SAFETY DATA SHEET

Mexichem.

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

Product Name **Klea™ 404A**

Hazardous Ingredient(s)	REACH Registration No.
1,1,1-Trifluoroethane (HFC 143a)	01-2119492869-13-0003
Pentafluoroethane (HFC 125)	01-2119486636-25-0005
1,1,1,2-tetrafluoroethane (HFC 134a)	01-2119459374-33-0000

Manufacturer

Mexichem UK Limited
The Heath Business & Technical Park
Runcorn
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

Use

Subject to Member State regulations, applicable uses are: refrigerant

2. HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Liquid splashes or spray may cause freeze burns to skin and eyes.

EC Classification

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

GHS Label elements

Signal Word(s) Warning

Hazard Pictogram(s)

GHS04

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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Alternative names R 404A

HAZARDOUS INGREDIENT(S)

Hazardous Ingredient(s)	%(w/w)	CAS No.	EC No.	Hazard symbol(s) and hazard statement(s)
1,1,1,2-tetrafluoroethane (HFC 134a)	100	000811-97-2	212-377-0	GHS04 H280

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

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.

5. FIREFIGHTING MEASURES

General

HFC 134a is not flammable in air under ambient conditions of temperature and pressure. Certain mixtures of HFC 134a and air when under pressure may be flammable. Mixtures of HFC 134a and air under pressure should be avoided.
Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours. (hydrogen fluoride)
Containers may burst if overheated.

Extinguishing media

As appropriate for surrounding fire.
Keep fire exposed containers cool by spraying with water.

Fire Fighting Protective Equipment

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

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

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

General

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.

7. HANDLING AND STORAGE

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.
For correct refrigerant composition, systems should be charged using the liquid phase and not the vapour phase.

Avoid venting to atmosphere.

The fluorinated greenhouse gas R 407C 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 (EC) No. 842/2006 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.

Storage

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.

Specific use

Subject to Member State regulations, applicable uses are: refrigerant

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General

Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases.
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

Gloves

Occupational Exposure Limits

Occupational Exposure Limits	CAS No.	LTEL (8 hr TWA ppm)	LTEL 8 hr TWA mg/m³	STEL (ppm)	STEL mg/m³	Note
Difluoromethane (HFC 32)	000075-10-5	1000	-	-	-	COM
Pentafluoroethane (HFC 125)	000354-33-6	1000	-	-	-	COM
1,1,1,2-Tetrafluoroethane (HFC 134a)	000811-97-2	1000	4240	-	-	WEL

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	liquefied gas
Colour	colourless
Odour	slight ethereal
Solubility (Water)	insoluble
Solubility (Other)	Soluble in: alcohols , chlorinated solvents , esters
Boiling Point (° C)	-44.3 to -37.1 (boiling range)
Vapour Density (Air=1)	3.0 at bubble point temperature
Vapour Pressure (mm Hg)	7810 at 20 ° C
Density (g/ml)	1.16 at 20 ° C

10. STABILITY AND REACTIVITY

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
Hazardous Decomposition Product(s)	hydrogen fluoride by thermal decomposition and hydrolysis.

11. TOXICOLOGICAL INFORMATION

Inhalation	High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Skin Contact	Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.
Eye Contact	Liquid splashes or spray may cause freeze burns.
Ingestion	Highly unlikely - but should this occur freeze burns will result.
Long Term Exposure	HFC 32 : An inhalation study in animals has shown that repeated exposures produce no significant effects (49500ppm in rats). HFC 125 : An inhalation study in animals has shown that repeated exposures produce no significant effects (50000ppm in rats). HFC 134a : A lifetime inhalation study in rats has shown that exposure to 50000ppm resulted in benign tumours of the testis. The increased tumour incidence was observed only after prolonged exposure to high levels, and is considered not to be of relevance to humans occupationally exposed to HFC 134a at or below the occupational exposure limit.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Vapour

Effect on Effluent Treatment

Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

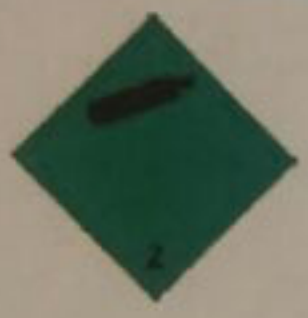
13. DISPOSAL CONSIDERATIONS

Recommended:

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.

