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Version number 2

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**\* SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name: FLUOROCARBON GAS R-410A****Article number: R-410A****Product name : REFRIGERANT GAS N.O.S.(DIFLUOROMETHANE,PENTAFLUOROETHANE)****1.2 Relevant identified uses of the substance or mixture and uses advised against: Refrigerant****1.3 Details of the supplier of the safety data sheet DCC-10037****Manufacturer/Supplier:****DAIKIN FLUOROCHEMICALS (CHINA) CO.,LTD.**

No.8 Jinyu Road (West) Advanced Materials Industrial Park, Changshu, Jiangsu 215522, China

Phone: (+86) 512-5232-2266

**Further information obtainable from: <http://www.daikinchem.com.cn>****1.4 Emergency telephone number: (+86) 532-8388-9090****\* SECTION 2: Hazard identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008***Press. Gas (Comp.) H280 Contains gas under pressure; may explode if heated.***2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008:***The product is classified and labelled according to the CLP regulation.***Signal word: Warning****Precautionary statements:***P410+P403 Protect from sunlight. Store in a well-ventilated place.***\* SECTION 3: Composition/information on ingredients****Information on ingredients:**

CAS: 75-10-5	Difluoromethane	50%
	Flam. Gas 1A, H220	
	Press. Gas (Liq.), H280	

CAS: 354-33-6	Pentafluoroethane	50%
	Press. Gas (Liq.), H280	

**Additional information:** For the wording of the listed hazard phrases refer to section 16.**SECTION 4: First aid measures****4.1 Description of first aid measures****General information:** Seek immediate medical advice.**After inhalation:***Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult a doctor if symptoms persist.**In case of unconsciousness place patient stably in side position for transportation.**In case of emergency to rescue the victims; be sure to wear supplied-air respirator (SAR) or self-contained breathing apparatus (SCBA).***After skin contact:***Rinse with warm water.**In cases of frost bites, rinse with plenty of water. Do not remove clothing.**Immediately rinse with warm water and soap.**Consult a doctor in case of complaints.***After eye contact:***Rinse opened eye for several minutes under running water.**Consult an ophthalmologist in case of complaints.***After swallowing:** Not applicable.

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**Trade name: FLUOROCARBON GAS R-410A****Information for doctor:**

Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

The examining physician should advise workers taking medications containing catecholamines that they may be at increased risk and should avoid excessive exposure.

**4.2 Most important symptoms and effects, both acute and chronic:**

Frost bites

High concentrations cause asphyxiation. May cause an abnormal heart rhythm and prove suddenly fatal.

**4.3 Indication of any immediate medical attention and special treatment needed:**

No further relevant information available.

**\* SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing agents:**

CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**5.2 Special hazards arising from the substance or mixture:**

Hydrogen fluoride (HF)

Formation of toxic gases is possible during heating or in case of fire.

Receptacle may explode when heated.

**5.3 Advice for firefighters:**

Remove receptacles from area of fire if possible.

If possible, close valves of receptacles to shut off the gas supply.

**Protective equipment:**

Wear self-contained breathing apparatus and protective suit.

Do not inhale explosion gases or combustion gases.

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures:**

Wear appropriate protective devices (See Section 8 Exposure Controls/Personal Protection).

Avoid contact with eyes and skin.

Do not inhale the product.

Ensure adequate ventilation before entering the area.

Remove persons from danger area.

Keep out unauthorized persons.

**6.2 Environmental precautions:**

Suppress gases/fumes/haze with water spray.

Do not allow to enter sewers/surface or ground water.

Must not be emitted into the environment.

**6.3 Methods and material for containment and cleaning up:** Ensure adequate ventilation.

**6.4 Reference to other sections:**

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

**\* SECTION 7: Handling and storage****7.1 Precautions for safe handling:**

Waste air is to be released into the atmosphere only via suitable separators.

Ensure good ventilation/exhaustion at the workplace.

