

Infosafe No™	4AC25	Issue Date : October 2007	ISSUED by ARKEMA
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CS: 1.4.18

 Product Name : **FORANE 22**

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

<b>Product Name</b>	FORANE 22
<b>Company Name</b>	ARKEMA PTY LTD (ABN 44 000 330 772)
<b>Address</b>	Ground Floor, 600 Victoria Street Richmond Victoria 3121 Australia
<b>Telephone/Fax Number</b>	Tel: 03 9425 7777 Fax: 03 9425 7799
<b>Recommended Use</b>	Low temperature refrigerant. Air conditioning.
<b>Other Information</b>	<p>24 HOUR EMERGENCY RESPONSE:            AUSTRALIA (toll free): 1800 033 111    NZ Freecall (toll free): 0800 734 607            International:            + 61 3 9663 2130</p>

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## 2. HAZARDS IDENTIFICATION

<b>Hazard Classification</b>	DANGEROUS GOODS. NON-HAZARDOUS SUBSTANCE.
<b>Risk Phrase(s)</b>	Dangerous goods classification according to the Australian Dangerous Goods Code. Hazard classification according to the criteria of NOHSC. R59 Dangerous for the ozone layer.
<b>Safety Phrase(s)</b>	S59 Refer to manufacturer/supplier for information on recovery/recycling. S61 Avoid release to the environment. Refer to special instructions/safety data sheet.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

<b>Chemical Characterization</b>	Gas		
<b>Ingredients</b>	<u>Name</u>	<u>CAS</u>	<u>Proportion</u>
	Chlorodifluoromethane	75-45-6	100 %

## 4. FIRST AID MEASURES

<b>Inhalation</b>	Remove the source of contamination or move the victim to fresh air. Ensure airways are clear and have qualified person give oxygen through a face mask if breathing is difficult. If symptoms develop, seek medical attention.
<b>Ingestion</b>	Unlikely to occur due to the physical state of the product, as product is a gas at ambient temperature. However, if ingestion of liquified gas occurs, treat as thermal burns. Seek immediate medical attention.
<b>Skin</b>	Wash affected area thoroughly with soap and water. Remove contaminated clothing and wash before reuse or discard. If symptoms develop seek medical attention. If contact with ejected liquified gas occurs , frostbite: treat as thermal burns. Seek immediate medical attention.
<b>Eye</b>	If contact with the eye(s) occurs, wash with copious amounts of water holding eyelid(s) open. Take care not to rinse contaminated water into the non-affected eye. If symptoms develop seek medical attention. If contact with ejected liquified gas occurs, frostbite: treat as thermal burns. Seek immediate medical attention.
<b>First Aid Facilities</b>	Eyewash and normal washroom facilities.
<b>Advice to Doctor</b>	Treat symptomatically.

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**Protection for First Aiders** If entering a saturated atmosphere, wear a self contained breathing apparatus.

## 5. FIRE FIGHTING MEASURES

<b>Suitable Extinguishing Media</b>	Use appropriate fire extinguisher for surrounding environment.
<b>Hazards from Combustion Products</b>	Under fire conditions this product may emit toxic and/or irritating fumes including hydrogen chloride gas, hydrogen fluoride, phosgene and carbon oxides.
<b>Specific Hazards</b>	This product is not flammable in air under ambient conditions of temperature and pressure. The decomposition products can burn if exposed to fire. Some mixtures of HFCs and air oxygen may be combustible if pressurised and exposed to extreme heat or flame. In case of fire, remove exposed containers (hazards of over pressurization in containers exposed to heat: explosion risk).
<b>Hazchem Code</b>	2RE
<b>Decomposition Temp.</b>	480°C
<b>Precautions in connection with Fire</b>	Fire-fighters should wear full protective clothing and self contained breathing apparatus (SCBA) operated in positive pressure mode.

