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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name:** HFC-32**Article number:** HFC32**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.



Gases Under Pressure-Liquified 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 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.

At high levels, cardiac arrhythmia may occur.

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**Trade name: HFC-32****After skin contact:**

Immediately wash with water and soap and rinse thoroughly.

In cases of frost bites, rinse with plenty of water. Do not remove clothing.

**After eye contact:** Rinse opened eye for several minutes under running water.

**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.

**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.

**For safety reasons unsuitable extinguishing agents:** Water with full jet

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

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

Hydrogen fluoride (HF)

**5.3 Advice for firefighters:**

**Protective equipment:** Wear fully protective suit.

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

Stay on the windward side.

Wear protective equipment. Keep unprotected persons away.

**6.2 Environmental precautions:** Do not allow to enter sewers/surface or ground water.**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.

**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.

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

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

**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.

**Information about storage in one common storage facility:** Not required.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed receptacle.

Protect from heat and direct sunlight.

**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.

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**Trade name: HFC-32****Ingredients with limit values that require monitoring at the workplace:****CAS: 75-10-5 Difluoromethane**

WEEL (USA) 1000 ppm

**DNELs:**

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:**

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 item 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.

**Melting point/freezing point:**

-136 °C

**Boiling point or initial boiling point and boiling range** -51.7 °C

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<b>Flammability</b>	Flammable
<b>Lower and upper explosion limit</b>	No further information available.
<b>Lower explosive limit:</b>	13.8 Vol% (High Pressure Gas Safety Act: Japan)
<b>Upper explosive limit:</b>	Not determined.
<b>Flash point:</b>	29.9 Vol% (High Pressure Gas Safety Act: Japan)
<b>Ignition temperature:</b>	Not applicable.
<b>Decomposition temperature:</b>	530 °C (1018hPa)
<b>pH</b>	No further information available.
<b>Viscosity:</b>	Not determined.
<b>Kinematic viscosity</b>	Not determined.
<b>Dynamic:</b>	Not determined.
<b>Solubility</b>	
<b>water:</b>	No further information available.
<b>Partition coefficient n-octanol/water (log value)</b>	1680 mg / l (25 °C atmospheric pressure)
<b>Vapour pressure at 25 °C:</b>	0.21 log POW
<b>Density and/or relative density</b>	1.69 MPa
<b>Density at 25 °C:</b>	0.961 g/cm <sup>3</sup> (Saturated liquid)
<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>Auto-ignition temperature:</b>	Not determined.
<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>	
<b>Flammable gas.</b>	
<b>Aerosols</b>	Not applicable
<b>Oxidising gases</b>	Not applicable
<b>Gases under pressure</b>	
<b>Contains gas under pressure; may explode if heated.</b>	
<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: No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions: Reacts with alkali and metals.

10.4 Conditions to avoid: No further relevant information available.

10.5 Incompatible materials: Alkali or alkaline earth metals - powdered Al, Zn, Mg, etc.

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**Trade name: HFC-32****10.6 Hazardous decomposition products: Poisonous gases/vapours****\* 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)

**Skin corrosion/irritation:****CAS: 75-10-5 Difluoromethane**

Inhalative Cardiac sensitive 350000 ppm (Dog)

Development 50000 ppm (Rat and rabbit)

**Serious eye damage/irritation:** Based on available data, the classification criteria are not met.**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:** 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:** Based on available data, the classification criteria are not met.**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

**Additional toxicological information:****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)**11.2 Information on other hazards:****Endocrine disrupting properties:**

Substance is not listed.

**\* SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:**

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.

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**Trade name: HFC-32****Other information***Koc = 1.49 - 21-73 (QSAR)**log Koc = 0.17 - 1.34 (QSAR)***12.4 Mobility in soil:** *No further relevant information available.***12.5 Results of PBT and vPvB assessment****PBT:** *Not applicable.***vPvB:** *Not applicable.***12.6 Endocrine disrupting properties** *The product does not contain substances with endocrine disrupting properties.***12.7 Other adverse effects:****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.**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** 3252**14.2 UN proper shipping name:****ADR:** 3252 DIFLUOROMETHANE (REFRIGERANT GAS R 32)  
**IMDG, IATA** DIFLUOROMETHANE (REFRIGERANT GAS R 32)**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**14.7 Maritime transport in bulk according to IMO****instruments****Transport/Additional information:***Not applicable.**Avoid direct sunlight. Make sure of no damage, corrosion, leaks on the receptacles.**Take necessary measures for preventing cargo shift.*

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**Trade name: HFC-32****UN "Model Regulation":****UN3252, 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****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.

**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.

**DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II****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.**