KUGESI
DISTRIBUTORS OF REFRIGERANT

MATERIAL DATA SAFETY SHEET

 Date: 1st September 2008

1) Product and company identification

PRODUCT NAME: Refrigerant Gas 409a

SUPPLIER DETAILS Kugesi Refrigerants (Pty) Ltd
8 Benetton Street
Racing Park
Killarney
Cape Town, ZA
Tel: +27 21 556 2652
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2) Composition/Information on ingredients

Chemical nature: Blend of HCFC 22, HCFC 142b & HCFC 124

Hazardous Constituents: 60% HCFC22 Chlorodifluoromethane
15% HCFC 142b Chlorodifluoroethane
25% HCFC 124 Chlorotetrafluoroethane

3) Hazards identification

Adverse human health effects: Liquefied gas, contact of liquid may cause frostbite and injury to the Cornea. High exposures may cause an abnormal heart rhythm and prove fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation. Liquid splashes may cause freeze burn to the skin and eyes.

Physical and Chemical hazards: Heating will cause a rise in pressure and risk of bursting. On combustion toxic gasses are released.

4) First Aid Measures

Inhalation: Move the affected person away from the contaminated area and into fresh air. Keep the person warm and at rest. Administer oxygen if necessary. If breathing stops give artificial respiration. In the event of cardiac arrest apply external cardiac massage. Call a doctor immediately.

Skin Contact: Contact of liquid with Skin: Immediately rinse plenty of water to thaw the affected area. Immediately remove contaminated clothing or footwear. Clothing may adhere to the skin, if it sticks do not pull it off. Cover affected area with sterile dressing. If irritation or blistering occurs seek immediate medical attention.

Eye Contact: Contact of liquid with eyes: rinse with water whilst keeping the eyes wide open irrigate for at least 10 minutes. Consult an eye specialist immediately.

Ingestion: This is an unlikely route of exposure. If exposure takes place do not induce vomiting. Providing the patient is conscious, wash out the mouth with water and give 200-300Ml of water to drink. Obtain immediate medical attention as ingestion will cause freeze burns.

Note to the physician: Avoid administering adrenaline or any other similar products as cardiac arrhythmia may result with possible subsequent cardiac arrest.

5) Fire- Fighting Measures

Extinguishing Media: All extinguishing agents can be used.

Specific Hazards: HCFC 409A is not flammable under ambient conditions of temperature and pressure. Certain mixtures of HFC 409A and air when under pressure may be flammable. Mixtures of HCFC and Chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours.

Specific Fire Fighting Methods: Stay upwind. Evacuate the personnel away from the fumes. Cool down the containers/ equipment exposed to heat with water spray.
Protection of the Fire Fighters: Self contained breathing apparatus and full protective clothing must be worn in fire conditions.

6) Accidental Release Measures

Personal Precautions: Avoid contact with skin and eyes, Do not breathe gas. No naked Flames. Do not smoke. For further information refer to section 8 “exposure controls/personal protection”.

Heavy vapours, shut off low level openings in the vicinity (ventilation shafts, drains) prevent the product from entering cellars, basements, or pits since the vapour may create a suffocating atmosphere. Provided it is safe to do so, isolate the source of the leak. Allow small spillages to evaporate provided there is adequate ventilation.

Large Spillages: Ventilate spillage area, contain spillage with earth or sand or any suitable absorbent material.

Environmental Precautions: Contain the spilled material, prevent the product from spreading into the environment.

Methods of cleaning up: Recover as much product as possible, allow residual product to evaporate for disposal of contaminated material refer to section 13.

7) Handling and Storage

Handling

Technical Measures: Ventilation is required, Use Closed systems. Avoid contact with hot surfaces. Avoid High temperatures. Smoking is forbidden. Avoid inhalation of high concentrations of vapours.

Atmospheric levels should be controlled in compliance with occupational exposure limit. 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 as corrosive and very toxic decomposition products can be formed. Avoid contact between the liquid and skin and eyes.

Liquid transfer of refrigerants between refrigerant containers and to and from systems can result in static generation, ensure adequate earthing to avoid this.

Storage

Technical measures: storage area should be equipped with ventilation at low level, Take necessary measures to avoid the accidental release of the product outside, due to rupture of containers or transfer systems.

Storage conditions: Keep the containers tightly closed and dry in a cool and well ventilated area at temperatures not exceeding 45C and away from any source of heat including direct sun light. Avoid storing near to the intake of air conditioning units, boiler units or open drains and away from any source of Ignition

Packaging material: Steel is recommended.

