s)	H221: 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: In case of leakage, eliminate all ignition sources. P403: Store in a well-ventilated place.

2.3 Other hazards

None known.

2.4 Additional Information

None.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Alternative names	Difluoromethane (HFC 32) R 32

3.1 Substances

HAZARDOUS INGREDIENT(S)	%W/W	CAS No.	EC No.	Hazard Pictogram(s) and Hazard Statement(s)
Difluoromethane (HFC 32)	100	75-10-5	200-839-4	GHS02 H221 GHS04 H280

3.2 Mixtures

Not applicable.

SECTION 4: FIRST AID MEASURES

The first aid advice given for skin contact, eye contact, and ingestion is applicable following exposures to the liquid or spray. See Also Section 11

4.1 Description of first aid measures

Inhalation	Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external cardiac massage. Obtain immediate medical attention.
Skin Contact	Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in the case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If irritation or blistering occur obtain medical attention.
Eye Contact	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention.
Ingestion	Unlikely route of exposure. Do not induce vomiting. Provided the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Obtain immediate medical attention.
Further Medical Treatment	Symptomatic treatment and supportive therapy as indicated.

4.2 Most important symptoms and effects, both acute and delayed

Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.

4.3 Indication of any immediate medical attention and special treatment needed

Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external cardiac massage. Obtain immediate medical attention.

SECTION 5: FIREFIGHTING MEASURES

The lower flammable limit of 14% v/v and the heat of combustion for HFC 32 are consistent with a class A2L classification (ASHREA Standard 34-2019: Number Designations and Safety Classification of Refrigerants). Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions.

5.1 Extinguishing media

Suitable Extinguishing media	Allow gas fires to burn until exhausted. Keep fire exposed containers cool by spraying with water.
Unsuitable extinguishing media	None.

5.2 Special hazards arising from the substance or mixture

Combustion or thermal decomposition will evolve very toxic and corrosive vapours. (hydrogen fluoride). Containers may burst if overheated.

5.3 Advice for firefighters

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

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Ensure suitable personal protection (including respiratory protection) during removal of spillages. See Also Section 8

6.2 Environmental precautions

Prevent liquid from entering drains, sewers, basements and workpits since the vapour may create an explosive or suffocating atmosphere.

6.3 Methods and material 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.

6.4 Reference to other sections

See Also Section 8, 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. 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. 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. Avoid contact between the liquid and skin and eyes.
Avoid venting to atmosphere.
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.

Process Hazards	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. 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.

7.2 Conditions for safe storage, including any incompatibilities

Keep in a well ventilated place away from fire risk and avoid sources of heat such as electric or steam radiators. Avoid storing near to the intake of air conditioning units, boiler units and open drains.

Storage temperature	Avoid high temperatures.
Storage life	Stable under normal conditions.
Incompatible materials	finely divided metals, alkali metals (sodium, potassium), alkaline earth metals (barium, magnesium), alloys containing more than 2% magnesium.

7.3 Specific end use(s)

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

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Difluoromethane (HFC 32)	75-10-5	1000				COM

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

8.2 Exposure controls

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

8.2.2. Personal protection equipment — Wear suitable protective clothing and eye/face protection.

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

Skin protection — Wear thermal insulating gloves when handling liquefied gases.

Respiratory protection — 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.

Thermal hazards — See above - Skin protection

8.2.3. Environmental Exposure Controls — Prevent liquid from entering drains, sewers, basements and workpits since the vapour may create an explosive or suffocating atmosphere.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Liquefied gas. Colour: Colourless.
Odour	Slight ethereal
Odour threshold	No information available.
pH	Not applicable.
Melting point/freezing point	-136°C
Initial boiling point and boiling range	-51.7°C
Flash Point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Flammable gas.
Upper/lower flammability or explosive limits	Flammable Limits (Upper) (%v/v): 31.0 ASTM 681-85 Flammable Limits (Lower) (%v/v): 14.0 ASTM 681-85
Vapour pressure	10319 mm Hg @ 20°C
Vapour Density (Air=1)	1.86 at normal boiling point
Density (g/ml)	0.98 @ 20°C

