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# MATERIAL SAFETY DATA SHEET

## (REFRIGERANT GAS R406A)

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### 1.CHEMICAL PRODUCT/COMPANY IDENTIFICATION

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**Product Identification:**

Name: R406A

Chemical Family: Halogenated Hydrocarbons+Paraffinic Hydrocarbons

Formula: Mixture of-C<sub>4</sub>H<sub>10</sub>/CH<sub>3</sub>CCIF<sub>2</sub>/CHCIF<sub>2</sub>

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### 2.COMPOSITION/INFORMATION ON INGREDIENTS

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INGREDIENT NAME	CAS NUMBER	WEIGHT %
Chlorodifluoromethane (HCFC-22)	75-45-6	55
1-Chloro-1,1-Difluoroethane(R-142b)	75-68-3	41
Isobutane (HC-600a)	75-28-5	4

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### 3.PHYSICAL AND CHEMICAL PROPERTIES

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**Physical Data**

Boiling(bubble)point:-26.23 F

Percent volatile by volume: 100

Boiling(dew)point:-10.05 F

Mol.W:89.87

Density(liquid 70 F)70.27 LB / FT<sup>3</sup>

Pressure:95 PSIA@70 F

Vapor Density(Air=1):@70F 1.29 LB / FT<sup>3</sup>

Solubility in H<sub>2</sub>O:slight

pH information: Neutral

Freezing point: Not Established

Appearance and odor: Colorless liquified gas with thintetheral odor

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### 4.HEALTH HAZARD INFORMATION

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**Principle Health Hazards:**

**Inhalation:** Vapor is heavier than air and can cause suffocation by displacing oxygen available for breathing. Contact with liquid may cause frostbite. Breathing high concentrations of vapor may cause light headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. May cause eye irritation.

**Toxicity/Exposure limits:**

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OSHA and ACGIH Not established, but recommend TWA 1000 PPM.

Humans exposed to Isobutane, 500 PPM, 8 hours / day, 5 days / week, for 4 weeks, showed no cardiac, pulmonary or other functional abnormalities.

Chlorodifluoroethane inhalation-Rat-4 HR LC50=128,000 PPM.

Low in toxicity at concentrations as high as 4%(40,000 ppm).Narcotic effects have been seen at 200,000 ppm. Heart efficiency(animal studies) has been reported to be reduced at concentrations of over25,000 ppm. Cardiac sensitization to epinephrine has been observed at concentrations of 50,000 ppm.

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## 5. HAZARDOUS REACTIVITY

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### **Stability:**

Material is stable. However, avoid open flames and high temperatures.

### **Incompatibility(materials to avoid):**

Strong oxidants, including oxygen.

Freshly scraped aluminum, Alkali metals, and Alkali earth metals (sodium, magnesium, etc), may cause exothermic reaction. Aluminum in refrigeration systems contains an oxide/chloride coating, so it does not react.

### **Hazardous decomposition products:**

May decompose at high temperatures(above 400F-500F), and from contact with hot metal, heating elements, pilot lights, internal combustion engines, and open flames. Decomposition products may include hydrofluoric and hydrochloric acids, chlorine, fluoride, possibly phosgene, carbon dioxide, and Carbon monoxide.

**Polymerization:** Will not occur.

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## 6. FIRE AND EXPLOSION DATA

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Flash Point: NONE

Autoignition temperature: N/A

Autodecomposition Temperature: 400-500F or above

Fire and Explosion:

Cylinders may vent or rupture in fire conditions, leading to decomposition.

Extinguishing Media: Water spray.

Special Fire Fighting Instructions:

Use self-contained breathing apparatus. Use water spray to cool cylinders to prevent bursting or venting under fire conditions.

### **First Aid**

**SKIN:** Promptly flush skin with water until all chemical is removed. If there is evidence of

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frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

**EYES:** Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

**INHALATION:** Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give epinephrine (adrenaline).

**INGESTION:** Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

**ADVICE TO PHYSICIAN:** Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

## 7.ACCIDENTAL RELEASE MEASURES

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### **Safeguards (Personnel)**

**NOTE:** Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) if large spill or leak occurs.

### **Spill Clean Up**

Comply with Federal, State and local regulations for reporting releases.

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## 8.HANDLING AND STORAGE

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### **Handling (Personnel)**

Avoid breathing vapors or mist. Avoid contact with eyes or skin. Use with sufficient ventilation to keep employee exposure below recommended limits.

### **Storage**

Store in a clean, dry place. Do not heat above 52 °C(126°F).

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## 9.EXPOSURE CONTROLS/PERSONAL PROTECTION

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**Engineering Controls**

Use sufficient ventilation to keep employee exposure below recommended limits. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

**Personal Protective Equipment**

Lined butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact.

Fire protective clothing (NOMEX) with antistatic control should be worn when handling this product.

Under normal manufacturing conditions, no respiratory protection is required when using this product.

Self-contained breathing apparatus (SCBA) is required if a large release occurs.

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## 10. STABILITY AND REACTIVITY

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**Chemical Stability**

Stable

**Conditions to Avoid**

Avoid open flames and high temperatures.

**Incompatibility with Other Materials**

Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

**Decomposition**

Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric and hydrofluoric acids, and possibly carbonyl halides.

**Polymerization**

Polymerization will not occur.

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## 11. TOXICOLOGICAL INFORMATION

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General LC50/1h (ppm)      LD50(Rat)-Ingestion of 7340 mg/kg.

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## 12. ECOLOGICAL INFORMATION

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**General**

Product is persistent in air (atmospheric lifetime: 14 years.)

Product is not significant hazardous for the aquatic environment as:

Considerable volatility. No bioaccumulation.

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## 13.DISPOSAL CONSIDERATIONS

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### General

Comply with local and national regulations. Contact the producer for recycling. To avoid treatment, as far as possible, use dedicated containers.

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## 14.TRANSPORTATION INFORMATION

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**Proper Shipping Name:** REFRIGERANT GAS, N.O.S.

(Chlorodifluoromethane, Chlorodifluoroethane, Isobutane)

**HAZARD CLASS:** 2.2

**UN NO.:** 1078

**Primary label:** Nonflammable Gas

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## 15.REGULATORY INFORMATION

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### Number in Annex

Not dangerous according to Dir. 88/EEC.

### EC Classification

-Symbol

-Labeling of cylinders      Labeling "Dangerous for environment" not classified in the absence of classification to be applied to dangerous preparations.

-Risk phases

-EEC Hazard Class

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## 16.OTHER INFORMATION

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The information given correspond to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product that confirms to the specification, unless otherwise stated. In the case of combinations and mixtures one must make that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and environment.

Responsibility for MSDS: MSDS Coordinator

Indicates updated section.

End of MSDS