14. TRANSPORT INFORMATION

Hazard label(s)



Road/Rail	
UN No.	3163
ADR/RID Class	2.2
ADR/RID Proper Shipping Name	LIQUEFIED GAS, N.O.S. (DIFLUOROMETHANE, PENTAFLUOROETHANE)
SEA	
IMDG Class	2.2
Marine Pollutant	Not classified as a Marine Pollutant
AIR	
ICAO/IATA Class	2.2

15. REGULATORY INFORMATION

European Regulations

EC Classification	Regulation (EC) No. 1272/2008 (CLP) Gases under pressure - Liquefied gas
Special Restrictions:	The fluorinated greenhouse gas R 410A 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 (EC) No. 842/2006 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

SAFETY DATA SHEET

Mexichem.

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

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)

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

The following sections contain revisions or new statements: 1,2,3,15,16

SAFETY DATA SHEET

Mexichem.

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

Product Name

Klea™ 134a

REACH Registration No.

01-2119459374-33-0000

Manufacturer

Mexichem UK Limited
The Heath Business & Technical Park
Runcorn
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

Use

Subject to Member State regulations, applicable uses are: refrigerant , blowing agent , propellant , solvent

2. HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Liquid splashes or spray may cause freeze burns to skin and eyes.

EC Classification

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

Gases under pressure - Liquefied gas

Label elements

Hazard Statement(s)

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

Signal Word(s)

Warning

Hazard Pictogram(s)

GHS04

Precautionary Statement(s)

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

Alternative names

1,1,1,2-tetrafluoroethane (HFC 134a)
R 134a

HAZARDOUS INGREDIENT(S)

Ingredient(s)	%(w/w)	CAS No.	EC No.	EC Classification
1,1,1-Trifluoroethane (HFC 143a)	52	000420-46-2	206-996-5	GHS02, GHS04; H220, H280
Pentafluoroethane (HFC 125)	44	000354-33-6	206-557-8	GHS04; H280
1,1,1,2-tetrafluoroethane (HFC 134a)	4	000811-97-2	212-377-0	GHS04; H280

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.

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.

5. FIREFIGHTING MEASURES

General

This refrigerant is not flammable in air under ambient conditions of temperature and pressure. Certain mixtures of this refrigerant and air when under pressure may be flammable. Mixtures of this refrigerant and air under pressure should be avoided.
Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours. (hydrogen fluoride)
Containers may burst if overheated.

Extinguishing media

As appropriate for surrounding fire.
Keep fire exposed containers cool by spraying with water.

Fire Fighting Protective Equipment

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

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

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

General

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.

7. HANDLING AND STORAGE

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.

Avoid venting to atmosphere.

The fluorinated greenhouse gas R 134a 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 (EC) No. 842/2006 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.

Storage

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.

Specific use

Subject to Member State regulations, applicable uses are: refrigerant , blowing agent , propellant , solvent

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General

Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases.
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

Gloves

Occupational Exposure Limits

Occupational Exposure Limits	CAS No.	LTEL (8 hr TWA ppm)	LTEL 8 hr TWA mg/m³	STEL (ppm)	STEL mg/m³	Note
1,1,1,2-Tetrafluoroethane (HFC 134a)	000811-97-2	1000	4240	-	-	WEL

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	liquefied gas
Colour.	colourless
Odour	slight ethereal
Solubility (Water)	insoluble
Solubility (Other)	Soluble in: alcohols , chlorinated solvents , esters
Boiling Point (° C)	-47.2 to -46.4 (boiling range)
Vapour Density (Air=1)	3.42 at bubble point temperature
Vapour Pressure (mm Hg)	8270 at 20 ° C
Density (g/ml)	1.06 at 20 ° C

10. STABILITY AND REACTIVITY

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
Hazardous Decomposition Product(s)	hydrogen fluoride by thermal decomposition and hydrolysis.

