

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

*** SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name:** FLUOROCARBON GAS HFC-32**Synonyms:** HFC-32 Product name : REFRIGERANT GAS R32**EC number:**

200-839-4

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-10025****Manufacturer/Supplier:**

DAIKIN FLUORO-CHEMICALS (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**

Flam. Gas 1A H220 Extremely flammable gas.

Press. Gas (Liq.) H280 Contains gas under pressure; may explode if heated.

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008:**

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

Signal word: Danger**Precautionary statements:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

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

100%

Flam. Gas 1A H220

Press. Gas (Liq.), H280

EC number: 200-839-4*** SECTION 4: First aid measures****4.1 Description of first aid measures****General information:** Seek immediate medical advice.**After inhalation:**

Take affected persons into fresh air. Keep at rest.

Supply fresh air or oxygen; call for doctor.

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:

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.

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32**After eye contact:**

Rinse opened eye for several minutes under running water.

Consult an ophthalmologist in case of complaints.

After swallowing: Not applicable.

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:**

CO₂, 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.

Extremely flammable; can ignite easily with heat, sparks, fire.

5.3 Advice for firefighters:

Remove receptacles from area of fire if possible.

If fire extinguishing is impossible, protect the outskirts and burn it until materials disappear.

Protective equipment:

Wear fully protective suit.

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:**

Keep away from ignition sources.

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.

Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions:

Suppress gases/fumes/haze with water spray.

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

Inform authorities in case of gas release.

Must not be emitted into the environment.

6.3 Methods and material for containment and cleaning up:

Allow to evaporate.

Ensure adequate ventilation.

Remove ignition sources immediately.

There is a danger of explosion. Prepare fire extinguisher in case of emergency.

6.4 Reference to other sections:

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32

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

Store in cool, dry place in tightly closed receptacles.

Open and handle receptacle with care.

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:

Do not spray onto a naked flame or any incandescent material.

Use only in explosion protected area.

Use explosion-proof apparatus / fittings and spark-proof tools.

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

Keep respiratory protective device available.

Use flame proof electric/lighting devices and ventilation equipment.

Ground/bond container and receiving equipment.

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:

Store away from flammable substances.

Store away from oxidising agents.

See section 10 for information on incompatible materials.

Further information about storage conditions:

Store in cool, dry conditions in well sealed receptacle.

Protect from humidity and water.

Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.

Protect from heat and direct sunlight.

Store containers in a well ventilated area.

Store locked up.

Maximum storage temperature: 40 °C

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: Not required.

DNELs:

HFC-32

Inhalative DNEL - worker 7035 mg/m³ (long-term exposure) (systemic effects)

DNEL - consumer 750 mg/m³ (long-term exposure) (systemic effects)

CAS: 75-10-5 Difluoromethane

Inhalative DNEL - worker 7035 mg/m³ (long-term exposure) (systemic effects)

DNEL - consumer 750 mg/m³ (long-term exposure) (systemic effects)

Inhalative

DNEL - general population 750 mg/m³ (long-term exposure) (systemic effects)

DNEL - worker 7035 mg/m³ (long-term exposure) (systemic effects)

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32**PNECs:****HFC-32**

PNEC 0.142 mg/l (fresh water)

1.42 mg/l (intermittent release)

PNEC 0.534 mg/kg dw (fresh water sediment)

CAS: 75-10-5 Difluoromethane

PNEC 0.142 mg/l (fresh water)

1.42 mg/l (intermittent release)

PNEC 0.534 mg/kg dw (fresh water sediment)

PNEC

0.142 mg/l (freshwater) (aqua)

0.534 mg/kg dw (freshwater) (sediment)

1.42 mg/l (intermittent release) (aqua)

Additional information: The lists valid during the making were used as basis.**8.2 Exposure controls****Personal protective equipment****General protective and hygienic measures:**

Avoid skin contact with the liquefied material.

Wash hands before breaks and at the end of work.

Do not eat or drink while working.

Respiratory protection:

Use suitable respiratory protective device in case of insufficient ventilation.

Self-contained respiratory protective device.

Use respiratory protective device with organic gas cartridge.

Protection of hands:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.



