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Version number 1

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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:**

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

*Water haze*

*Water spray*

*Fire-extinguishing powder*

*Dry sand*

*CO<sub>2</sub>*

**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/m<sup>3</sup> (long-term exposure) (systemic effects)

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**Trade name: DAIFLON GAS HFC-32EH***DNEL - consumer 750 mg/m<sup>3</sup> (long-term exposure) (systemic effects)**Inhalative**DNEL - general population 750 mg/m<sup>3</sup> (long-term exposure) (systemic effects)**DNEL - worker 7035 mg/m<sup>3</sup> (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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<b>Melting point/freezing point:</b>	-136 °C
<b>Boiling point or initial boiling point and boiling range</b>	-51.7 °C
<b>Flammability</b>	No data.
<b>Lower and upper explosion limit</b>	
<b>Lower explosive limit:</b>	13.8 Vol % 13.8 Vol% (High Pressure Gas Safety Act: Japan)
<b>Upper explosive limit:</b>	29.9 Vol % 29.9 Vol% (High Pressure Gas Safety Act: Japan)
<b>Flash point:</b>	Not applicable.
<b>Auto-ignition temperature:</b>	No further information available.
<b>Decomposition temperature:</b>	No further information available.
<b>pH</b>	Not determined.
<b>Viscosity:</b>	
<b>Kinematic viscosity</b>	Not determined.
<b>Dynamic:</b>	Not determined.
<b>Solubility</b>	
<b>water at 25 °C:</b>	1680 g/l 1680 mg / l (25 °C atmospheric pressure)
<b>Partition coefficient n-octanol/water (log value)</b>	0.21 log POW
<b>Vapour pressure at 25 °C:</b>	1.69 MPa
<b>Density and/or relative density</b>	
<b>Density:</b>	0.961 g/cm <sup>3</sup>
<b>Relative density</b>	Not determined.
<b>Vapour density</b>	Not determined.
<b>Particle characteristics</b>	No further information available.
<b>9.2 Other information:</b>	
<b>Form:</b>	Liquefied gas
<b>Ignition temperature:</b>	530 °C (1018hPa)
<b>Explosive properties:</b>	Not determined.
<b>Evaporation rate</b>	Not applicable.
<b>Information with regard to physical hazard classes</b>	
<b>Explosives</b>	Not applicable
<b>Flammable gases</b>	Flammable gas.
<b>Aerosols</b>	Not applicable
<b>Oxidising gases</b>	Not applicable
<b>Gases under pressure</b>	Contains gas under pressure; may explode if heated.
<b>Flammable liquids</b>	Not applicable
<b>Flammable solids</b>	Not applicable
<b>Self-reactive substances and mixtures</b>	Not applicable
<b>Pyrophoric liquids</b>	Not applicable
<b>Pyrophoric solids</b>	Not applicable
<b>Self-heating substances and mixtures</b>	Not applicable
<b>Substances and mixtures, which emit flammable gases</b>	
<b>in contact with water</b>	Not applicable
<b>Oxidising liquids</b>	Not applicable
<b>Oxidising solids</b>	Not applicable
<b>Organic peroxides</b>	Not applicable
<b>Corrosive to metals</b>	Not applicable
<b>Desensitised explosives</b>	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 &gt; 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/m<sup>3</sup> (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/m<sup>3</sup> (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/m<sup>3</sup> (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/m<sup>3</sup> (mouse) (OECD 478; read across)**Developmental toxicity:**NOAEC (inhalation): 105000 mg/m<sup>3</sup> (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\*m<sup>3</sup>/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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Trade name: DAIFLON GAS HFC-32EH

**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.**