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Version number 1

Revision: 17.07.2019

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name: METHYL 2-FLUOROACRYLATE****Article number: MFA****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:

Umeda Center Bldg., 4-12, Nakazaki-Nishi 2-chome, Kita-Ku, Osaka, JAPAN

Phone: (+81) 6-6373-4345 Fax: (+81) 6-6373-4281

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

Japan: +81-6-6349-7521

China: +86-512-5-232-0949, +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. Liq. 2 H225 Highly flammable liquid and vapour.



Acute Tox. 3 H301 Toxic if swallowed.

Acute Tox. 3 H311 Toxic in contact with skin.

Acute Tox. 1 H330 Fatal if inhaled.



Repr. 1B H360D May damage the unborn child.

**2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008:**

The product 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.

P241 Use explosion-proof [electrical/ventilating/lighting] equipment.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P320 Specific treatment is urgent (see on this label).

P405 Store locked up.

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

**Additional information:**

EUH208 Contains Methyl acrylate, Formaldehyde. May produce an allergic reaction.

Restricted to professional users.

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**\* SECTION 3: Composition/information on ingredients***Substance or mixture: Substance***Information on ingredients:**

CAS: 2343-89-7 Methyl 2-fluoroacrylate	>94%
<i>Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 1, H330</i>	
CAS: 68-12-2 N,N-Dimethylformamide	<1%
<i>Flam. Liq. 3, H226</i>	
<i>Repr. 1B, H360D</i>	
<i>Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2, H319</i>	
CAS: 67-56-1 Methanol	<2%
<i>Flam. Liq. 2, H225</i>	
<i>Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 3, H331</i>	
<i>STOT SE 1, H370</i>	
CAS: 1634-04-4 tert-Butyl methyl ether	<1%
<i>Flam. Liq. 2, H225</i>	
<i>Skin Irrit. 2, H315</i>	
CAS: 127-19-5 N,N-Dimethylacetamide	<1%
<i>Repr. 1B, H360D</i>	
<i>Acute Tox. 4, H312; Acute Tox. 4, H332</i>	
CAS: 96-33-3 Methyl acrylate	<1%
<i>Flam. Liq. 2, H225</i>	
<i>Acute Tox. 4, H302; Acute Tox. 4, H312; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335</i>	
Others	<2%

**SVHC:**

CAS: 68-12-2 N,N-Dimethylformamide

CAS: 127-19-5 N,N-Dimethylacetamide

**SECTION 4: First aid measures****4.1 Description of first aid measures****General information:** Seek medical treatment.**After inhalation:** Supply fresh air; consult doctor in case of complaints.**After skin contact:**

Remove contaminated clothes immediately.

Immediately wash with water and soap and rinse thoroughly.

Consult a doctor in case of complaints.

**After eye contact:**

Immediately rinse with a lot of water for several minutes. Remove contact lenses if possible. Continue rinsing.

Consult an ophthalmologist in case of complaints.

**After swallowing:**

Rinse mouth with water. Do not induce vomiting.

Consult a doctor in case of complaints.

**4.2 Most important symptoms and effects, both acute and chronic:** No further relevant information available.**4.3 Indication of any immediate medical attention and special treatment needed:**

No further relevant information available.

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**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing agents:**

Alcohol resistant foam

Fire-extinguishing powder

Dry sand

CO<sub>2</sub>**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.

Receptacle may explode when heated.

Extremely flammable; can ignite easily with heat, sparks, fire.

**5.3 Advice for firefighters:** Remove receptacles from area of fire if possible.**Protective equipment:**

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:**

Ensure adequate ventilation before entering the area.

Stay on the windward side.

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:** Prevent seepage into sewage system, workpits and cellars.**6.3 Methods and material for containment and cleaning up:**

For a small amount of leakage: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders) or collect in an empty container that can be sealed tightly.

For a small amount of leakage: Use clean anti-static tools when absorbing the product.

For a large amount of leakage: Enclose with banks to avoid outflow. Lead the leakage to a safe place and collect.

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.

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 in a cool and dry location.

Keep containers tightly sealed.

Store under 2-8 °C.