Protective gloves

To avoid skin problems reduce the wearing of gloves to the required minimum.

Material of gloves:

Strong material 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:**

Compressed liquefied gas

Colour:

Colourless

Odour:

Odourless

Odour threshold:

Not determined.

pH-value:

Neutral

Melting point/freezing point:

-136 °C

Initial boiling point and boiling range:

-51.6 °C

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32

Flash point:	Not applicable.
Flammability (solid, gas):	Extremely flammable liquefied gas.
Fundamental burning velocity:	6.7 cm/s
Decomposition temperature:	No further information available.
Auto-ignition temperature:	Not determined.
Explosive properties:	Not determined.
Explosion limits:	
Lower explosive limit:	13.8 Vol % 13.8 Vol% (High Pressure Gas Safety Act: Japan)
Upper explosive limit:	29.9 Vol % 29.9 Vol% (High Pressure Gas Safety Act: Japan)
Vapour pressure at 25 °C:	1701 kPa
Density at 25 °C:	0.959 g/cm ³
Relative density at 25 °C	0.0021 (calculated)
Vapour density	1.18
Evaporation rate	Not applicable.
Solubility in / Miscibility with water at 25 °C:	1680 mg/l 1680 mg / l (25 °C atmospheric pressure)
Partition coefficient: n-octanol/water at 25 °C:	0.21
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
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:

No decomposition if used and stored according to specifications.

To avoid thermal decomposition do not overheat.

10.3 Possibility of hazardous reactions:

Danger of receptacles bursting because of high vapour pressure when heated.

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:

Poisonous gases/vapours

Hydrofluoric acid, carbonyl fluoride

* SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:

HFC-32

Inhalative LC50/4h 1107000 mg/m³ (Rat) (OECD 403)

CAS: 75-10-5 Difluoromethane

Inhalative ALC/4h >760000 ppm (Rat)

LC50/4h 1107000 mg/m³ (Rat) (520000 ppm; OECD 403)

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32**Primary irritant effect****Skin corrosion/irritation**

No further information available.

CAS: 75-10-5 Difluoromethane

Inhalative Development 50000 ppm (Rat and rabbit)

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:****CAS: 75-10-5 Difluoromethane**

Inhalative Cardiac sensitive 350000 ppm (Dog)

Cardiotoxicity: NOAEC: 735000 mg/m³ (dog)

No cardiac sensitisation potential of HFC-32 (up to 35% v/v in air) to adrenaline in dogs.

Repeated dose toxicity NOAEC (inhalation): 105000 mg/m³ (rat) (OECD 413)**CMR effects****Mutagenicity:**

Ames test: negative (OECD 471)

In vitro mammalian chromosome aberration test: negative (OECD 473)

Mammalian erythrocyte micronucleus test: negative (OECD 474)

Toxicity for reproduction:NOAEC (inhalation): 208000 mg/m³ (mouse) (OECD 478; read across)**Developmental toxicity:**NOAEC (inhalation): 105000 mg/m³ (rat)**Germ cell mutagenicity** Based on available data, the classification criteria are not met.**Carcinogenicity** Based on available data, the classification criteria are not met.**Reproductive toxicity****HFC-32**Inhalative NOAEC 208000 mg/m³ (Mouse) (OECD 478, read across)105000 mg/m³ (Rat) (developmental toxicity)**CAS: 75-10-5 Difluoromethane**Inhalative NOAEC 208000 mg/m³ (Mouse)

Based on available data, the classification criteria are not met.

STOT-single exposure Based on available data, the classification criteria are not met.**STOT-repeated exposure****HFC-32**Inhalative NOAEC 105000 mg/m³ (Rat) (OECD 413)**CAS: 75-10-5 Difluoromethane**Inhalative NOAEC 105000 mg/m³ (Rat) (OECD 413)

Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.*** SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:****HFC-32**

LC50/96h 1507 mg/l (Fish) (QSAR)

LC50/48h 652 mg/l (Daphnia) (QSAR)

