SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, amended by 2015/830/EU

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the product

Product Description R-407C

Pure Substance/preparation Preparation

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant Identified Uses Manufacture of substances, Refringent

Uses advised against Only use for industrial or professional use.

1.3 Details of the Supplier of the Safety Data Sheet

Gujrat Fluorochemicals Ltd.

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1.4 Emergency Telephone Number

Emergency telephone number +91-2678-248107, 248152

2. Hazard Identification

2.1 Classification of the substance or Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Gases Under Pressure – Liquified Gas Category 1 - 280

Pictogram

Signal Word
Warning

Hazard Statements
H280 Contains gas under pressure; may explode if heated

Precautionary Statements

Prevention
No precautionary statement assigned

Response
No precautionary statement assigned

Storage
P410+P403 Protect from sunlight. Store in a well-ventilated place.

Disposal
No precautionary statement assigned

2.3 Other hazards

Liquids can cause burns similar to frostbite.

3. Composition/information on Ingredients

3.1. Substance

Chemical name	CAS-No	EC No	Weight %	EU - GHS Substance Classification (REGULATION (EC) No 1272/2008)	REACH No.
Difluoromethane	75-10-5	200-839-4	23	Flam. Gas 1B - H221 Press. Gas (Liq.) - H280	-
Pentafluoroethane	354-33-6	206-557-8	25	Press. Gas (Liq. Gas) - H280	-
Chlorodifluoromethane	75-45-6	200-871-9	52	Press. Gas (Liq.) - H280 Ozone 1 - H420	-

For the full text of the H-Statements mentioned in this Section, see Section 16

4. First aid measures

4.1 Description of first-aid measures

General advice In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

Eye contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Skin contact Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Frostbite: Treat as thermal burn. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion Due to its physical form, exposure to this chemical is not likely. Do NOT induce vomiting. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs,

get medical attention. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get immediate medical advice/attention.

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

Eyes : Liquid can cause frostbite
Skin : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite
Inhalation : Acts as a simple asphyxiant
Ingestion : Ingestion is not a normal route of exposure

Indication of immediate medical attention and special treatment needed

Headache, dizziness, shortness of breath, loss of balance and coordination, convulsive twitches, tremor, numb feeling in the hands, salivation, irritation of upper respiratory tract, eyes, chest pain, weakness.

Treat symptomatically and supportively.
Adrenaline and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media CO_2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Unsuitable extinguishing media None Identified

5.2 Special hazards arising from the substance or mixture

Special Hazard Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous Combustion Products Thermal decomposition giving toxic and corrosive products:
hydrogen chloride HCl, hydrogen fluoride HF, carbon monoxide CO, carbonyl chloride $COCl_2$, carbonyl fluoride COF_2, chlorine Cl_2

5.3 Advice for Firefighters

In case of fire: Evacuate area. Cool containers / tanks with water spray. Ensure a system for the rapid emptying of containers. In case of fire, remove exposed containers. Fight fire remotely due to the risk of explosion. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with skin and eyes. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. In enclosed areas: ventilate or wear a self-contained breathing apparatus (risk of anoxia). Remove all sources of ignition. Do not smoke. Evacuate personnel to safe areas. For personal protection see section 8.

6.2 Environmental Precautions

Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Stop leak if easy to do so. Immediately contact emergency personal. Use spark-proof tools and explosion-proof equipment.

6.4 Reference to other sections

Hazardous combustion products: see section 10. Personal Protective equipment: See section 8. Incompatible materials: see section 8. Incompatible Material: see section 10. Disposal Consideration: see section 13

7. Handling and Storage

7.1 Precautions for Safe Handling

7.1.1 Handling

Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Avoid release to the environment. Refer to special instructions/safety data sheet. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

7.1.2 Hygiene measures

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from open flames, hot surfaces and sources of ignition. Keep in a cool, well-ventilated place. Protect full containers from sources of heat to avoid over pressurization. Keep away from direct sunlight. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over.

7.3 Specific end uses

Industrial chemicals, Manufacture of substances

8. Exposure Controls/ Personal Protection

8.1 Control Parameters

Exposure Limits Apply technical measures to comply with the occupational exposure

Component	AIHA WEEL	ACGIH TLV	OSHA PEL
Difluoromethane (75-10-5)	TWA : 1000 ppm 8hr	TWA: 1000 PPM	TWA: 3500 mg/m^3 TWA: 1000 PPM

Component	WEEL	SWEDEN Limit value - Eight Hour	Limit value - Short term
Pentafluoroethane (354-33-6)	TWA : 1000 ppm	500 ppm	750 ppm

Component	Long TERM Exposure limit (EU) LTET Values	ACGIH TLV	NIOSH IDLH
Chlorodifluoromethane (75-45-6)	3600 mg/m^3 1000 ppm	TWA: 1000 PPM	TWA: 3500 mg/m^3 TWA: 1000 PPM

Derived No Effect level (DNEL) No information available

Predicted No Effect Concentration (PNEC) No information available

8.2 Exposure Controls

Appropriate Engineering Control Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below occupational exposure limits. Gas detectors should be used when toxic quantities may be released. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system and under strictly controlled conditions. Use only permanent leak tight installations (e.g. welded pipes). Do not eat, drink or smoke when using the product.

