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*** SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name:** DAIFLON GAS HFC-32EH**Article number:** HFC32EH**EC number:**

200-839-4

1.2 Relevant identified uses of the substance or mixture and uses advised against:

No further relevant information available.

1.3 Details of the supplier of the safety data sheet**Manufacturer/Supplier:**

DAIKIN INDUSTRIES, LTD. CHEMICALS DIVISION:

OSAKA UMEDA TWIN TOWERS SOUTH, 1-13-1 Umeda, Kita-ku, Osaka-shi, Osaka, 530-0001, Japan

Phone: +81-6-6147-9702 Fax: +81-6-6147-9807

Further information obtainable from: <http://www.daikin.com/>**1.4 Emergency telephone number:**

Japan: +81-6-6349-7521

China: +86-532-8388-9090, +86-21-34151689

South Korea: +82-2-568-1722

Americas: CHEMTREC +1-800-424-9300 (Outside US/Canada: +1-703-527-3887)

Europe: +49-211-179 225-0

*** SECTION 2: Hazard identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

Flam. Gas 1B H221 Flammable gas.

Flam. Category: 1B, Hazard statement code: 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

≥99.9%

Flam. Gas 1B, H221

Press. Gas (Liq.), H280

Identification number(s)**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. If required, provide artificial respiration. Keep patient warm. Consult a doctor if symptoms persist.

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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).

If the patient does not breathe or hardly breathes, unbutton clothes, secure the airway for breathing and perform artificial respiration.

At high levels, cardiac arrhythmia may occur.

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.

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.

Water haze

Water spray

Fire-extinguishing powder

Dry sand

CO₂

5.2 Special hazards arising from the substance or mixture:

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:

Move receptacle to a safe place immediately if possible. If not, spray water on the receptacles and surrounding equipment to cool.

If receptacle catches fire: cool them with plenty of water.

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

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:**

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.

Stay on the windward side.

Keep out unauthorized persons.

Wear protective equipment. Keep unprotected persons away.

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Trade name: DAIFLON GAS HFC-32EH**6.2 Environmental precautions:***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.**Remove ignition sources immediately.**Ground all equipment when the product leaks.**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.**** SECTION 7: Handling and storage****7.1 Precautions for safe handling:***Waste air is to be released into the atmosphere only via suitable separators.**Open and handle receptacle with care.**Ensure good ventilation/exhaustion at the workplace.**Handle with care. Avoid jolting, friction and impact.**For heating receptacle, use hot compresses or lukewarm water below 40 °C.**Do not use heaters.**Stay on the windward side when working outdoors.**Be careful of leakage when attaching/detaching receptacles.**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:***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:***Not required.**See section 10 for information on incompatible materials.***Further information about storage conditions:***Store in cool, dry conditions in well sealed receptacle.**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.**Ingredients with limit values that require monitoring at the workplace:** Not required.**DNELs:****CAS: 75-10-5 Difluoromethane****Inhalative DNEL - worker** 7,035 mg/m³ (long-term exposure) (systemic effects)

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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)

PNECs:
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

Appropriate engineering controls No further data; see section 7.

Individual protection measures, such as 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.

Keep away from tobacco products.

Respiratory protection:

Wear respirator for organic gases, where leakage may occur.

Use suitable respiratory protective device in case of insufficient ventilation.

Use respiratory protective device with organic gas cartridge.

Hand protection

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

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Leather

Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye/face 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
Physical state

Liquefied gas

Colour:

Colourless

Odour:

Odourless

Odour threshold:

Not determined.

