

Printing date 24.03.2023

Version number 1

Revision: 24.03.2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: 6FM

Article number: 6FM

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


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



Carc. 2

H351 Suspected of causing cancer.

STOT SE 2

H371 May cause damage to the kidneys. Route of exposure: Inhalation.

STOT RE 2

H373 May cause damage to the kidneys through prolonged or repeated exposure. Route of exposure: Inhalation.



Acute Tox. 4

H332 Harmful if inhaled.

STOT SE 3

H335 May cause respiratory irritation.

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: Warning

Hazard-determining components of labelling:

Hexafluoropropene

Precautionary statements:

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P405 Store locked up.

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

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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SECTION 3: Composition/information on ingredients**Information on ingredients:**

CAS: 116-15-4 Hexafluoropropene ≥99%
Press. Gas (Comp.), H280
STOT SE 2, H371
Acute Tox. 4, H332

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).

At high levels, cardiac arrhythmia may occur.

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.

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

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: Use fire extinguishing methods suitable for surrounding conditions.

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.

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 self-contained breathing apparatus and protective suit.

Do not inhale explosion gases or combustion gases.

Wear fully protective suit.

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

Ensure adequate ventilation before entering the area.

Stay on the windward side.

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Keep out unauthorized persons.

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

Avoid contact with eyes and skin.

Do not swallow the product.

6.2 Environmental precautions:

Suppress gases/fumes/haze with water spray.

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.

Emergency response planning guideline

ERPG-1 : 10ppm

ERPG-2 : 50ppm

ERPG-3 : 500ppm

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

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 respiratory protective device available.

Keep ignition sources away - Do not smoke.

7.2 Conditions for safe storage, including any incompatibilities:**Storage****Requirements to be met by storerooms and 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**

Ingredients with limit values that require monitoring at the workplace: Not required.

DNELs:

Inhalative

DNEL - general population

0.15 mg/m³ (long-term exposure) (systemic effects)

34 mg/m³ (short-term exposure) (systemic effects)

DNEL - worker

0.62 mg/m³ (long-term exposure) (systemic effects)

46 mg/m³ (short-term exposure) (systemic effects)

PNECs:

0.033 mg/l (freshwater) (aqua)

0.279 mg/kg dw (freshwater) (sediment)

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0.334 mg/l (intermittent release) (aqua)
0.003 mg/l (marine water) (aqua)
0.028 mg/kg dw (marine water) (sediment)
0.264 mg/kg dw (soil)

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 respiratory protective device with organic gas cartridge.

Hand protection



Protective gloves

Material of 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.

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

Melting point/freezing point:

-156 °C

Boiling point or initial boiling point and boiling range

-29 °C

Flammability

Product is not flammable.

Lower and upper explosion limit

Lower explosive limit:

No further information available.

Upper explosive limit:

Not determined.

Flash point:

Not applicable.

Decomposition temperature:

No further information available.

pH

Not applicable.

Viscosity:

Kinematic viscosity

No further information available.

Solubility

water at 28 °C:

82 mg/l

Partition coefficient n-octanol/water (log value) at 20 °C

1.95 log POW (pH 7)

Vapour pressure at 20 °C:

0.64 MPa

Density and/or relative density

Density at -40 °C:

1.583 g/cm³

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Vapour density

No further information available.

Particle characteristics

No further information available.

9.2 Other information:

Form:

Liquefied gas

Auto-ignition temperature:

Product is not self-igniting.

Information with regard to physical hazard classes

Explosives

Not applicable

Flammable gases

Not applicable

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:** 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:**

Carbonyl fluoride

Hydrofluoric acid, carbonyl fluoride

SECTION 11: Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity**

Harmful if inhaled.

LD/LC50 values relevant for classification:**CAS: 116-15-4 Hexafluoropropene**

Inhalative LC50/4 h 3060 ppm (Rat)

Skin corrosion/irritation: No further information available.**Serious eye damage/irritation:** 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:**

Suspected of causing cancer.

Reproductive toxicity: Based on available data, the classification criteria are not met.**STOT-single exposure:**

May cause damage to the kidneys. Route of exposure: Inhalation.

May cause respiratory irritation.

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STOT-repeated exposure:

May cause damage to the kidneys through prolonged or repeated exposure. Route of exposure: Inhalation.

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

Other information (about experimental toxicology): Chromosomal Abberation Study in

Additional toxicological information:

Acute effects (acute toxicity, irritation and corrosivity)

NOAEL (inhalation): 859 mg/m³ (140ppm) (rat)

11.2 Information on other hazards:**Endocrine disrupting properties:**

Substance is not listed.

*** SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:****CAS: 116-15-4 Hexafluoropropene**

EC50 264.1 mg/kg (Earthworm) (14 days (QSAR; esetimated))

EC50/48 h 71.9 mg/l (Daphnia) (QSAE; estimated)

EC50/96 h 33.4 mg/l (Alga) (QSAR; estimated)

LC50/96 h 128.5 mg/l (Fish) (QSAR; estimated)

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

Other information

Dissipation half-life of parent compound in air: 6 days

Henry's law constant: 1080000 Pa m³/mol

K_{oc}(20 °C) = 47,5 l/kg (predicted)

Distribution modelling:

- Air: 100%
- Water: 0.0003%
- Soil: 0.004%
- Sediment: 0.0%

12.4 Mobility in soil: No further relevant information available.

12.5 Results of PBT and vPvB assessment

PBT: No further relevant information available.

vPvB: No further information available.

12.6 Endocrine disrupting properties For information on endocrine disrupting properties see section 11.

12.7 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 or ID number**

ADR, IMDG, IATA

UN1858

14.2 UN proper shipping name:

ADR:

1858 HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)

IMDG, IATA

HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)

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14.3 Transport hazard class(es):

ADR



Class: 2 2A Gases.
Label: 2.2
IMDG



Class: 2.2 Gases.
Label: 2.2
IATA



Class: 2 Gases.
Label: 2.2

14.4 Packing group:

ADR, IMDG, IATA Not applicable

14.5 Environmental hazards:

Marine pollutant: No

14.6 Special precautions for user: Warning: Gases.

Hazard identification number (Kemler code): 20

EMS Number: F-C,S-V

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): 120 ml

Transport category: 3

Tunnel restriction code: C/E

UN "Model Regulation": UN1858, HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216), 2.2

* 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



GHS04



GHS07



GHS08

Signal word Warning

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Hazard-determining components of labelling:

Hexafluoropropene

Hazard statements

H280 Contains gas under pressure; may explode if heated.

H332 Harmful if inhaled.

H351 Suspected of causing cancer.

H371 May cause damage to the kidneys. Route of exposure: Inhalation.

H335 May cause respiratory irritation.

H373 May cause damage to the kidneys through prolonged or repeated exposure. Route of exposure: Inhalation.

Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P405 Store locked up.

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

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organisation

ICAO-TI: Technical Instructions by the "International Civil Aviation Organisation" (ICAO)

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

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

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

Acute Tox. 4: Acute toxicity – Category 4

Carc. 2: Carcinogenicity – Category 2

STOT SE 2: Specific target organ toxicity (single exposure) – Category 2

STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2

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