Material Safety Data Sheet
(REFRIGERANT R417A)

Information in this format is provided as a service to our customers and is intended only for their use. Others may use it at their own discretion and risk. This information is based upon technical information we believes to be reliable. It is subject to revision as additional knowledge and experience are gained. Please return to this website for the most current version.

R-417A

IDENTIFICATION OF THE SUBSTANCE/ PREPARATION

AND THE COMPANY/UNDERTAKING

Material Identification

Corporate MSDS Number: YH000818

CAS Name: R-417A

COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NATURE OF THE PREPARATION	MIXTURE BASED ON:	
	R600 (ISOBUTANE)	CAS: 106-97-8
	R125 (PENTAFLUOROETNANE)	CAS: 354-33-6
	R134a (1,1,1,2-TETRAFLUOROETHANE)	CAS: 811-97-2

HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS	-
PHYSICAL AND CHEMICAL HAZARDS	Thermal decomposition giving toxic and corrosive products.

FIRST AID MEASURES

GENERAL ADVICE	-
INHALATION	Move to fresh air. Oxygen or artificial respiration if needed. In case of persistent problems: Consult a doctor.
SKIN CONTACT	Frostbite: treat as thermal burns.
EYE CONTACT	Wash immediately, abundantly and thoroughly with water. If irritation persists, consult an ophthalmologist.
PROTECTION OF FIRST-AIDERS	In case of insufficient ventilation, wear suitable respiratory equipment.
INFORMATION FOR DOCTORS	Do not administer catecholamines (because of the cardiac effect caused by the product.)

FIRE FIGHTING MEASURES

SPECIFIC HAZARDS	Thermal decomposition giving toxic and corrosive products. Hydrogen fluoride Carbon oxides One of the components of this preparation gives flammable mixtures with air.
SPECIFIC METHODS	Cool containers/tanks with water spay. Prohibit all sources of sparks and ignition-Do not smoke.
SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS	Wear a self-contained breathing apparatus and protective suit.

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 a self-contained breathing apparatus (risk of anoxia). Do not smoke.
ENVIRONMENT PROTECTION	Minimize as much as possible discharge into the environment.

HANDLING AND STORAGE

Technical measures /Precautions	Storage and handling precautions applicable to products: GAS UNDER PRESSURE. Ensure appropriate exhaust and ventilation at machinery.
Safe handling advice	Prohibit ignition sources and contact with hot surfaces-DO NOT SMOKE.
Technical measures /Storage conditions	Store at ambient 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 overpressurization.
Recommended	Ordinary steel.
To be avoid	Alloys containing more than 2% of magnesium. Plastic materials.

EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE PROVISIONS	Ensure sufficient air exchange and/or exhaust in work areas.
CONTROL PARAMETHERS	-
Exposure Limits	R-134a VME=1000ppm R600 VME=1000ppm R125 VME=1000ppm
PERSONAL PROTECTION EQUIPMENT	-
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Hand protection	Gloves
Eye protection	Safety glasses.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20℃)	Refrigerant gas N.O.S
COLOUR	colourless
ODOUR	Slightly ether-like
pH	Not applicable
BOILING POINT/RANGE	-38.0℃
FLASH POINT	No flash point (in the test conditions)
VAPOR PRESSURE	(25℃): 1.13MPa (11.3bar) (50℃): 2.11MPa (21.1bar) (70℃): 3.26Mpa (32.6bar)
VAPOUR DENSITY	At the boiling point: 4.54kg/m3
DENSITY	(25℃): 1133kg/m3 (50℃): 1004kg/m3 (70℃): 861kg/m3
PARTITION CONEFFICIENT (noctanol/water)	log Pow=0.21(R32)-log Pow=1.48(R125)-log Pow=1.06(R134a)
OTHER DATA	R134a: Does not dissociate in water. Critical temperature: 89℃ Critical pressure: 4.64MPa

STABILITY AND REACTIVITY

CONDITIONS TO AVOID	Avoid contact with flames and red hot metallic surfaces.
HAZARDOUS DECOMPOSITION PRODUCTS	Thermal decomposition into toxic products containing fluorine. Hydrogen fluoride (hydrofluoric acid) Carbon oxides.
FURTHER INFORMATION	The product is stable under normal handling and storage conditions.