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32*EC50/96h 142 mg/l (Alga) (QSAR)***CAS: 75-10-5 Difluoromethane***LC50/96h 1507 mg/l (Fish) (QSAR)**LC50/48h 652 mg/l (Daphnia) (QSAR)**EC50/96h 142 mg/l (Alga) (QSAR)**EC50/96 h 142 mg/l (algae) (QSAR)**LC50/48 h 652 mg/l (daphnia) (QSAR)**LC50/96 h 1507 mg/l (fish) (QSAR)***12.2 Persistence and degradability:***Not easily biodegradable**5% after 28 days (OECD 301 D)**5% / 28 days (OECD 301D)***Abiotic degradation:***Air (indirect photo-oxidation): Half life: 3.39 years**Conditions: sensitizer: OH radicals**Degradation products: Carbon dioxide (CO₂) / hydrofluoric acid**Water, pH = 7**Hydrolyses slowly on contact with water.***Behaviour in environmental systems****Components:** *Half-life in air: 1237 days***12.3 Bioaccumulative potential:***Due to the distribution coefficient n-octanol/water an accumulation in organisms is not expected.**log Pow = 0.21***12.4 Mobility in soil:****CAS: 75-10-5 Difluoromethane***Henry's law constant 295 hPa*m³/mol (air) (25 °C)**log Koc 0.17 (soil)***Other information***Koc = 1.49 - 21-73 (QSAR)**log Koc = 0.17 - 1.34 (QSAR)***Ecotoxicological effects:** *no data***General notes:***Ozone depletion potential(ODP) : 0**Global warming potential(GWP) : 675 / IPCC Fourth Assessment Report (AR4)***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.**Incineration in an adequate incinerator is recommended.***Uncleaned packaging****Recommendation:** *Disposal must be made according to official regulations.**** SECTION 14: Transport information****14.1 UN-Number:****ADR, IMDG, IATA**

UN3252

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32

14.2 UN proper shipping name:

ADR, IMDG

IATA:

DIFLUOROMETHANE (REFRIGERANT GAS R 32)

Difluoromethane

14.3 Transport hazard class(es):

ADR



Class:

2 2F Gases.

Label:

2.1

IMDG, IATA



Class:

2.1

Label:

2.1

14.4 Packing group:

ADR, IMDG, IATA

Not applicable

14.5 Environmental hazards:

Not applicable.

Marine pollutant:

No

14.6 Special precautions for user:

Warning: Gases.

Hazard identification number (Kemler code):

23

Stowage Category

D

Stowage Code

SW2 Clear of living quarters.

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.

ADR

Limited quantities (LQ):

0

Excepted quantities (EQ)

Code: E0

Not permitted as Excepted Quantity

Transport category:

2

Tunnel restriction code:

B/D

IMDG

Limited quantities (LQ)

0

Excepted quantities (EQ)

Code: E0

Not permitted as Excepted Quantity

UN "Model Regulation":

UN 3252 DIFLUOROMETHANE (REFRIGERANT GAS R 32), 2.1

*** SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

No further relevant information available.

Labelling according to Regulation (EC) No 1272/2008

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

Hazard pictograms

GHS02

Signal word Danger

Printing date 09.02.2021

Version number 1

Revision: 09.02.2021

Trade name: FLUOROCARBON GAS HFC-32**Hazard statements***H220 Extremely flammable gas.**H280 Contains gas under pressure; may explode if heated.***Precautionary statements***P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.**P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.**P381 In case of leakage, eliminate all ignition sources.**P410+P403 Protect from sunlight. Store in a well-ventilated place.***National regulations** *No further information available.***Other regulations, limitations and prohibitive regulations:***High Pressure Gas Safety Act (Japan) : non-flammable gas**ISO817 : Classification A2L (lower flammability)***15.2 Chemical safety assessment:** *A Chemical Safety Assessment has 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**EINECS: European Inventory of Existing Commercial Chemical Substances**DNEL: Derived No-Effect Level (REACH)**PNEC: Predicted No-Effect Concentration (REACH)**LC50: Lethal concentration, 50 percent**LD50: Lethal dose, 50 percent**PBT: Persistent, Bioaccumulative and Toxic**vPvB: very Persistent and very Bioaccumulative**Flam. Gas 1A: Flammable gases – Category 1A**Press. Gas (Liq.): Gases under pressure – Liquefied gas**** Data compared to the previous version altered.**