## 6. ACCIDENTAL RELEASE MEASURES

<b>Emergency Procedures</b>	Increase ventilation. Disperse gas with floor-level force air ventilation, extraction. Evacuate all unnecessary personnel. Avoid contact with the skin and eyes. Wear protective clothing to minimise skin and eye exposure. In enclosed areas: wear a self-contained breathing apparatus (risk of anoxia). In high concentrations, can act as an asphyxiant. Avoid inhalation of vapours. Extinguish or remove all sources of ignition. Stop leak if safe to do so. Use water spray/fog to reduce gas cloud from serious leak or spill. Isolate area until gas has been dispersed.
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## 7. HANDLING AND STORAGE

<b>Precautions for Safe Handling</b>	Use in a well ventilated area. DO NOT store or use in confined spaces. Do not enter these areas without respiratory protection or until the atmosphere has been checked. Do not use near welding or other ignition sources and avoid sparks. Post 'No smoking' signs in area of use. Do not pressurise, cut, heat or weld aerosol containers. It is essential that all who come into contact with this material maintain high standards of personal hygiene ie. washing hands prior to eating, drinking, smoking or using toilet facilities.
<b>Conditions for Safe Storage</b>	Store in a cool, dry, well-ventilated area and out of direct sunlight. Avoid sparks, flames and other ignition sources. Protect full containers from sources of heat to avoid over pressurisation. Store away from incompatible materials such as materials that support combustion (oxidising materials). Store in suitable, labeled containers. Protect from damage. Inspect periodically for damage and leaks. Have appropriate fire extinguishers available in and near the storage area.
<b>Recommended Materials</b>	Ordinary steel.
<b>Other Information</b>	Do not use alloys containing more than 2% of magnesium or plastic materials.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>National Exposure Standards</b>	No exposure standards have been established for this material by the National Occupational Health And Safety Commission (NOHSC). However, exposure standards for ingredients are:			
	Substance	STEL	TWA	
		ppm	mg/m <sup>3</sup>	ppm
	Chlorodifluoromethane			1000 3540

As published by the National Occupational Health and Safety Commission (NOHSC):  
 TWA - the Time-Weighted Average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.  
 STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.  
 According to current knowledge these concentrations should neither impair the health of, nor cause undue discomfort to, nearly all workers.  
 These Exposure Standards are guides to be used in the control of occupational health hazards. All

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<b>Biological Limit Values</b>	atmospheric contamination should be kept to as low a level as is workable. Exposure Standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals, they are not a measure of relative toxicity. No biological limit allocated.
<b>Engineering Controls</b>	Ensure sufficient ventilation to keep airborne concentrations below exposure limits. Mechanical exhaust ventilation is recommended.
<b>Respiratory Protection</b>	If engineering controls are not effective in controlling airborne exposure then respiratory protective equipment should be used suitable for protecting against airborne contaminants. Final choice of appropriate breathing protection is dependant upon actual airborne concentrations and the type of breathing protection required will vary according to individual circumstances. Expert advice may be required to make this decision. Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices.
<b>Eye Protection</b>	Safety glasses with side shields, or goggles are recommended. Final choice of appropriate eye protection will vary according to individual circumstances i.e. methods of handling or engineering controls and according to risk assessments undertaken. Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 - Eye Protectors for Industrial Applications.
<b>Hand Protection</b>	Wear leather gloves. Final choice of appropriate gloves will vary according to individual circumstances i.e. methods of handling or according to risk assessments undertaken. Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.
<b>Body Protection</b>	Suitable protective clothing should be worn e.g. cotton overalls buttoned at neck and wrist. When this product is handled the use of plastic aprons and rubber boots is recommended.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Form</b>	Gas
<b>Appearance</b>	Colourless gas
<b>Odour</b>	Slightly Ether-like
<b>Decomposition Temperature</b>	480°C
<b>Melting Point</b>	-160°C
<b>Boiling Point</b>	-40.8°C
<b>Solubility in Water</b>	3g/l at 25°C 1.5 g/l at 30°C
<b>Specific Gravity</b>	Not available.
<b>pH Value</b>	Not applicable
<b>Vapour Pressure</b>	0.91 MPa (9.1 bar) at 20°C 1.94 MPa (19.4 bar) at 50°C
<b>Vapour Density (Air=1)</b>	3.57 kg/m <sup>3</sup> at 20°C
<b>Physical State</b>	Gaseous at 20°C
<b>Octanol/Water Partition Coefficient</b>	log Pow = 1.08
<b>Density</b>	(20°C): 1213 kg/m <sup>3</sup> (50°C): 1085 kg/m <sup>3</sup>
<b>Flash Point</b>	No flashpoint in test conditions.
<b>Flammability</b>	Non-combustible. However, decomposition products will burn if exposed to fire.
<b>Auto-Ignition Temperature</b>	Not available
<b>Flammable Limits - Lower</b>	Not available.
<b>Flammable Limits - Upper</b>	Not available.
<b>Other Information</b>	Soluble in hydrocarbons and chlorinated solvents, alcohols, ketones and esters. Solubility of water in the product at 30°C: 0.15% in weight Henry's constant: 0.0294E5 Pa.m <sup>3</sup> /mol.