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Melting point/freezing point:	-136 °C
Boiling point or initial boiling point and boiling range	-51.7 °C
Flammability	No data.
Lower and upper explosion limit	
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)
Flash point:	Not applicable.
Auto-ignition temperature:	No further information available.
Decomposition temperature:	No further information available.
pH	Not determined.
Viscosity:	
Kinematic viscosity	Not determined.
Dynamic:	Not determined.
Solubility	
water at 25 °C:	1680 g/l
	1680 mg / l (25 °C atmospheric pressure)
Partition coefficient n-octanol/water (log value)	0.21 log POW
Vapour pressure at 25 °C:	1.69 MPa
Density and/or relative density	
Density:	0.961 g/cm ³
Relative density	Not determined.
Vapour density	Not determined.
Particle characteristics	No further information available.
9.2 Other information:	
Form:	Liquefied gas
Ignition temperature:	530 °C (1018hPa)
Explosive properties:	Not determined.
Evaporation rate	Not applicable.
Information with regard to physical hazard classes	
Explosives	Not applicable
Flammable gases	Flammable gas.
Aerosols	Not applicable
Oxidising gases	Not applicable
Gases under pressure	Contains gas under pressure; may explode if heated.
Flammable liquids	Not applicable
Flammable solids	Not applicable
Self-reactive substances and mixtures	Not applicable
Pyrophoric liquids	Not applicable
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Not applicable
Substances and mixtures, which emit flammable gases	
in contact with water	Not applicable
Oxidising liquids	Not applicable
Oxidising solids	Not applicable
Organic peroxides	Not applicable
Corrosive to metals	Not applicable
Desensitised explosives	Not applicable

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:

Reacts with alkali and metals.

No dangerous reactions known under normal conditions of use.

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Trade name: DAIFLON GAS HFC-32EH**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 hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity** Based on available data, the classification criteria are not met.**LD/LC50 values relevant for classification:****CAS: 75-10-5 Difluoromethane**

Inhalative LC0/4h > 520000 ppm (Rat) (OECD403)

Skin corrosion/irritation:

No further information available.

CAS: 75-10-5 Difluoromethane

Inhalative Development 50,000 ppm (Rat and rabbit)

Serious eye damage/irritation: No further information available.**after inhalation:** No further information available.**Respiratory or skin sensitisation:** Based on available data, the classification criteria are not met.**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:****CAS: 75-10-5 Difluoromethane**Inhalative NOAEC 208,000 mg/m³ (Mouse)**STOT-single exposure:** Based on available data, the classification criteria are not met.**STOT-repeated exposure:****CAS: 75-10-5 Difluoromethane**Inhalative NOAEC 105,000 mg/m³ (Rat) (OECD 413)**Aspiration hazard:** Based on available data, the classification criteria are not met.**Other information (about experimental toxicology):**

Chromosomal Aberration Study in vitro- Negative

Mouse Micronucleus Assay in Vivo - Negative

Subacute to chronic toxicity: No further information available.**Additional toxicological information:****CAS: 75-10-5 Difluoromethane**

Inhalative Cardiac sensitive 350,000 ppm (Dog)

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)

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*** SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:****CAS: 75-10-5 Difluoromethane**

LC50/96h 1,507 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)

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.

Other information

Koc = 1.49 - 21-73 (QSAR)

log Koc = 0.17 - 1.34 (QSAR)

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)

12.5 Results of PBT and vPvB assessment**PBT:** Not applicable.**vPvB:** Not applicable.**12.7 Other adverse effects:****Ecotoxicological effects:** no data**Additional ecological information:****General notes:**

Ozone depletion potential(ODP) : 0

Global warming potential(GWP) : 675 / IPCC Fourth Assessment Report (AR4)

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Recommendation:**

Must be specially treated adhering to official regulations.

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 or ID number****ADR, IMDG, IATA**

UN3252

14.2 UN proper shipping name:**ADR, IMDG, IATA**

DIFLUOROMETHANE (REFRIGERANT GAS R 32)

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14.3 Transport hazard class(es):

ADR



Class: 2 Gases.
Label: 2.1
IMDG, IATA



Class: 2.1 Gases.
Label: 2.1

14.4 Packing group:

IMDG, IATA Not applicable

14.5 Environmental hazards:

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 Maritime transport in bulk according to IMO instruments

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

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

Hazard statements

H221 Flammable gas.

H280 Contains gas under pressure; may explode if heated.

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Trade name: DAIFLON GAS HFC-32EH**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.

Seveso category P2 FLAMMABLE GASES

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 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: EHS Department

Contact: <http://www.daikin.com/>

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 relatif au transport international 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 1B: Flammable gases – Category 1B

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

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