Handle with care. Avoid jolting, friction and impact.

Stay on the windward side when working outdoors.

Inhaling large quantities may cause cardiac arrhythmia or asphyxiation or both.

Keep away from naked flame or metal heated over 300 - 400 °C to prevent thermal decomposition that may form toxic gases.

Do not handle until all safety precautions have been read and understood.

**Information about fire - and explosion protection:**

The product is not flammable.

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

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Keep respiratory protective device available.

**7.2 Conditions for safe storage, including any incompatibilities:**

**Storage**

**Requirements to be met by storerooms and receptacles:**

Store only in unopened original receptacles.

Store in a cool and dry location.

Keep containers tightly sealed.

**Information about storage in one common storage facility:**

See section 10 for information on incompatible materials.

**Further information about storage conditions:**

Protect from heat and direct sunlight.

Store containers in a well ventilated area.

Store locked up.

**7.3 Specific end use(s):** No further relevant information available.

\* **SECTION 8: Exposure controls/personal protection**

**8.1 Control parameters** No further information available.

**Additional information about design of technical facilities:** No further data; see item 7.

**Ingredients with limit values that require monitoring at the workplace:**

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

**8.2 Exposure controls**

**Personal protective equipment**

**General protective and hygienic measures:**

Wash hands before breaks and at the end of work.

Do not eat or drink while working.

Do not smoke.

**Respiratory protection:** Use respiratory protective device with organic gas cartridge.

**Protection of hands:**



Protective gloves

**Material of gloves:** Leather

**Eye protection:**



Safety glasses

**Body protection:** Protective work clothing

**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

**General Information**

**Appearance**

**Form:** Liquefied gas

**Colour:** Colourless

**Odour:** Ether-like

**pH-value:** Not applicable.

**Melting point/freezing point:** No further information available.

**Initial boiling point and boiling range:** -52 °C

**Flash point:** Not applicable.

**Flammability (solid, gas):** Product is not flammable.

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**Explosion limits:****Lower explosive limit:** No further information available.**Upper explosive limit:** No further information available.**Vapour pressure at 25 °C:** 1.65 MPa**Density:****Relative density at 25 °C** 1.06 g/cm<sup>3</sup>**Vapour density** Not determined.**Solubility in / Miscibility with water:**

No further information available.

**Partition coefficient: n-octanol/water:** No further information available.**9.2 Other information:** No further relevant information available.**SECTION 10: Stability and reactivity****10.1 Reactivity** No further relevant information available.**10.2 Chemical stability****Thermal decomposition / conditions to be avoided:** To avoid thermal decomposition do not overheat.**10.3 Possibility of hazardous reactions:** No dangerous reactions known under normal conditions of use.**10.4 Conditions to avoid:** Keep away from heat, sparks, flame, high temperature.**10.5 Incompatible materials:** Alkali or alkaline earth metals - powdered Al, Zn, Mg, etc.**10.6 Hazardous decomposition products:** Hydrofluoric acid, carbonyl fluoride**\* SECTION 11: Toxicological information****11.1 Information on toxicological effects****Acute toxicity** no data**LD/LC50 values relevant for classification:****CAS: 354-33-6 Pentafluoroethane****Inhalative LC0/ 4h** >800000 ppm (Rat)**CAS: 75-10-5 Difluoromethane****Inhalative LC50/ 4h** 1107000 mg/m<sup>3</sup> (Rat)**Primary irritant effect****Skin corrosion/irritation** No further information available.**Serious eye damage/irritation** No further information available.**after inhalation:** No further information available.**Respiratory or skin sensitisation** No further information available.**Other information (about experimental toxicology):** No further information available.**Subacute to chronic toxicity** No further information available.**Additional toxicological information:****CMR effects****Germ cell mutagenicity****In vitro tests** did not show mutagenic effects.(Pentafluoroethane)**In vivo tests** did not show mutagenic effects.(Pentafluoroethane)**Carcinogenicity** Based on available data, the classification criteria are not met.**Reproductive toxicity****No toxicity to reproduction** (Pentafluoroethane)**Inhalation, mouse, 208000 mg/m<sup>3</sup>, Effect on fertility, NOAEC** (Difluoromethane)**foetotoxic effect** (Difluoromethane)**STOT-single exposure** Based on available data, the classification criteria are not met.**STOT-repeated exposure** Based on available data, the classification criteria are not met.**Aspiration hazard**

