SAFETY DATA SHEET

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

PRODUCT NAME	HARP® 123
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
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02 - COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME OF THE SUBSTANCE	2,2-DICHLORO-1,1,1-TRIFLUOROETHANE
GENERIC NAME	HALOGENATED HYDROCARBON
CAS	306-83-2
EINECS	206-190-3

03 - HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS	-
HEALTH EFFECTS	Repeated excessive exposure can cause harmful effects on the liver.
ENVIRONMENTAL EFFECTS	Dangerous for the ozone layer.
PHYSICAL AND CHEMICAL HAZARDS	Thermal decomposition giving toxic and corrosive products.
SPECIFIC HAZARDS/EC	Dangerous to the ozone layer.

04 - FIRST AID MEASURES

INHALATION	Inhalation of vapours: Move to fresh air. Oxygen or artificial respiration if needed. Keep under medical surveillance. In case of problems: Hospitalise.
SKIN CONTACT	Wash immediately, abundantly and thoroughly with water. Frostbite: treat as thermal burns.
EYE CONTACT	Wash immediately, abundantly and thoroughly with water. If irritation persists, consult an ophthalmologist.
INGESTION	If the subject is unconscious, do not induce vomiting. Hospitalise.
PROTECTION OF FIRST-AIDERS	Confined space: Risk of hypoxia. In case of insufficient ventilation, wear self-contained breathing apparatus.
INFORMATION FOR DOCTORS	Do not administer catecholamines (because of the cardiac effect of the product)

05 - FIRE-FIGHTING MEASURES

SPECIFIC HAZARDS	Thermal decomposition into chlorinated and fluorinated toxic and corrosive products: Hydrogen fluoride Hydrogen chloride Phosgene Oxides of carbon.
SPECIFIC METHODS	Cool containers/tanks with water spray. Prohibit all sources of sparks and ignition - Do not smoke.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS	Wear self-contained breathing apparatus and protective suit.

06 - ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION	Avoid contact with skin and eyes. Prevent inhalation of vapours. Wear personal protective equipment. In enclosed areas: ventilate or wear self-contained breathing apparatus (risk of anoxia). Remove all sources of ignition. Do not smoke.
ENVIRONMENTAL PROTECTION	Do not release into the environment. Do not let product enter drains. Contain by damming.
METHODS FOR CLEAN UP	-
Recovery	Pump into an inert labelled emergency container.
Disposal	Consult Harp International Limited.

07 - HANDLING AND STORAGE

HANDLING	-
Technical measures/Precautions	Storage and handling precautions applicable to products: LIQUID Ensure appropriate exhaust and ventilation at machinery. Well ventilate empty vats and tanks before entering. Provide showers, eye-baths.
Safe handling advice	Prohibit ignition sources and contact with hot surfaces - DO NOT SMOKE Open drums carefully as contents may be under pressure.
STORAGE	-
Technical measures/Storage conditions	Store at room temperature in the original container. Keep away from naked flames, hot surfaces and sources of ignition. Keep in a cool, well ventilated place, (below 50°C). Protect full containers from sources of heat to avoid over-pressurisation. Store in specially reinforced drums, hermetically sealed with bungs. Provide a catch tank in a bunded area.
PACKAGING MATERIALS	-
Recommended	Ordinary steel.
Not recommended	Alloys containing more than 2% of magnesium Light metals and alloys in the presence of moisture, including parts of the installation in contact with the product. (Beryllium, Zinc, Aluminium). Plastic materials

08 - EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE PROVISIONS	Provide sufficient air exchange and/or exhaust in work areas.
CONTROL PARAMETERS	-
Exposure limits	No UK HSE EH/40 values set. VME = 10 ppm, 62.5mg/m^3
PERSONAL PROTECTION EQUIPMENT	-
Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment.
Hand protection	Gloves.
Eye protection	Safety glasses.
Skin and body protection	Protective clothing.
Specific hygiene measures	Avoid contact with skin and eyes. Prohibit inhalation of vapours. Do not smoke.

09 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20°C)	liquid
COLOUR	colourless
ODOUR	ether-like (slightly)
pH	not applicable
BOILING POINT/RANGE	27.6°C
MELTING POINT/RANGE	-107°C
FLASH POINT	No flash point (in the test conditions)
VAPOUR PRESSURE	(25°C): 0.91bar (50°C): 2.06 bar
VAPOUR DENSITY	(30°C): 6.69 kg/m^3
LIQUID DENSITY	(24°C): 1465 kg/m^3
SOLUBILITY	Solubility of product in water at 20°C = 1.1 g/l
PARTITION COEFFICIENT (n-octal/water)	log P_{ow} = 2.82
OTHER DATA	Critical temperature: T_c = 185.2°C Solubility of water in this product at 20°C: 5.94% in weight.

