

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier**

Product Name Klea® 473A

CAS No. Not available.

EC No. Not available.

REACH Registration No. HFC 125: EU: 01-2119485636-25-0021
HFC 23: EU: 01-2119971823-29-0007
R-1132a: EU: 01-2119474211-48-0025

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 Koura
Address of Manufacturer Mexichem Fluor EU BV
Schiphol Boulevard 425
Schiphol
Netherlands
Postal code 1118 BK
Telephone: +32 623792874
E-mail info@kouraglobal.com

1.4 Emergency telephone number

Emergency Phone No. +44 (0) 1928 572000

SECTION 2: HAZARDS IDENTIFICATION

Low acute toxicity. Very high atmospheric concentrations may cause an abnormal heart rhythm, 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) Press. Gas (Liq.) :Contains gas under pressure; may explode if heated.

2.2 Label elements

Product Name According to Regulation (EC) No. 1272/2008 (CLP)
Klea® 473A

Hazard Pictogram(s)



GHS04

Signal Word(s)

Warning

Hazard Statement(s)

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

Precautionary Statement(s)

P410+P403: Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

None known.
Does not cause endocrine disruption.
Not classified as PBT or vPvB.

2.4 Additional information

None.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**3.1 Substances**

Not applicable.

3.2 Mixtures

HAZARDOUS INGREDIENT(S)	%W/W	CAS No.	EC No.	Hazard Pictogram(s) and Hazard Statement(s)
Pentafluoroethane (HFC 125)	10	354-33-6	206-557-8	GHS04 H280
1,1-Difluoroethylene (R-1132a, Vinylidene Fluoride)	20	75-38-7	200-867-7	GHS02 H220 GHS04 H280
Carbon dioxide	60	124-38-9	204-696-9	GHS04 H280

Trifluoromethane (HFC 23)	10	75-46-7	200-872-4	GHS04 H280
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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. Adrenaline and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

4.2 Most important symptoms and effects, both acute and delayed

None anticipated.

4.3 Indication of any immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

Non-flammable.

5.1 Extinguishing media

Suitable Extinguishing media

As appropriate for surrounding fire.

Keep fire exposed containers cool by spraying with water.

Unsuitable extinguishing media

None.

5.2 Special hazards arising from the substance or mixture

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 a suffocating atmosphere.

6.3 Methods and material for containment and cleaning up

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 a suffocating atmosphere.

6.4 Reference to other sections

See Also Section 8, 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

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 with naked flames and hot surfaces as corrosive and very toxic decomposition products can be formed. Avoid contact between the liquid and skin and eyes.

Process Hazards	Liquid refrigerant transfers between refrigerant containers and to and from systems can result in static generation. Ensure adequate earthing. 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.	LTTEL (8 hr TWA ppm)	LTTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Pentafluoroethane (HFC 125)	354-33-6	1000				COM
1,1-Difluoroethylene (R-1132a, Vinylidene Fluoride)	75-38-7	500				ACGIH TLV
Carbon dioxide	124-38-9	5000	9150	15000	27400	
Trifluoromethane (HFC 23)	75-46-7	1000				COM

Region	Source
EU	EU Occupational Exposure Limits
United Kingdom	UK Workplace Exposure Limits EH40/2005 (Fourth edition, published 2020)
	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.

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 a suffocating atmosphere.
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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Supercritical compressed gas @ 29.5°C Colour: Colourless.
Odour	Odourless.
Odour threshold	No information available.
pH	Not applicable.
Melting point/freezing point	No information available.
Initial boiling point and boiling range	-87.7 – -83.0°C
Flash Point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Non-flammable.
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	38403 mm Hg @ 20°C
Vapour density	1.81 @ 20°C
Density (g/ml)	No information available.
Relative density	No information available.
Solubility(ies)	Solubility (Water) : Insoluble. Solubility (Other) : Soluble in: Alcohols, Chlorinated solvents, esters.
Partition coefficient: n-octanol/water	No information available.
Auto-ignition temperature	No information available.
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

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.

10.4 Conditions to avoid

Avoid high temperatures.

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	Very high atmospheric concentrations may cause an abnormal heart rhythm, anaesthetic effects and asphyxiation.
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	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	No evidence of reproductive effects.
Lactation	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Aspiration hazard	Not applicable.

11.2 Other information

Long Term Exposure HFC 125: An inhalation study in animals has shown that repeated exposures

Product Name: Klea® 473A Revision: GHS02 Date: 11/2023 Page: 5 of 6

produce no significant effects (50000ppm in rats).
 R-1132a: Repeated exposure to levels well above the occupational exposure limit may produce adverse effects on the liver.
 HFC 23: An inhalation study in animals has shown that repeated exposures produce no significant effects (10000ppm in rats).
 R-473A: Does not cause endocrine disruption.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity - Aquatic invertebrates
 Toxicity - Fish
 Toxicity - Algae
 Toxicity - Sediment Compartment
 Toxicity - Terrestrial Compartment
 Environmental Fate and Distribution

The product is predicted to have low toxicity to aquatic organisms.
 Low toxicity to aquatic invertebrates.
 Low toxicity to fish.
 Low toxicity to algae.
 Not classified.
 Not classified.
 Gas.

12.2 Persistence and Degradation

Does not deplete ozone. Has a Global Warming Potential (GWP) of 1831 (relative to a value of 1 for carbon dioxide at 100 years).

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 Endocrine disrupting properties

Does not cause endocrine disruption.

12.7 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. 3163

14.2 UN proper shipping name

UN proper shipping name LIQUEFIED GAS, N.O.S. (PENTAFLUOROETHANE, 1,1-DIFLUOROETHYLENE, CARBON DIOXIDE, TRIFLUOROMETHANE MIXTURE)

14.3 Transport hazard class(es)

ADR/RID 2.2

ADR/RID Class 2.2

IMDG 2.2

IMDG Class 2.2

ICAO/IATA

ICAO/IATA Class 2.2

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)

Gases under pressure - liquefied gas

Special Restrictions:

Regulation (EU) No. 517/2014 of the European Parliament and the Council on certain fluorinated greenhouse gases.

15.2 Chemical Safety Assessment

A chemical safety assessment is not required under REACH.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1,2,11,12

LEGEND

Hazard Statement(s)

H220: Extremely 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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