11. TOXICOLOGICAL INFORMATION

Inhalation	High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Skin Contact	Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.
Eye Contact	Liquid splashes or spray may cause freeze burns.
Ingestion	Highly unlikely - but should this occur freeze burns will result.
Long Term Exposure	HFC 143a : An inhalation study in animals has shown that repeated exposures produce no significant effects (40000ppm in rats). HFC 125 : An inhalation study in animals has shown that repeated exposures produce no significant effects (50000ppm in rats). HFC 134a : A lifetime inhalation study in rats has shown that exposure to 50000ppm resulted in benign tumours of the testis. The increased tumour incidence was observed only after prolonged exposure to high levels, and is considered not to be of relevance to humans occupationally exposed to HFC 134a at or below the occupational exposure limit.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Vapour

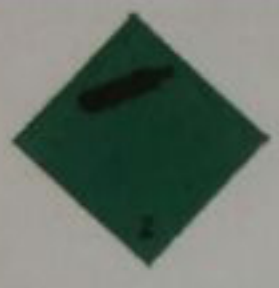
Effect on Effluent Treatment	Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. DISPOSAL CONSIDERATIONS

Recommended:	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.

14. TRANSPORT INFORMATION

Hazard label(s)



Road/Rail	
UN No.	3159
ADR/RID Class	2.2
ADR/RID Proper Shipping Name	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)
SEA	
IMDG Class	2.2
Marine Pollutant	Not classified as a Marine Pollutant
AIR	
ICAO/IATA Class	2.2

15. REGULATORY INFORMATION

European Regulations

EC Classification	According to Regulation (EC) No. 1272/2008 (CLP) Gases under pressure - Liquefied gas
Special Restrictions:	The fluorinated greenhouse gas R 134a 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 (EC) No. 842/2006 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

SAFETY DATA SHEET

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

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: 1,15,16

SAFETY DATA SHEET

Mexichem.

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

Product Name **Klea™ 407C**

Hazardous Ingredient(s)	REACH Registration No.
Difluoromethane (HFC 32)	01-2119471312-47-0002
Pentafluoroethane (HFC 125)	01-2119485636-25-0005
1,1,1,2-tetrafluoroethane (HFC 134a)	01-2119459374-33-0000

Manufacturer

Mexichem UK Limited
The Heath Business & Technical Park
Runcorn
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

Use

Subject to Member State regulations, applicable uses are: refrigerant

2. HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Liquid splashes or spray may cause freeze burns to skin and eyes.

EC Classification

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

Gases under pressure - Liquefied gas

GHS Label elements

Signal Word(s)

Warning

Hazard Pictogram(s)

GHS04

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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Alternative names

R 407C

HAZARDOUS INGREDIENT(S)

Ingredient(s)	%(w/w)	CAS No.	EC No.	EC Classification
Difluoromethane (HFC 32)	50	000075-10-5	200-839-4	GHS02, GHS04; H220, H280
Pentafluoroethane (HFC 125)	50	000354-33-6	206-557-8	GHS04; H280

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.

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.

5. FIREFIGHTING MEASURES

General

This refrigerant is not flammable in air under ambient conditions of temperature and pressure. Certain mixtures of this refrigerant and air when under pressure may be flammable. Mixtures of this refrigerant and air under pressure should be avoided.
Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours. (hydrogen fluoride)
Containers may burst if overheated.

Extinguishing media

As appropriate for surrounding fire.
Keep fire exposed containers cool by spraying with water.

Fire Fighting Protective Equipment

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

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

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

General

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.

7. HANDLING AND STORAGE

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.
For correct refrigerant composition, systems should be charged using the liquid phase and not the vapour phase.

Avoid venting to atmosphere.

The fluorinated greenhouse gas R 410A 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 (EC) No. 842/2006 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.

Storage

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.

