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# industrial water chiller

## R410A gas chemical safety data sheet

PRODUCT NAME: REFRIGERANT GAS R410A

### COMPOSITION/INFORMATION ON INGREDIENTS

CAS No.: 133023-17-3 EEC No.: 206-557-8

### HAZARDOUS INGREDIENT(S)

|                   |       |                   |                    |
|-------------------|-------|-------------------|--------------------|
| Pentafluoroethane | (50%) | CAS No.: 354-33-6 | EEC No.: 206-557-8 |
| Difluoromethane   | (50%) | CAS No.: 75-10-5  | EEC No.: 200-839-4 |

### HAZARDS IDENTIFICATION

Emergencies overview: Colorless, volatile liquid with eterea and faint sweetish odor. Nonflammable material. Overexposure may cause dizziness and loss of concentration. At higher level, CNS depression and cardiac arrhythmia may result from exposure. Vapor displace air and can cause asphyxiation in confined space. At higher temperature, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl Halides.

### POTENTIAL HEALTH HAZARDS

Skin: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

Eyes: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

Inhalation: R-410A is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

Ingestion: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

Delayed Effects: None known.

### FIRST AID MEASURES

Skin: Promptly flush skin with water until all chemical is removed. If there is any evidence of 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. Do not give epinephrine (adrenaline).



|             |                                                                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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   | Because of the possible disturbances of cardiac rhythm, catecholamine drugs, physician: 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. |

## FIRE-FIGHTING MEASURES

### Flammable properties

|                           |                                         |
|---------------------------|-----------------------------------------|
| Flash point:              | Gas, not applicable per DOT regulations |
| Flash point method:       | Not applicable                          |
| Autoignition temperature: | > 750°C                                 |
| Upper flame limit:        | None by ASTM D-56-82                    |
| Lower flame limit:        | None by ASTM E 681                      |
| Flame propagation rate:   | Not applicable                          |
| OSHA flammability class:  | Not applicable                          |

|                      |                                                                                                                           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------|
| Extinguishing media: | Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable). |
|----------------------|---------------------------------------------------------------------------------------------------------------------------|

### Unusual fire and explosion hazards:

R 410A is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition source.

Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

### Unusual firefighting precautions/instruction:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire exposed containers cool.

## HANDLING AND STORAGE

Normal handling: Avoid breathing vapors and liquid contact eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders. R 410A should not be mixed with air above atmospheric pressure for leak testing or any other purpose.



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### Storage recommendations:

Store in a cool, well ventilated area of low fire risk and out of direct and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

### EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering control: Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

#### Personal Protective Equipment

Skin protection: Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

Eye protection: For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

Respiratory protection: None generally required for adequately ventilated work conditions. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH-approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH-approved gas mask with organic vapor canister.

#### Additional recommendations:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for area of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations.

#### Exposure guidelines

Pentafluoroethane : UK [ppm] : 1000

#### Symbology:





#### PHISICAL AND CHEMICAL PROPERTIES

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| Appearance:              | clear, colorless liquid and vapor                                 |
| Physical state:          | gas at ambient temperatures                                       |
| Molecular weight:        | 72,6                                                              |
| Chemical formula:        | CH <sub>2</sub> F <sub>2</sub> , CHF <sub>2</sub> CF <sub>3</sub> |
| Odor:                    | Faint etereal odor                                                |
| Specific gravities:      | 1.08 @ 21.1°C                                                     |
| Solubility in water:     | Unknown                                                           |
| pH:                      | Neutral                                                           |
| Boiling point:           | -48,5°C                                                           |
| Freezing point:          | Not determined                                                    |
| Vapor pressure:          | 215.3 psia @ 70°F 490.2 psia @ 130°F                              |
| Vapor density (air=1.0): | 3.0                                                               |
| Evaporation rate:        | > 1                                                               |
| % Volatiles:             | 100                                                               |
| Flash point:             | Not applicable                                                    |

#### STABILITY AND REACTIVITY

Stability an reactivity: The product is stable. Do not mix oxygen or air above atmospheric pressure. Any source of high temperature, such a lighted cigarettes, flames, hot spots or welding may yeld toxic and/or corrosive decomposition products.

Incompatibilities: (under specific conditions: e.g. very high temperatures and/or appropriate pressure) – Freshly abraded aluminium surfaces (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminium, magnesium and zinc.

Hazardous decomposition products: Halogens, halogen acids and possibly carbonyl halides.

Hazardous polymerization: Will not occur

#### TOXICOLOGICAL INFORMATION

Immediate (acute) effects :  
 Difluoromethane: LC<sub>50</sub> : 4 hr. (rat) - ≥ 520,000 ppm  
 Pentafluoroethane: Cardiac Sensitization threshold (dog) ≥ 100,000 ppm

Delayed effects :  
 Teratology - negative  
 (subchronic and chronic) Subchronic inhalation (rat) NOEL - 50,000 ppm

Other data: Not active in four genetic studies

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## ECOLOGICAL INFORMATION

Degradability (BOD): R 410A is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: Log P<sub>OW</sub> = 1.48 (pentafluoroethane), 0.21 (difluoromethane)

## DISPOSAL CONSIDERATION

RCRA: Is the unused product a RCRA hazardous waste if discarded ? – Not a hazardous waste

If yes, the RCRA ID number is: – Not applicable

Other disposal consideration: Disposal must comply with federal, state, and local disposal or discharge laws.

## TRANSPORT INFORMATION

|                              |                                                                |
|------------------------------|----------------------------------------------------------------|
| No. ONU:                     | 3163                                                           |
| H.I. n°:                     | 20                                                             |
| Shipping Name:               | LIQUEFIED GAS N.O.S. (Pentafluoroethane, Difluoromethane (R32) |
| Classe ADR/RID:              | 2                                                              |
| Codifica classifica ADR/RID: | 2 A                                                            |
| Hazard class:                | 2.2                                                            |

Other transport information: Avoid transport on vehicles where the load space is not separated from the driver.  
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in case of an accident or emergency.

Before transporting product:

- Ensure that containers are firmly secured
- Ensure that the cylinder valve is closed and not leaking.
- Ensure that the valve protection device, if provided, is correctly fitted.
- Ensure valve, if supplied, is correctly fitted.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

## REGULATORY INFORMATION.

- EC Labelling: Not classified as dangerous
- Symbol(s): None
- R Phrases: None
- S Phrases: None



## OTHER INFORMATION

In high concentrations may cause asphyxiation.

Keep container in a well-ventilated place.

Do not breathe the gas. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Pressure vessel.

Ensure compliance with all national and regional regulations.

This safety data sheet has been compiled in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national legislation.

Before using this product in any new process or experiment, a thorough study should be conducted on the safety and compatibility of the product with the materials.

The information contained in this document is believed to be correct at time of printing. The company is not liable for any damage caused by the use of incorrect product and / or under conditions other than the one provided.

## GLOSSARY

OES: Occupational Exposure Standard (UK HSE EH40)

MEL: Maximum Exposure Limit (UK HSE EH40)

COM: The company aims to control exposure in its workplace to this limit

TLV: The company aims to control exposure in its workplace to the ACGIH limit

TLV-C: The company aims to control exposure in its workplace to the ACGIH Ceiling limit

MAK: The company aims to control exposure in its workplace to the German limit

Sk: Can be absorbed through skin

Sen: Capable of causing respiratory sensitization

Bmgv: Biological monitoring guidance value (UK HSE EH40)

ILV: Indicative Limit Value (UK HSE EH40)