MATERIAL SAFETY DATA SHEET

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

PRODUCT NAME HARP® 408A

SUPPLIER

Harp International Limited
Gellihirion Industrial Estate
Pontypridd
Rhondda Cynon Taff
CF37 5SX
United Kingdom

Telephone: +44 (0) 1443 842255
Fax: +44 (0) 1443 841805

Email: harp@harpintl.com

EMERGENCY TELEPHONE NUMBER: +44 (0) 1270 502891 (24 HOUR)

02 - HAZARDS IDENTIFICATION

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.
Dangerous for the ozone layer.

03 - COMPOSITION/INFORMATION ON INGREDIENTS

EEC No.: HCFC 22:- 200-871-9, HFC 125:- 206-557-8, HFC 143a:- 206-996-5

HAZARDOUS INGREDIENT(S)	CAS No.	% (w/w)	Symbol	R Phrases
Chlorodifluoromethane (HCFC 22)	000075-45-6	47	-	R59
Pentafluoroethane (HFC 125)	000354-33-6	7		
1,1,1-Trifluoroethane (HFC 143a)	000420-46-2	46	F+	R12

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.

MATERIAL SAFETY DATA SHEET

05 - FIRE-FIGHTING MEASURES

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

Extinguishing Media:	As appropriate for surrounding fire. 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 o 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
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 an 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 HFC/HCFC 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.

MATERIAL SAFETY DATA SHEET

Occupational Exposure Limits

HAZARDOUS INGREDIENT(S)	LTEL 8hr TWA ppm	LTEL 8hr TWA mg/m^3	STEL ppm	STEL mg/m^3	Notes
Chlorodifluoromethane (HCFC 22)	1000	3950	-	-	OES
Pentafluoroethane (HFC 125)	1000	-	-	-	COM
1,1,1-Trifluoroethane (HFC 143a)	1000	-	-	-	COM

09 - PHYSICAL AND CHEMICAL PROPERTIES

Form:	liquefied gas
Colour	colourless
Odour	ether-like (slightly)
Boiling point:	-44.5°C
Vapour Pressure	8850 mm Hg at 20°C
Density (g/ml):	1.038 at 25°C
Solubility (Water)	insoluble
Solubility (Other)	Soluble in chlorinated solvents, alcohols and esters
Critical Temperature:	83°C
Vapour Density (Air = 1)	3.03 approximately

10 - STABILITY AND REACTIVITY

Hazardous Reactions:	Certain mixtures of HFC/HCFC 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.
Hazardous Decomposition Products:	hydrogen chloride, hydrogen fluoride by 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
HCFC 22: A lifetime inhalation study in animals has shown that high exposures of HCFC 22 (50,000ppm), produces a small excess of salivary gland tumours in male rats. Female rats and both sexes of mice showed no such response. The no effect level was 10,000ppm. This information does not suggest that HCFC 22 represents a carcinogenic hazard to humans under normal conditions of handling and use. Studies in animals have shown that high exposures of HCFC 22 produce a low incidence of teratogenic effects in rats, but not in rabbits at the same exposure level (49,000ppm). The low incidence of effects in rats, the high exposure level associated with its occurrence and the absence of an effect in rabbits, leads to the conclusion that these results are not of significance when considering the health of humans occupationally exposed the levels of HCFC 22 at or below the occupational exposure limit.

HFC 125: An inhalation study in rats has shown that repeated exposures to 50,000ppm, produces no significant effects.
HFC 143a: An inhalation study in rats has shown that repeated exposures to 40,000ppm, produces no significant effect.

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
HCFC 22: Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 11.8 year(s). 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). Ozone depleting potential (ODP) is 0.055 measured against a standard ODP of 1 for CFC 11 (as defined by UNEP).
Has a Global Warming Potential (GWP) of 1500 (relative to a value of 1 for carbon dioxide at 100 years).
Substance controlled under the Montreal Protocol (1992 revision).
HCFC 125: Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 32.6 year(s).
Does not deplete ozone. Has a Global Warming Potential (GWP) of 2800 (relative to a value of 1 for carbon dioxide at 100 years). Does not influence photochemical smog (i.e. is not a VOC under the terms of the UNECE agreement).
HFC 143a: Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 48 year(s).
Does not deplete ozone. Has a Global Warming Potential (GWP) of 3800 (relative to a value of 1 for carbon dioxide at 100 years). Does not influence photochemical smog (i.e. is not a VOC under the 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. (CHLORODIFLUOROMETHANE, PENTAFLUOROETHANE, 1,1,1-TRIFLUOROETHANE)
ROAD/RAIL	
ADR/RID Class:	2
ADR Sin:	1078

MATERIAL SAFETY DATA SHEET

15 - REGULATORY INFORMATION

EC Classification:	DANGEROUS FOR THE ENVIRONMENT
Risk Phrases:	R59 Dangerous for the ozone layer.
Safety Phrases:	S59 Refer to manufacturer/supplier for information on recycling/recovery.

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.

End of document