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**\* SECTION 12: Ecological information****12.1 Toxicity***Aquatic toxicity: No further relevant information available.***12.2 Persistence and degradability:** *No further relevant information available.***Abiotic degradation:***Air, indirect photo-oxidation, t 1/2 from 4.16-28.2 y**Conditions: sensitizer: OH radicals**Degradation products: Carbon dioxide (CO<sub>2</sub>)/hydrofluoric acid/ TFA***12.3 Bioaccumulative potential:***Due to the distribution coefficient n-octanol/water an accumulation in organisms is not expected.***12.4 Mobility in soil:** *No further relevant information available.***General notes:***Ozone depletion potential(ODP) : 0(CFC-11 1.0)**Global warming potential(GWP) : 1700(CO<sub>2</sub>=1 100years integrated value)***12.5 Results of PBT and vPvB assessment****PBT:***No further relevant information available.**Not applicable.***vPvB:***No further relevant information available.**Not applicable.***12.6 Other adverse effects:** *No further relevant information available.***SECTION 13: Disposal considerations****13.1 Waste treatment methods****Recommendation:** *Disposal must be made according to official regulations.***Uncleaned packaging****Recommendation:** *Disposal must be made according to official regulations.***SECTION 14: Transport information****14.1 UN-Number:****ADR, IMDG, IATA**

UN1078

**14.2 UN proper shipping name:****ADR:**

1078 REFRIGERANT GAS, N.O.S.

**IMDG, IATA**

REFRIGERANT GAS, N.O.S.

**14.3 Transport hazard class(es):****ADR, IMDG, IATA****Class:**

2.2

**Label:**

2.2

**14.4 Packing group:****ADR:**

Not applicable

**14.5 Environmental hazards:**

Not applicable.

**Marine pollutant:**

No

**14.6 Special precautions for user:**

Not applicable.

**Hazard identification number (Kemler code):**

20

**14.7 Transport in bulk according to Annex II of****MARPOL73/78 and the IBC Code:**

Not applicable.

**Transport/Additional information:***Avoid direct sunlight. Make sure of no damage, corrosion, leaks on the receptacles.**Take necessary measures for preventing cargo shift.*

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**ADR**

Excepted quantities (EQ)

Code: E1

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 1000 ml

C/E

Tunnel restriction code:

**IMDG**

Excepted quantities (EQ)

Code: E1

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 1000 ml

UN "Model Regulation":

UN1078, REFRIGERANT GAS, N.O.S., 2.2

**\* SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture  
Labelling according to Regulation (EC) No 1272/2008**

The product is classified and labelled according to the CLP regulation.

**Hazard pictograms**

GHS04

**Signal word** Warning**Hazard statements**

H280 Contains gas under pressure; may explode if heated.

**Precautionary statements**

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

**National regulations** No further information available.**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.**SECTION 16: Other information**

The product is for the industrial use only. We do not guarantee the safety in case the product is used for the other purposes. When using the product for health-care application or food/feed application, consult us in advance. This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Department issuing SDS:** SAFETY&ENVIRONMENT DEPT.**Contact:** <http://www.daikinchem.com.cn>**Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Gas 2: Flammable gases – Category 2

Press. Gas (Comp.): Gases under pressure – Compressed gas

Press. Gas (Liq.): Gases under pressure – Liquefied gas

**\* Data compared to the previous version altered.**