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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name:** 3F MONOMER**Article number:** 3FMONO**EC number:**

201-201-8

**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 1A H220 Extremely flammable gas.



Acute Tox. 4 H332 Harmful if inhaled.

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**Hazard-determining components of labelling:**

Chlorotrifluoroethylene

**Precautionary statements:**

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

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

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

P312 Call a POISON CENTER/doctor if you feel unwell.

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

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

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

CAS: 79-38-9 Chlorotrifluoroethylene

100%

Flam. Gas 1A, H220

Acute Tox. 3, H331

STOT RE 1, H372

Press. Gas (Liq.), H280

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**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.

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.

**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.

Foam

Sand

Water haze

Fire-extinguishing powder

CO<sub>2</sub>**5.2 Special hazards arising from the substance or mixture:**

Hydrogen chloride (HCl)

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:**

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

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.

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 7 for information on safe handling.

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:**

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.

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:**

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:**

**CAS: 79-38-9 Chlorotrifluoroethylene**

WEEL (USA) Long-term value: 5 ppm

**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.

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## 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:** Use respiratory protective device with organic gas cartridge.

### Hand protection



Protective gloves

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

**Material of gloves:** 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                                           | Gaseous                           |
| Colour:                                                  | Colourless                        |
| Odour:                                                   | Odourless                         |
| Melting point/freezing point:                            | -157.5 °C                         |
| Boiling point or initial boiling point and boiling range | -27.85 °C                         |
| Flammability                                             | Flammable                         |
| Lower and upper explosion limit                          |                                   |
| Lower explosive limit:                                   | 4.6 Vol %                         |
| Upper explosive limit:                                   | 64.3 Vol %                        |
| Flash point:                                             | Not applicable.                   |
| Ignition temperature:                                    | 221 °C                            |
| Decomposition temperature:                               | No further information available. |
| pH                                                       | Not determined.                   |
| Viscosity:                                               |                                   |
| Kinematic viscosity                                      | No further information available. |
| Solubility                                               |                                   |
| water:                                                   | No further information available. |
| Partition coefficient n-octanol/water (log value)        | No further information available. |
| Vapour pressure at 20 °C:                                | 5600 hPa                          |
| Density and/or relative density                          |                                   |
| Density at 20 °C:                                        | 0.00146 g/cm <sup>3</sup>         |
|                                                          | Not determined.                   |
| Vapour density                                           | No further information available. |
| Particle characteristics                                 | No further information available. |
| 9.2 Other information:                                   |                                   |
| Form:                                                    | Gaseous                           |
| Auto-ignition temperature:                               | Spontaneously flammable in air.   |
| Explosive properties:                                    | Not determined.                   |
| Information with regard to physical hazard classes       |                                   |
| Explosives                                               | Not applicable                    |

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**Flammable gases**

Extremely 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:** 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:** No further relevant information available.**10.6 Hazardous decomposition products:** 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: 79-38-9 Chlorotrifluoroethylene**

Oral LD50 268 mg/kg (Mouse)

Inhalative LC50/4 h 1000 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:** 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.**11.2 Information on other hazards:****Endocrine disrupting properties:**

Substance is not listed.

**\* SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:** No further relevant information available.**12.2 Persistence and degradability:** No further relevant information available.**12.3 Bioaccumulative potential:** No further relevant information available.

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**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** The product does not contain substances with endocrine disrupting properties.

**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**

UN3160

### 14.2 UN proper shipping name:

**ADR:**

3160 LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.  
(TRIFLUOROCHLOROETHYLENE, STABILIZED)

**IMDG, IATA**

LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.  
(TRIFLUOROCHLOROETHYLENE, STABILIZED)

### 14.3 Transport hazard class(es):

**ADR**



**Class:**

2.3 2TF Gases.

**Label:**

2.3+2.1

**IMDG, IATA**



**Class:**

2.3 Gases.

**Label:**

2.3+2.1

### 14.4 Packing group:

**ADR, IMDG, IATA**

Not applicable

### 14.5 Environmental hazards:

**Marine pollutant:**

No

### 14.6 Special precautions for user:

Not applicable.

**Hazard identification number (Kemler code):**

263

**EMS Number:**

F-D,S-U

### 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

**Transport category:**

1

**Tunnel restriction code:**

B/D

**UN "Model Regulation":**

UN3160, LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.  
(TRIFLUOROCHLOROETHYLENE, STABILIZED), 2.3 (2.1)

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**\* 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 GHS07

**Signal word Danger****Hazard-determining components of labelling:**

Chlorotrifluoroethylene

**Hazard statements**

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

H332 Harmful if inhaled.

**Precautionary statements**

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

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

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

P312 Call a POISON CENTER/doctor if you feel unwell.

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

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

**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

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

Acute Tox. 4: Acute toxicity – Category 4

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