10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID	Keep away from heat and sources of ignition. Do not expose to temperatures above 50°C Avoid contact with flames and red hot metallic surfaces
HAZARDOUS DECOMPOSITION PRODUCTS	Thermal decomposition into chlorinated and fluorinated toxic and corrosive products: Hydrogen fluoride (hydrofluoric acid) Hydrogen chloride gas Phosgene Oxides of carbon
FURTHER INFORMATION	The product is stable under normal handling and storage conditions.

11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY	-
Inhalation	Effects of breathing high concentrations of vapour may include: Headache, sleepiness and dizziness.

	Confined space: As with other volatile aliphatic halogenated compounds, through vapour accumulation and/or inhalation of large quantities, the product can cause: Loss of consciousness and cardiac disorders aggravated by stress and lack of oxygen: risk of mortality. Experimental effects on animals: Practically not harmful by inhalation. LC50/inhalation/4h/rat = 200 mg/m^3
Ingestion	Experimental effects on animals: Practically not harmful if swallowed. LD50/oral/rat> 5 g/kg.
Skin contact	Experimental effects on animals: Practically not harmful in contact with skin. No mortality in rat at 2 g/kg.
LOCAL EFFECTS	-
Skin-contact	Rapid evaporation of the liquid may cause frostbite. Experimental effects on animals: non irritating to skin (rabbit)
Eye-contact`	Experimental effects on animals: slightly irritating to eyes (rabbit).
SENSITISATION	-
Skin-contact	Experimental effects on animals: not a skin sensitiser (guinea pig).
CHRONIC TOXICITY	Cases of liver poisoning have been reported in man. Experimental effects on animals: Target organs at high concentrations Central nervous system, liver, metabolism of lipids Maximum concentration with no systemic effect: inhalation/2 year/rat < 1.8 mg/l.
SPECIFIC EFFECTS	GENOTOXICITY: According to available experimental data: overall not genotoxic CARCINOGENICITY: Experimentation on animals of different species has not shown clear evidence of carcinogenic effect. (inhalation/2 years/rat) REPRODUCTIVE TOXICITY: Fertility: According to available experimental data: absence of toxic effects on fertility. (inhalation/rat) Foetal development: Experimental effects on animals: Absence of toxic effects for foetal development (at non toxic concentrations for mothers). (inhalation/rat,rabbit).

12 - ECOLOGICAL INFORMATION

MOBILITY	Rapid evaporation: half-life time $t_{½}$ = 3.6 hours (estimated)
PERSISTENCE/DEGRADABILITY	-
In air	Degradation in the tropoosphere: half-life time $t_{½}$ = 1.6 years Ozone depletion potential: ODP (R-11 = 1.0) = 0.02 Halocarbon global warming potential: HGWP (R-11 = 1.0) = 0.017 - 0.02
In soils and sediments	Slight adsorption: log K_{oc} = 2.6

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BIOACCUMULATION	Slightly bioaccumulable: log P_{ow} = 2.82
ECOTOXICITY	-
AQUATIC TOXICITY	-
Acute toxicity	Harmful to daphnia: EC50, 48h = 45.8 mg/l Fish: No effect concentration, 96 h (Pimephales promelas) = 175 mg/l

13 - DISPOSAL CONSIDERATIONS

DISPOSAL OF PRODUCT	Recycle or incinerate at an approved site only

14 - TRANSPORT INFORMATION

ADR/RID	Not regulated
IMDG	Not regulated
IATA	Not regulated

15 - REGULATORY INFORMATION

EEC DIRECTIVE	-
SAFETY DATA SHEETS	D.91/155/EEC amended by D.93/112/EEC: Dangerous substances and preparations
EC CLASSIFICATION/LABELLING	-
HAZARDOUS SUBSTANCES	D.67/548/EEC amended by D.93/21/EEC - Labelling guide (18th. ATP) R59 Dangerous for the ozone layer S59 Refer to manufacturer/supplier for information on recovery/recycling S61 Avoid release to the environment. Refer to special instructions/safety data sheet
EEC Nr (EINECS)	206-190-3
SUBSTANCES DAMAGING TO THE OZONE LAYER	EC Regulation No. 3093/94 of 15/12/94
BRITISH REGULATION SAFETY DATA SHEET	Chip2: Chemical (Hazard Information and Packaging for Supply) Regulations1994, SI No. 3247
CLASSIFICATION/LABELLING	-
INVENTORIES	TSCA (USA): listed DSL (Canada): listed ENCS (Japan): 2-97 AICS (Australia): listed ECL (Korea): 2-258 PICCS (Philippines): listed

16 - OTHER INFORMATION

RECOMMENDED USES	Refrigerant, blowing agent, aerosol propellant

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NOTE

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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