

## SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<b>Product Name in English:</b>	Refrigerants Gas R410A
<b>Synonyms:</b>	HFC 410A
<b>Formula:</b>	CHClF <sub>2</sub> , CH <sub>3</sub> CF <sub>3</sub> , CHF <sub>2</sub> CF <sub>3</sub>
<b>Supplier:</b>	Global Refrigerants (S) Pte Ltd
<b>Address:</b>	No.9 TUAS LINK 1, SINGAPORE 638587
<b>Representative in Georgia:</b>	Nemera Ltd
<b>Status:</b>	Exclusive Distributor in Caucasus Region, Trademark Owner
<b>Address:</b>	0159, 115A Tsereteli Ave., Tbilisi, Georgia
<b>Phone:</b>	+995322350385, +995577452960
<b>E-mail:</b>	<a href="mailto:anri@nemera.ge">anri@nemera.ge</a>
<b>Web:</b>	<a href="http://www.nemera.ge">www.nemera.ge</a>



## SECTION II COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Difluoromethane (HCFC – 32)	75-10-5	50
Pentafluoroethane (HFC – 125)	354-33-6	50

## SECTION III – HAZARDS IDENTIFICATION

**Hazardous Classification:** Class 2.2 Compressed Gas and Non-combustible Gas

**Primary Routes of Entry:** Inhalation, Dermal, Eyes

**Emergency Overview:** Inhalation of high concentrations of vapor is harmful and may cause ear irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air.

### Potential Health Hazards:

**Skin:** Skin contact may cause frostbite from exposure to the liquid.

**Eyes:** Irritant. Liquid contact will irritate and may cause conjunctivitis.

**Inhalation:** Inhalation may include nonspecific discomfort, such as nausea, headache, or weakness; or temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness.

## SECTION IV – FIRST AID MEASURES

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

**Skin:** Promptly flush skin with water until all chemical is removed. If there is 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.

**Inhalation:** Immediately remove patient to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. 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.

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## SECTION V – FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** R410A is not flammable in air at temperatures up to 100 °C at atmospheric pressure. However, mixtures of these products with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. These products can also become combustible in an oxygen enriched environment. Cylinders may rupture under fire conditions. Decompositions may occur. Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of torch flames. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames.

**Fire Fighting Instructions:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Cool containers/ tanks with water spray. In the event of fire, wear self-contained breathing apparatus.

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## SECTION VI – ACCIDENTAL RELEASE MEASURES

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**Personal Precautions:** Immediately contact emergency personnel. Use suitable protective equipment. Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

**Environmental Precautions:** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Methods for Cleaning-up:** Evaporates.

**In Case of Spill or Other Release:** (Always wear recommended personal protective equipment) Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low areas.

## SECTION VII – HANDLING AND STORAGE

**Handling:** Avoid breathing vapours and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders. Follow standard safety precautions for handling and use of compressed gas cylinders. R410A should not mix with air above atmospheric pressure for leak testing or any other purpose.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52° C.

## SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

### Authorized Limit Values:

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Difluoromethane	None	None	*1000 ppm TWA (8hr)
Pentafluoroethane	None	None	*1000 ppm TWA (8hr)

\*= Workplace Environmental Exposure Level (AIHA)

**Engineering Controls:** Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

**Respiratory Protection:** Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Hand Protection:** Chemical-resistant, impervious gloves or gauntlets complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Eye Protection:** Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

**Skin Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling.

## SECTION IX – PHYSICAL & CHEMICAL PROPERTIES

**Appearance:** Gas at ambient temperatures

**Colour:** Colourless

**Odour:** Slight, ether-like

**Molecular Weight:** 72.6

**Boiling Point (1012 mbars):** - 48,5 °C

**pH:** Neutral

**Vapour Pressure:** 239.7 psia (25 °C)

**Vapour Density (air=1):**3.0 (25°C)

**Specific Gravity (water = 1.0):** 1.066(25°C)

**Solubility:** Not determined

**Application:** Refrigerant.

## SECTION X – Stability AND REACTIVITY

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**Stability:** The product is stable. Do not mix with oxygen or air above atmospheric pressure. Any source high temperatures, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

**Incompatibility With other Materials:** Avoid contact with strong alkali or alkaline earth metals, finely powdered metals such as aluminum, magnesium or zinc and strong oxidizers since they may react with or accelerate decomposition of this material.

**Hazardous Decomposition Products:** Thermal decomposition products include hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide and chlorine and possibly carbonyl halides. These materials are toxic and irritating. Contact should be avoided.

Hazardous Polymerization: Will not occur.

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## SECTION XI -- -- TOXICOLOGICAL INFORMATION

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### Immediate (Acute) Effects:

HFC-32: LC<sub>50</sub> : 4 hr. (rat) > 520,000 ppm / Cardiac Sensitization threshold (dog) 350,000 ppm

HFC-125: LC<sub>50</sub> : 4hr. (rat)> 800,000 ppm / Cardiac Sensitization threshold (dog)> 75,000 ppm

### Delayed (Subchronic and Chronic) Effects:

HFC-32: Teratogenic NOEL (rat and rabbit) – 50,000 ppm

Subchronic inhalation (rat) NOEL --- > 50,000 ppm

HFC-125: Teratogenic NOEL (rat and rabbit) – 50,000 ppm

Subchronic inhalation (rat) NOEL: >50,000 ppm

### Other Data:

HFC-32, HFC-125: Not active in four genetic studies

Toxicity to reproduction: Did not show mutagenic or teratogenic effects in animal experiments.

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## SECTION XII – ECOLOGICAL INFORMATION

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### Degradability (BOD):

R410A is a gas at room temperature; therefore it is unlikely to remain in water.

### Octanol water Partition Coefficient

Log Pow = 1.48 (HFC---125)

Log Pow = 0.21 (HFC---32)

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**SECTION XIII – DISPOSAL CONSIDERATIONS**

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**Nature of the Waste:** Not a RCRA hazardous waste.

**Waste Treatment:** Waste from residues / unused products: Can be used after re-conditioning. Product removed from the cylinder must be disposed of in accordance with appropriate National and local regulation. Return cylinders with residual product to the supplier.

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**SECTION XIV – TRANSPORT INFORMATION**

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**Proper Shipping Name:** Liquefied Gas n.o.s.  
(Pentafluoroethane and Difluoromethane)

**Hazard Class:** 2.2.

**UN-NO.:** 3163.

**Marking:** 5

**Primary label:** Nonflammable  
Gas

**Packing group:** III.

**Packing Method:** ISO Tanks, Cylinders, Ton Tanks.

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**SECTION XV – REGULATORY INFORMATION**

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\*Common dangerous chemical classification and labelling (GB13690---92).

\*Regulations on the Control over Safety of Dangerous Chemicals (State Council Decree 344 [2002])

\*Regulations on the Safety Use of Chemicals in workplaces (Department of Labor, Reg 423 [1996], are enacted to control the safe use, production, storage, transport, operation, trade and disposal of dangerous chemicals.

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