

MATERIAL SAFETY DATA SHEET

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	Revision: 1.02	Date: 04/08

01 - IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

PRODUCT NAME	HARP® 407D
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02 - HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause abnormal heart rhythm and prove suddenly fatal. 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.

03 - COMPOSITION/INFORMATION ON INGREDIENTS

EEC No.: HFC 32:- 200-839-4, HFC134a:- 212-377-0, HFC125:- 206-557-8,

HAZARDOUS INGREDIENT(S)	CAS No.	% (w/w)	Symbol	R Phrases
Difluoromethane (HFC 32)	000075-10-5	15	F+	R12
Pentafluoroethane (HFC 125)	000354-33-6	15		
1,1,1,2-Tetrafluoroethane (HFC 134a)	000811-97-2	70		

04 - 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 eye wash 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 pint) of water to drink. Obtain immediate medical attention.

Further Medical Treatment

Symptomatic treatment and supportive therapy as indicated. Adrenalin an similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

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05 - FIRE-FIGHTING MEASURES

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. Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Combustion or thermal decomposition will evolve very toxic and corrosive vapours (hydrogen fluoride)

Extinguishing Media:

Allow gas fires to burn until exhausted.
Water spray should be used to cool containers.

Fire Fighting Protective Equipment:

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

06 - ACCIDENTAL RELEASE MEASURES

Ensure personal protection (including respiratory protection) during removal of spillages. See also Section 8.
Provided it is safe to do so, isolate the source of the leak. Allow small spillages to evaporate provide 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 work pits since the vapour may create a suffocating atmosphere.

07 - HANDLING AND STORAGE

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 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 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.

Storage

Keep in a well ventilated place. Keep in a cool place away from fire risk, direct sunlight and all sources of heat such as electric and steam radiators.
Avoid storing near to the intake of air conditioning units, boiler units and open drains.
Cylinders and drums:
Keep container dry.
Storage temperature <45°C.

08 - EXPOSURE CONTROLS/PERSONAL PROTECTION

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.

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Occupational Exposure Limits

HAZARDOUS INGREDIENT(S)	LTEL 8hr TWA ppm	LTEL 8hr TWA mg/m³	STEL ppm	STEL mg/m³	Notes
Difluoromethane (HFC 32)	1000	-	-	-	COM
Pentafluoroethane (HFC 125)	1000	-	-	-	COM
1,1,1,2-Tetrafluoroethane (HFC 134a)	1000	4240	-	-	OES

09 - PHYSICAL AND CHEMICAL PROPERTIES

Form:	liquefied gas
Colour:	colourless
Odour:	ether-like (slightly)
Boiling point:	-39.8°C to -33.1°C (boiling range)
Vapour Pressure:	6600 mm Hg at 20°C
Density (g/ml):	1.18 at 20°C
Solubility (Water):	insoluble
Solubility (Other):	soluble in: chlorinated solvents, alcohols, esters
Vapour density (Air = 1):	3.1 approx, at bubble point temperature

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, alkaline earth metals- sodium, potassium, barium. May react violently with: oxidising agents.
Hazardous Decomposition Products:	hydrogen chloride, hydrogen fluoride by decomposition and hydrolysis.

11 - TOXICOLOGICAL INFORMATION

Inhalation

High exposures may cause abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause an abnormal heart rhythm 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 (49,500ppm in rats).

HFC 125: An inhalation study in animals has shown that repeated exposures produce no significant effects (50,000ppm in rats).

HFC 134a: A lifetime study in rats has shown that exposures to 50,000ppm resulted in benign tumours of the testes. 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 limit.

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12 - ECOLOGICAL INFORMATION

Environmental Fate and Distribution

High tonnage material produced in wholly 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 5.6 year(s)

Has a Global Warming Potential (GWP) of 650 (relative to 1 for carbon dioxide at 100 years).

HFC 125: Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 32.6 year(s)

Has a Global Warming Potential (GWP) of 2800 (relative to 1 for carbon dioxide at 100 years).

HFC 134a: Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 13.6 year(s)

Has a Global Warming Potential (GWP) of 1300 (relative to 1 for carbon dioxide at 100 years).

HFC 32, HFC 125, HFC 134a: Does not influence photochemical smog (i.e. is not a VOC under terms of the UNECE agreement).

Effect on Effluent Treatment

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

13 - DISPOSAL CONSIDERATIONS

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

UN No: 1078

AIR

ICAO/IATA

-primary: 2.2

SEA

IMDG

-primary: 2.2

Marine Pollutant: Not classified as a marine pollutant

Proper Shipping Name: REFRIGERANT GAS N.O.S (PENTAFLUOROETHANE, DIFLUOROMETHANE, 1,1,1,2-TETRAFLUOROETHANE)

ROAD/RAIL

ADR/RID Class: 2

ADR Sin: 1078

15 - REGULATORY INFORMATION

Not classified as dangerous to users.

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16 – OTHER INFORMATION

This data sheet was prepared in accordance with Directive 2001/58/EC.

This information contained within this safety data sheet applies only to the Harp International Limited product to which it relates. The information provided is based upon our best knowledge at the time that this safety data sheet was published.

The information is believed to be accurate and is given in all good faith.

When used in other preparations, in formulations or in mixtures, it is necessary to ascertain if the classification of the hazards have changed. The attention of users is drawn to the possibility of creating other hazards when the product is used for purposes other than that for which it is recommended. In such cases a complete reassessment should be made by user.

This safety data sheet should only be used and reproduced in order that the necessary measures may be taken relating to the protection of health and safety at work and relating to the protection of environment.

The reference to the legislative, regulatory and codes of practice documents must not be considered as exhaustive.

It is the responsibility of handlers of the product to pass on the totality of the information contained within this document to any subsequent persons who will come into contact with, handle or use the product in any way.

They should check the adequacy of the information contained in the safety data sheet received before passing it onto their customers.

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