8) Exposure Controls/ Personal Protection

Engineering measures: Ensure good ventilation of the work station

Occupational exposure limits: Exposure limits LTEL 1,000ppm 8 hr TWA 3590mg/m3 OES

Personal Protective Equipment: In event of insufficient ventilation self contained apparatus is required. Refrigerants should only be handled with the use of protective gloves insulated against the cold. Eyes should be protected with goggles and to protect the skin and body Impermeable clothing should be worn. Do not drink, eat or smoke in the workplace.

9) Physical and Chemical Properties

Appearance
Physical State is compressed Liquefied gas, colourless with a slight ethereal odour.
Oxidising properties: Non oxidising material according to EEC criteria
Vapour Pressure 107 psi @ 70F
Vapour density: (Air=1)>3.42 at bubble point air = 1
Specific Gravity: 1.21 @21.1˚C
Liquid density: 11.924Kg/M3
Solubility in water: Insoluble

10) Stability and Reactivity

Stability: Stable at ambient temperature and under normal conditions of use

Conditions to Avoid: May decompose on contact with hot surfaces and flames incompatible with Alkali metals, sodium, Potassium, Barium, Magnesium, alloys and powered metals.

Hazardous decomposition products: On Combustion or thermal decomposition (Pyrolysis) and Hydrolysis releases toxic gasses (halo9genated compounds) (Hydrogen Chloride and hydrogen Fluoride)

11) Toxicological Information

Acute Toxicity: Vapours: Published data

Acute Symptoms: Effects following high level exposure: Headaches, Dizziness, Loss of Consciousness

Inhalation: High exposures may cause abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation,

Skin Contact & Eye Contact: Liquid Splashes or spray may cause freeze burns unlikely to be hazardous through skin absorption.

Ingestion: Highly unlikely but should this occur freeze burns will result

Long terms exposure:. ***:***. A lifetime of inhalation study in animals has shown that high exposure
HCFC-22: LC50 : 4 hr. (rat) - > 250,000 ppm
Cardiac Sensitization threshold (dog) > 50,000 ppm
HFC-142b**:** LC50 : 4 hr. (rat) - > 128,000 ppm
Cardiac Sensitization NOEL – 50,000 ppm
HFC-124: LC50 : 4 hr. (rat) - > 800,000 ppm
Cardiac Sensitization threshold (dog) 75,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:
HCFC-22: Subchronic NOEL (rat) – 10,000 ppm
HFC-142b: Subchronic inhalation (rat) NOEL – 20,000 ppm
HFC-124: Teratogenic NOEL (rat and rabbit pups) – 50,000 ppm (rat and rabbit dams) – 15,000 ppm
Subchronic inhalation (rat and mouse) NOEL – 15,000 ppm
2 yr. Chronic Toxicity/Oncogeniticity Study (rat) NOEL – 50,000 ppm

OTHER DATA:
Lifetime exposure of male rats to HCFC-22 was associated with a small increase in salivary gland fibrosarcomas
HFC-124, HFC-142b: Not active in four genetic studies

12) Ecological Information

Behaviour in the environment: High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Vapour

Mobility: Product is Volatile when in aqueous solution

Persistence/Degradability: *Decomposes comparatively rapidly in lower atmosphere (troposphere), products of decomposition will be highly dispersed and hence will have a very low concentration. Is not a VOC under UNECE agreement.*

Bioaccumulation: Non Bioaccumlative

Destination of Product: AIR

13) Disposal Considerations

Waste from Residues: Do not allow the product to be released into the environment, Consult the manufacturer or supplier for information regarding recovery and recycling of the product, if recovery is not possible Incinerate at a licensed installation.

Contaminated Packaging: Degas , Reusable containers return to supplier Disposable containers dispose of at an authorised land fill site.

The users attention is drawn to the possible existence of local regulations regarding disposal.

14) Transport Information

Road and Rail Transport:
Un No. 1018
ERG No 126
Hazchem warning 2 C Non Flammable Gas

Sea Transportation:
IMDG 1018
Class 2.2
Label Non-flammable gas

Air Transportation:
ICAO/IATA code 1018
Class 2.2

Packaging instructions
- Cargo 200
- Passenger 200

Maximum quantity allowed
- Cargo 150 kg
- Passenger 75 kg

15) Regulatory Information
EEC Hazard class Non-flammable gas
Risk phrases R20 Harmful by inhalation
R34 Liquid phase could cause burns
R44 Risk of explosion when heated under

Confinement
Safety phrases S9 Keep container in a well-ventilated place
S15 Keep away from heat
S23 Do not breathe the gas.
S36 Wear suitable protective clothing
S41 In case of fire/explosion do not breathe

Fumes
S51 Use only in well ventilated areas
S56 Do not discharge into the environment.
Dispose to an authorised waste collection point
National legislation None
Refer to SABS 0265 for explanation of the above.

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