Personal protective equipment

Eye protection Tightly fitting safety goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Hand protection Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

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. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Environmental exposure controls Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance Clear, colorless liquid and vapor

Physical state	Gas at ambient temperatures
Odor	Faint ethereal odor
Odor threshold	No data available

Property	VALUES	Remarks/ Method
pH	Neutral	
Melting point/freezing point	No data available	
Boiling Point/Range	-43°C (-55.4°F)	
Flash Point	No data available	
Evaporation rate	>**1COMPARED TO:** CCl4 = 1	
Flammability (solid, gas)	No data available	
Flammability or explosive limits	No data available	
Lower Explosive Limit (LEL)	--	
Upper Explosive Limit (UEL)	--	
Specific Gravity (water = 1.0)	1.16 @ 21°C (70°F)	
Relative Density	No data available	
Vapor Density (air = 1.0)	3.0	
Vapor pressure	156.2 psia @ 70°F 356.7 psia @ 130°F	
Water solubility	Unknown	
Solubility in Other Solvents	No data available	
Partition coefficient: n-octanol/water	No data available	
Autoignition temperature	No data available	
Critical temperature	No data available	
Decomposition temperature	>250°C	
Viscosity Kinematics	Not applicable	
Viscosity Dynamics	Not applicable	
Oxidizing properties	No data available	
Explosive properties	No data available	

9.2 OTHER INFORMATION

Additional Information	Gas/Vapor heavier than air. May accumulate in confined space, particularly at or below ground level.

10. Stability and Reactivity

10.1 Reactivity

No further relevant information available.

10.2 Chemical stability

This product is stable at normal handling and storage conditions.

10.3 Possibility of hazardous reaction

No additional information available.

10.4 Conditions to avoid

Protect from sunlight. Do not expose to temperature exceeding. Keep away from heat, spark and flames.

10.5 Incompatible Materials

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

10.6 Hazardous Decomposition Products

hydrogen chloride HCl, hydrogen fluoride HF, carbon monoxide CO, carbonyl chloride COCl2, carbonyl fluoride COF2, chlorine Cl2

11. Toxicological Information

11. 1 Information on Toxicological Effects

Acute toxicity

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Difluoromethane (CAS 75-10-5)	-	-	-
Pentafluoroethane (CAS 324-33-6)	-	-	> 800 000 ppm
Chlorodifluoromethane (75-45-6)	-	-	250 000 ppm - 4hr

Source: ECHA

Local effect

Inhalation In high concentrations it acts as narcotic and asphyxiant.
Eye contact May cause frostbite
Skin contact May cause frostbite
Ingestion Not classified

Chronic toxicity

Skin Corrosion/Irritation May cause frostbite.
Eye damage/irritation May cause frostbite.
Sensitization Not classified
Mutagenic effects Not classified
Carcinogenic effects Not classified
Reproductive effects Not classified
STOT - Single Exposure Not classified
STOT - repeated exposure Not classified
Aspiration hazard Not classified

Other Hazard

No additional information available

12. Ecological Information

12.1 Ecotoxicity

Chemical Name	Toxicity to Fish LC50 96HR	Toxicity to Daphnia and other aquatic invertebrate EC50 48HR	Toxicity to Algae ErC50 72HR
Difluoromethane (CAS 75-10-5)	1731 mg/L	833 mg/L	313 mg/L
Pentafluoroethane (CAS 354-33-6)	100 mg/L	100 mg/L	114 mg/L

Chlorodifluoromethane (CAS 75-45-6)	-	433 mg/L	-

Source: ECHA

12.2 Persistence and Degradability

No further relevant information available.

12.3 Bioaccumulative Potential

Difluoromethane Log Pow = 0.21
Pentafluoroethane Log Pow = 0.48
Chlorodifluoromethane Log Pow = 1.13

Low partition coefficient (octanol-water) indicates the absence of bioaccumulation.

12.4 Mobility in Soil

No information available

12.5 Results of PBT and vPvB Assessment

No data available for assessment.

12.6 Other Adverse Effects

No further relevant information available

13. Disposal Considerations

13.1 Waste Treatment Methods

Waste from Residues / Unused Products Disposal should be in accordance with applicable local/regional/national and international laws and regulations.

Contaminated packaging Do not reuse empty containers. Dispose of contents/container to licensed hazardous or special waste collection point. Dispose of unused product.

14. Transport Information

IMDG/IMO

UN-No	UN 3340
Proper Shipping name	REFRIGERANT GAS R 407C
Hazard class	2.2
Packing group	-
Environmental Hazard	No

IATA/ICAO

UN-No	UN 3340
Proper Shipping name	REFRIGERANT GAS R 407C
Hazard class	2.2
Packing group	-
Environmental Hazard	No

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

International Inventories

TSCA	Complies
EINECS/ ELINCS	Complies
DSL/NDSL	Complies
PICCS	Complies
ENCS	Complies
IECSC	Complies
AICS	Complies
KECL	Complies

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
AICS - Australian Inventory of Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance.

16. Other Information

Full text of H-Statements referred to under sections 2 and 3.

H280 Contains gas under pressure, may explode if heated

Preparation Date	23-09-2021
Revision Date	23-09-2021
Revision Note	Not applicable

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

End of Safety Data Sheet