TOXICOLOGICAL INFORMATION

ACUTE TOXICITY	-
Inhalation	Experimental effects on animals: FORANE 134a, FORANE 600, FORANE 125 Practically not harmful by inhalation. No mortality in rat at 500000ppm/4h. 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.
LOCAL EFFECTS	-
Skin-contact	Ejection of liquefied gas: frostbite possible.
CHRONIC TOXICITY	FORANE 134a, FORANE 600, FORANE 125 Studies of prolonged inhalation in animals have not shown sub-chronic toxic effects. (rat/3 months/Inhalation: 50000ppm)
SPECIFIC EFFECTS	
GENOTOXICITY	According to available experimental data: FORANE 134a, FORANE 600, FORANE 125: Not: genotoxic.
CARCINOGENICITY	FORANE 134a Experimentation on animals has not shown clear evidence of carcinogenic effect. (rat/Inhalation ¨ oral route
REPRODUCITIVE TOXICITY	
	Foetal development: R134a, R600, R125 According to available experiment data: Absence of toxic effects for foetal development (Inhalation/rat-rabbit) Fertility: According to limited available data in animals: FORANE 134a Absence of toxic effects on fertility (mouse/Inhalation)

ECOLOGICAL INFORMATION

-SUBSTANCE CONCERNED	FORANE 600
PERSISTENCE/DEGRADABILITY	-
In water	Not readily biodegradable: 5%after 28d
BIOACCUMULATION	Practically not bioaccumulable: log Pow =0.21(measured)
-SUBSTANCE CONCERNED	FORANE 125
MOBILITY	Rapid evaporation: t1/2 life= 3.2h (estimated)
PRESISTENCE/DEGRADBILITY	-
In water	Not readily biodegradable 5% after 28d
In air	Degradation in the troposphere: t1/2 life= 28.3y (estimated) Ozone depletion potential: ODP (R11=1) =0 Global warming potential (GWP): (HGWP) =0.58
In soils and sediments	Slight adsorption: log Koc= 1.3-1.7
BIOACCUMULATION	Practically not bioaccumulable: log Koc=1.48
-SUBSTANCE CONCERNED	FORANE 134a
MOBOLITY	Rapid evaporation；t1/2 life= 3h(estimated)
PERSISTENCE/DEGRADABILITY	-
In water	Not readily biodegradable: 3% after 28d
In air	Degradation in the atmosphere: 3% after 28d Ozone depletion potential: ODP(R-11=1)= 0 Global warming potential (GWP)= 0.26
BIOACCUMULATION	Practically not bioaccumulable: log Pow= 1.06

DISPOSAL CONSIDERATIONS

DISPOSAL OF PRODUCT	Recycle or incinerate at an approved waste disposal site only.

TRANSPORTATION INFORMATION

UN Number	1078
ADR/RID	Class: 2.2 Item (letter): 2¡A
Prescriptions	Labels: 2 H.I. Nr/ID Nr: 20/3340
IMDG	Class: 2.2 UN Nr (IMDG): 3340
Prescriptions	Labels: 2.2
IATA	Class: 2.2 UN Nr (IATA) or ID Nr: 3340
Prescriptions	Labels: 2.2

REGULATORY INFORMATION

EEC DIRECTIVE	-
SAFETY DATA SHEETS	D.91/155/EEC amended by D.93/112/EEC: Dangerous substances and preparations
EC CLASSIFICATION/LABELLING	-
DANGEROUS PREPARATIONS	D.88/379/EEC amended by D.93/18/EEC (3rd ATP) Not classified as dangerous
SUBSTANCE DAMAGING TO THE OZONE LAYER	EC Regulation N¡ 3093/94 of 15.12.94
INVENTORIES	EINECS (EU): conforms TSCA (USA): conforms

OTHER INFORMATION

RECOMMENDED USES	Refrigerant

In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear.
The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress.
Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes.
The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive.
It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product.
It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

End of MSDS