SAFETY DATA SHEET

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

PRODUCT NAME	HARP® 12
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	DICHLORODIFLUOROMETHANE
GENERIC NAME	HALOGENATED HYDROCARBON
CAS	75-71-8
EINECS	200-893-9

03 - HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS	-
HEALTH EFFECTS	Practically non harmful
PHYSICAL AND CHEMICAL HAZARDS	Thermal decomposition giving toxic and corrosive products
SPECIFIC HAZARDS/EEC	DANGEROUS FOR THE ENVIRONMENT Dangerous to the ozone layer

04 - FIRST AID MEASURES

INHALATION	Move to fresh air. Oxygen or artificial respiration if needed. In case of persistant problems: Consult a doctor.
SKIN CONTACT	Wash immediately and abundantly with water. Frostbite: treat as thermal burns.
EYE CONTACT	Wash immediately, abundantly and thoroughly with water. If irritation persists, consult an ophthalmologist.
PROTECION OF FIRST AIDERS	If entering a saturated atmosphere, wear self-contained breathing apparatus.
INFORMATION FOR DOCTORS	Do not administer catecholamines (because of the cardiac effect caused by the product).

05 - FIRE-FIGHTING MEASURES

SPECIFIC HAZARDS	Thermal decomposition into chlorinated and fluorinated toxic and corrosive products: Hydrogen fluoride Hydrogen chloride gas 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 and 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

07 - HANDLING AND STORAGE

HANDLING	-
Technical measures/Precautions	Storage and handling precautions applicable to products: LIQUEFIED GAS UNDER PRESSURE Provide for appropriate exhaust ventilation at machinery. Provide showers, eye-baths.
Safe handling advice	Avoid ignition sources and contact with hot surfaces - DO NOT SMOKE
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. Protect full containers from sources of heat to avoid over-pressurisation.
PACKAGING MATERIALS	-
Recommended	Ordinary or stainless steel, aluminium.
Prohibited	Alloys containing more than 2% of magnesium Plastic materials

08 - EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE PROVISIONS	Provide sufficient air exchange and/or exhaust in work areas.
CONTROL PARAMETERS	-
Exposure limits	UK HSE EH40/99: Long-term exposure limit (8-hour TWA reference period) = 1000ppm, 5030 mg/m^3 Short- term exposure limit (15 min. reference period) = 1250ppm, 6280 mg/m^3 FRANCE 1999: VME = 1000ppm (4950 mg/m^3) USA-ACGIH 1998: TLV-TWA = 1000ppm = 4950 mg/m^3
PERSONAL PROTECTION EQUIPMENT	-
Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment
Hand protection	Gloves
Eye protection	Safety glasses
Specific hygiene measures	Avoid contact with skin and eyes and inhalation of vapours

09 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20°C)	gaseous
COLOUR	colourless
ODOUR	ether-like (slightly)
pH	not applicable
BOILING POINT/RANGE	-29.8°C
MELTING POINT/RANGE	-158.0°C
DECOMPOSITION TEMPERATURE	500.0°C
FLASH POINT	No flash point (in the test conditions)
VAPOUR PRESSURE	(25°C): 0.65 MPa (6.5 bar) (50°C): 1.22 MPa (12.2 bar) (70°C): 1.89 MPa (18.9 bar)
VAPOUR DENSITY AT BOILING POINT	6.33 kg/m^3
LIQUID DENSITY	(25°C): 1311 kg/m^3 (50°C): 1211 kg/m^3 (70°C): 1115 kg/m^3
SOLUBILITY	Soluble in hydrocarbons and chlorinated solvents, alcohols, ketones and esters. Solubility of product in water at 25°C = 0.009% by weight
PARTITION COEFFICIENT	log P_{ow} = 2.2
OTHER DATA	Critical temperature: T_c = 112°C Critical pressure: P_c = 4.11 MPa (41.1 bar) Henry's constant: 0.23E5 Pa m^3/mole

10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID	Keep away from heat and sources of ignition 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 may include: Headache, sleepiness, dizziness As with other volatile aliphatic halogenated compounds through vapour accumulation and/or inhalation in large quantities: 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>800000ppm (4g/l)

LOCAL EFFECTS	-
Inhalation	Vapour at high concentrations: Risk of irritation of vresiratory system.
Skin-contact	Ejection of liquefied gas: frostbite possible.
Eye-contact	Ejection of liquefied gas: frostbite possible. Possible irritation of eyes. Superficial lesion of cornea. Possible temporary conjunctivitis.
CHRONIC TOXICITY	
SPECIFIC EFFECTS	GENOTOXICITY: According to available experimental data: Not genotoxic. CARCINOGENICITY: Absence of carcinogenic effects (rat/mouse/inhalation) REPRODUCTIVE TOXICITY: Foetal development: Experimental effects on animals: Absence ofcongenital malformations and embryotoxic toxic at non toxic concentration for mothers. (rat – rabbit / inhalation)

12 - ECOLOGICAL INFORMATION

MOBILITY	Rapid evaporation: half-life time $t_{½}$ = 3.2 hours (calculated).
PERSISTENCE/DEGRADABILITY	-
In air	Slow degradation in the atmosphere by OH radical: half-life time $t_{½}$ = 80.5 years. Ozone depletion potential: ODP (R-11 = 1.0) = 1.0 Halocarbon global warming potential: HGWP (R-11 = 1.0) = 3.0
BIOACCUMULATION	Slightly bioaccumulable: log P_{ow} = 2.2 (measured).
ECOTOXICITY	-
AQUATIC TOXICITY	-
Acute toxicity	Harmful to fish: LC50, 48h (Oryzias latipes) = 67 mg/l. Bacteria under anaerobic conditions (domestic waste water): Toxicity threshold > 120 mg/l.

13 - DISPOSAL CONSIDERATIONS

DISPOSAL OF PACKAGING	Return all sized containers to supplier.
DISPOSAL OF PRODUCT	Recycle or incinerate at an approved site only.

14 - TRANSPORT INFORMATION

CONSULT HRPR FOR FURTHER INFORMATION	
UN Number	1028
ADR/RID	Class: 2 Item (letter): 2°A
Prescriptions	Labels: 2 H.I. Nr/U.N. Nr: 20/1028
IMDG	Class: 2.2 UN Nr (IMDG): 1028
Prescriptions	Labels: 2.2

IATA	Class: 2.2
	UN Nr (IMDG): 1028
Prescriptions	Labels: 2.2

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)
	N DANGEROUS FOR THE ENVIRONMENT.
	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.
EC No. (EINECS)	200-893-9
SUBSTANCES DAMAGING TO THE OZONE LAYER	EC Regulation No. 3093/94 of 15/12/94
BRITISH REGULATION	-
SAFETY DATA SHEET	CHIP2: Chemicals (Hazard Information and Packaging for Supply) Regulations 1994, SI No. 3247
CLASSIFICATION/LABELLING	-
INVENTORIES	EINECS (200-893-9)
	TSCA (USA): listed
	DSL (Canada): listed
	AICS (Australia): listed
	ENCS (Japan): 2-50
	ECL (Korea): KE-10106
	PICCS (The Philippines): listed

16 - OTHER INFORMATION

RECOMMENDED USES	Refrigerant
BIBLIOGRAPHY REFERENCES	Encyclopédie des gaz (Air Liquide - Ed. 1976 - Elsevier Amsterdam)
	Fiche toxicologique INRS: No. 135 dichlorodifluoromethane

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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