Specific use

Subject to Member State regulations, applicable uses are: refrigerant

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General

Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases.
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

Gloves

Occupational Exposure Limits

Occupational Exposure Limits	CAS No.	LTEL (8 hr TWA ppm)	LTEL 8 hr TWA mg/m³	STEL (ppm)	STEL mg/m³	Note
Difluoromethane (HFC 32)	000075-10-5	1000	-	-	-	COM
Pentafluoroethane (HFC 125)	000354-33-6	1000	-	-	-	COM

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	liquefied gas
Colour.	colourless
Odour	slight ethereal
Solubility (Water)	insoluble
Solubility (Other)	Soluble in: alcohols , chlorinated solvents , esters
Boiling Point (° C)	-51.8 to -51.9 (boiling range)
Vapour Density (Air=1)	2.6 at bubble point temperature
Vapour Pressure (mm Hg)	10880 at 20 ° C
Density (g/ml)	1.09 at 20 ° C

10. STABILITY AND REACTIVITY

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
Hazardous Decomposition Product(s)	hydrogen fluoride by thermal decomposition and hydrolysis.

11. TOXICOLOGICAL INFORMATION

Inhalation	High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Skin Contact	Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.
Eye Contact	Liquid splashes or spray may cause freeze burns.
Ingestion	Highly unlikely - but should this occur freeze burns will result.
Long Term Exposure	HFC 32 : An inhalation study in animals has shown that repeated exposures produce no significant effects (49500ppm in rats). HFC 125 : An inhalation study in animals has shown that repeated exposures produce no significant effects (50000ppm in rats).

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Vapour
Persistence and Degradation	HFC 32 : Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 4.9 years. HFC 125 : Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 29 years. R 410A: 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 1975 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex I are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values). United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 1725.

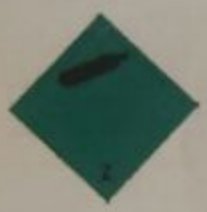
Persistence and Degradation	HFC 32 : Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 4.9 years. HFC 125 : Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 29 years. HFC 134a : Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 14 years. R 407C: 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 1653 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex I are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values). United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 1526.
Effect on Effluent Treatment	Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. DISPOSAL CONSIDERATIONS

Recommended:	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.

14. TRANSPORT INFORMATION

Hazard label(s)



Road/Rail UN No. ADR/RID Class ADR/RID Proper Shipping Name	 3340 2.2 REFRIGERANT GAS R 407C
SEA IMDG Class Marine Pollutant	 2.2 Not classified as a Marine Pollutant
AIR ICAO/IATA Class	 2.2

15. REGULATORY INFORMATION

European Regulations

EC Classification	According to Regulation (EC) No. 1272/2008 (CLP) Gases under pressure - Liquefied gas

Special Restrictions:	The fluorinated greenhouse gas R 407C 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 (EC) No. 842/2006 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.

Information in this publication is believed to be accurate and is given in good faith, but it is for the User to satisfy itself of the suitability for its own particular purpose. Accordingly, Mexichem UK Limited gives no warranty as to the fitness of the Product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that such exclusion is prevented by law. Freedom under Patent, Copyright and Designs cannot be assumed.
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Mexichem UK Limited is Registered in England No 7088219. Registered Office The Heath Business & Technical Park, Runcorn, Cheshire WA7 4QX.

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: 1,15,16

SAFETY DATA SHEET

Mexichem.

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

Product Name **Klea™ 410A**

Hazardous Ingredient(s)	REACH Registration No.
Difluoromethane (HFC 32)	01-2119471312-47-0002
Pentafluoroethane (HFC 125)	01-2119485636-25-0005

Manufacturer

Mexichem UK Limited
The Heath Business & Technical Park
Runcorn
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

Use

Subject to Member State regulations, applicable uses are: refrigerant

2. HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Liquid splashes or spray may cause freeze burns to skin and eyes.

EC Classification

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

Gases under pressure - Liquefied gas

GHS Label elements

Signal Word(s)

Warning

Hazard Pictogram(s)

GHS04

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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Alternative names

R 410A

HAZARDOUS INGREDIENT(S)

Ingredient(s)	%(w/w)	CAS No.	EC No.	EC Classification
Difluoromethane (HFC 32)	23	000075-10-5	200-839-4	GHS02, GHS04; H220, H280
Pentafluoroethane (HFC 125)	25	000354-33-6	206-557-8	GHS04; H280
1,1,1,2-tetrafluoroethane (HFC 134a)	52	000811-97-2	212-377-0	GHS04; H280

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.