Relative density	No information available.
Solubility(ies)	Solubility (Water) : Insoluble.
	Solubility (Other) : No information available.
Partition coefficient: n-octanol/water	Log Pow = 0.21
Auto-ignition temperature	530°C
Decomposition Temperature (°C)	No information available.
Viscosity	Not applicable.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

9.2 Other information

None.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

See Section: Possibility of hazardous reactions

10.2 Chemical Stability

Stable under normal conditions.

10.3 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.

10.4 Conditions to avoid

Keep away from heat and sources of ignition.

10.5 Incompatible materials

finely divided metals, alkali metals (sodium, potassium), alkaline earth metals (barium, magnesium), alloys containing more than 2% magnesium.

10.6 Hazardous decomposition products

hydrogen fluoride by thermal decomposition and hydrolysis.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity - Ingestion	Highly unlikely - but should this occur freeze burns will result.
Acute toxicity - Skin Contact	Unlikely to be hazardous by skin absorption.
Acute toxicity - Inhalation	LC50 (rat) (4 hrs) > 520000 ppm (1107600 mg/m³)
	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.
Skin corrosion/irritation	Liquid splashes or spray may cause freeze burns.
Serious eye damage/irritation	Liquid splashes or spray may cause freeze burns.
Skin sensitization data	It is not a skin sensitiser.
Respiratory sensitization data	Not classified.

Germ cell 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.
Lactation	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Aspiration hazard	Not applicable.

11.2 Other information

Respiratory irritation	Non-irritant.
Repeated dose toxicity	An inhalation study in animals has shown that repeated exposures produce no significant effects (49500ppm in rats).

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

	The product is predicted to have low toxicity to aquatic organisms.
Toxicity - Aquatic invertebrates	Low toxicity to aquatic invertebrates.
Toxicity - Fish	Low toxicity to fish.
Toxicity - Algae	Low toxicity to algae.
Toxicity - Sediment Compartment	Not classified.
Toxicity - Terrestrial Compartment	Not classified.
Environmental Fate and Distribution	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Gas.

12.2 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.

12.3 Bioaccumulative potential

The product has no potential for bioaccumulation.

12.4 Mobility in soil

Not applicable.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6 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.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 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.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number

UN No.	3252

14.2 UN proper shipping name

UN proper shipping name	DIFLUOROMETHANE (REFRIGERANT GAS R 32)

14.3 Transport hazard class(es)

ADR/RID	
ADR/RID Class	2.1
IMDG	
IMDG Class	2.1
ICAO/IATA	
ICAO/IATA Class	2.1
Labels	

14.4 Packing group

Packing group	Not applicable.

14.5 Environmental hazards

Environmental hazards	Not classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user	Not known.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable.

SECTION 15: REGULATORY INFORMATION

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

European Regulations	
EC Classification	According to Regulation (EC) No. 1272/2008 (CLP) Flam. Gas 1B 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.

15.2 Chemical Safety Assessment

A REACH chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16

LEGEND

Hazard Statement(s)	H221: Flammable gas. H280: Contains gas under pressure; may explode if heated.
Acronyms	ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road CAS : Chemical Abstracts Service CLP : Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures EC : European Community IATA : International Air Transport Association IBC : Intermediate Bulk Container ICAO : International Civil Aviation Organization IMDG : International Maritime Dangerous Goods LTEL : Long term exposure limit PBT : Persistent, Bioaccumulative and Toxic REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals RID : Regulations concerning the International Carriage of Dangerous Goods by Rail STEL : Short term exposure limit STOT : Specific Target Organ Toxicity UN : United Nations vPvB : very Persistent and very Bioaccumulative
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