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## 10. STABILITY AND REACTIVITY

<b>Chemical Stability</b>	Stable under normal conditions of storage and handling.
<b>Conditions to Avoid</b>	Avoid extreme heat and red hot metallic surfaces. Certain mixtures of HCFC 22 and air under pressure and high temperatures may be combustible.
<b>Incompatible Materials</b>	Reacts violently with Chlorine. Avoid contact with alkalis, alkali earth metals and strong oxidisers.
<b>Hazardous Decomposition Products</b>	Thermal decomposition at temperatures above 480 °C resulting in very toxic and corrosive products including hydrogen fluoride, hydrogen chloride gas, phosgene and carbon oxides.
<b>Hazardous Reactions</b>	Not available.

## 11. TOXICOLOGICAL INFORMATION

<b>Toxicology Information</b>	The available toxicity data for the ingredients are as follows: Inhalation LC50(rat): 35 pph/15M Oral LD50(rat): > 43200 ug/kg
<b>Inhalation</b>	Inhalation of product vapours may cause irritation of the nose, throat and respiratory system. Effects of breathing high concentrations of vapour may include headache, sleepiness, nausea. 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.
<b>Ingestion</b>	Not considered a potential route of exposure. However if ejected liquified gas is ingested, may result in frostbite of lips, tongue, mouth and digestive tract.
<b>Skin</b>	May cause redness, itching and irritation. However if contact with ejected liquified gas: frostbite possible.
<b>Eye</b>	May cause eye irritation, tearing, stinging, blurred vision, and redness. However if contact with ejected liquified gas: frostbite possible.
<b>Chronic Effects</b>	Studies of prolonged inhalation in animals have not shown sub-chronic toxic effects (various animal species/several months/10000ppm)
<b>Other Information</b>	<b>SPECIFIC EFFECTS</b> <b>GENOTOXICITY :</b> According to available experimental data. Overall not geno toxic <b>CARCINOGENICTY:</b> Experimentation on animals has not shown clear evidence of carcinogenic effect. (rat/mouse/Inhalation). <b>REPRODUCTIVE TOXICITY:</b> Absence of toxic effects on fertility According to limited available data in animals: (rat/mouse/ Inhalation) Foetal development: Experimental effects on animals: Absence of congenital malformations and embryo toxic effects in rodents at non-toxic doses for the mothers (rat/rabbit/ Inhalation)

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	<b>AQUATIC TOXICITY</b> Acute toxicity Fish: toxicity threshold, 24hr = 180 mg/l Bacteria under anaerobic conditions: toxicity threshold, 24hf > 400mg/l
<b>Persistence / Degradability</b>	In water Not readily biodegradable: 0% after 28 d. In air Degradation in the atmosphere: t <sub>1/2</sub> life = 8.4 y. Ozone depletion potential: ODP (R-11 = 1) = 0.055 Halocarbon global warming potential: HGWP (R-11 = 1) = 0.33 In soils and sediments Moderate absorption: log Koc = 1.8 Rapid evaporation: t <sub>1/2</sub> life = 2.7h
<b>Mobility</b>	
<b>Bioaccumulative Potential</b>	Practically not bio-accumulable : log Pow = 1.08