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.

5. FIREFIGHTING MEASURES

General

This refrigerant is not flammable in air under ambient conditions of temperature and pressure. Certain mixtures of this refrigerant and air when under pressure may be flammable. Mixtures of this refrigerant and air under pressure should be avoided.
Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours. (hydrogen fluoride)
Containers may burst if overheated.

Extinguishing media

As appropriate for surrounding fire.
Keep fire exposed containers cool by spraying with water.

Fire Fighting Protective Equipment

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

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

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

General

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.

7. HANDLING AND STORAGE

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.
For correct refrigerant composition, systems should be charged using the liquid phase and not the vapour phase.

Avoid venting to atmosphere.

The fluorinated greenhouse gas R 404A 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 (EC) No. 842/2006 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.

Storage

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.

Specific use

Subject to Member State regulations, applicable uses are: refrigerant

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General

Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases.
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

Gloves

Occupational Exposure Limits

Occupational Exposure Limits	CAS No.	LTEL (8 hr TWA ppm)	LTEL 8 hr TWA mg/m³	STEL (ppm)	STEL mg/m³	Note
1,1,1-Trifluoroethane (HFC 143a)	000420-46-2	1000	-	-	-	COM
Pentafluoroethane (HFC 125)	000354-33-6	1000	-	-	-	COM
1,1,1,2-Tetrafluoroethane (HFC 134a)	000811-97-2	1000	4240	-	-	WEL

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	liquefied gas
Colour	colourless
Odour	slight ethereal
Solubility (Water)	slightly soluble
Solubility (Other)	Soluble in: alcohols , chlorinated solvents , polyethylene glycol
Boiling Point (° C)	-26.2
Melting Point (° C)	-101
Vapour Density (Air=1)	3.66 at normal boiling point
Vapour Pressure (mm Hg)	4270 at 20 ° C
Specific Gravity	1.22 at 20 ° C

10. STABILITY AND REACTIVITY

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
Hazardous Decomposition Product(s)	hydrogen fluoride by thermal decomposition and hydrolysis.

11. TOXICOLOGICAL INFORMATION

Inhalation	LC50 (rat) (4 hrs) > 500000 ppm (2080000 mg/m3) High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.
Skin Contact	Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.
Eye Contact	Liquid splashes or spray may cause freeze burns.
Ingestion	Highly unlikely - but should this occur freeze burns will result.
Long Term Exposure	A lifetime inhalation study in rats has shown that exposure to 50000ppm resulted in benign tumours of the testis. The increased tumour incidence was observed only after prolonged exposure to high levels, and is considered not to be of relevance to humans occupationally exposed to HFC 134a at or below the occupational exposure limit.

12. ECOLOGICAL INFORMATION

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 14 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 1300 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex I are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values). United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 1300.

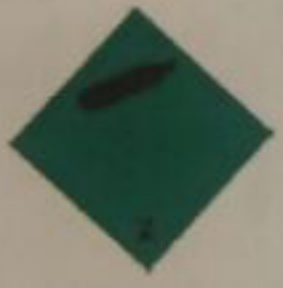
Persistence and Degradation	HFC 143a : Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 52 years. HFC 125 : Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 29 years. HFC 134a : Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 14 years. R 404A: 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 3784 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex I are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values). United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 3260.
Effect on Effluent Treatment	Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. DISPOSAL CONSIDERATIONS

Recommended:	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.

14. TRANSPORT INFORMATION

Hazard label(s)



Road/Rail UN No. ADR/RID Class ADR/RID Proper Shipping Name	 3337 2.2 REFRIGERANT GAS R 404A
SEA IMDG Class Marine Pollutant	2.2 Not classified as a Marine Pollutant
AIR ICAO/IATA Class	2.2

15. REGULATORY INFORMATION

European Regulations

EC Classification	According to Regulation (EC) No. 1272/2008 (CLP) Gases under pressure - Liquefied gas

Special Restrictions:

The fluorinated greenhouse gas R 404A 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 (EC) No. 842/2006 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.

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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: 1,15,16