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**Trade name: METHYL 2-FLUOROACRYLATE****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****Additional information about design of technical facilities:** *No further data; see item 7.***8.1 Control parameters** *No further information available.***Ingredients with limit values that require monitoring at the workplace:****CAS: 68-12-2 N,N-Dimethylformamide****IOELV (EU) Short-term value:** 30 mg/m<sup>3</sup>, 10 ppmLong-term value: 15 mg/m<sup>3</sup>, 5 ppm

Skin

**Additional information:** *The lists valid during the making were used as basis.***8.2 Exposure controls****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 filters for organic and acid gas (or airline respirators in some cases) if formation of toxic gases is possible while the product is heated.**Use respiratory protective device with organic gas cartridge.***Protection of hands:**

Protective gloves

**Material of gloves:** Rubber**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 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****Appearance****Form:**

Liquid

**Colour:**

Light yellow to light brown

**Odour:**

Characteristic

**Odour threshold:**

Not determined.

**pH-value:**

No further information available.

**Melting point/freezing point:**

No further information available.

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Trade name: METHYL 2-FLUOROACRYLATE

<b>Initial boiling point and boiling range:</b>	94 °C No further information available.
<b>Flash point:</b>	12 °C (TCC)
<b>Flammability (solid, gas):</b>	Not applicable.
<b>Decomposition temperature:</b>	No further information available.
<b>Auto-ignition temperature:</b>	Not determined.
<b>Explosive properties:</b>	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
<b>Explosion limits:</b>	
<b>Lower explosive limit:</b>	No further information available.
<b>Upper explosive limit:</b>	No further information available.
<b>Vapour pressure:</b>	No further information available.
<b>Density at 20 °C:</b>	1.111 g/cm <sup>3</sup> No further information available.
<b>Relative density</b>	Not determined.
<b>Vapour density</b>	Not determined.
<b>Evaporation rate</b>	Not determined.
<b>Solubility in / Miscibility with water:</b>	No further information available.
<b>Partition coefficient: n-octanol/water:</b>	No further information available.
<b>Viscosity:</b>	Dynamic at 20 °C: 0.61 mPa · s (0.61 cP) Kinematic at 20 °C: 0.0055 cm <sup>2</sup> /s (0.55 cSt)
<b>Dynamic:</b>	Not determined.
<b>Kinematic:</b>	Not determined.
<b>9.2 Other information:</b>	No further relevant information available.

## \* SECTION 10: Stability and reactivity

**10.1 Reactivity** No further relevant information available.

### 10.2 Chemical stability

**Thermal decomposition / conditions to be avoided:**

This substance has flammable property. Stored at 8 °C or less because there is a possibility of polymerization. This substance decomposes on heating or on burning producing toxic fumes including hydrogen fluoride. 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:** Oxidizing agents

**10.6 Hazardous decomposition products:** Danger of toxic fluorine based pyrolysis products.

## \* SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

no data

Toxic if swallowed or in contact with skin.

Fatal if inhaled.

#### LD/LC50 values relevant for classification:

Oral LD50 68 mg/kg (Rat)

Dermal LD50 270 mg/kg (Rat)

Inhalative LC50 500 mg/m<sup>3</sup> (Rat)

Exposure: 2 hours

#### CAS: 2343-89-7 Methyl 2-fluoroacrylate

Oral LD50 68 mg/kg (Rat)

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**Trade name: METHYL 2-FLUOROACRYLATE**

Dermal LD50 270 mg/kg (Rat)  
Inhalative LC50 500 mg/m<sup>3</sup> (Rat)  
Exposure: 2 hours

**CAS: 68-12-2 N,N-Dimethylformamide**

Oral LD50 2800 mg/kg (Rat)  
Dermal LD50 4720 mg/kg (Rabbit)  
Inhalative LC50/4 h 9400 ppm (Mouse)

**Primary irritant effect****Skin corrosion/irritation**

No further information available.

Causes severe burns. Toxic in contact with skin.

**Serious eye damage/irritation**

No further information available.

Causes serious eye damage.

**after inhalation:** No further information available.**Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.**Other information (about experimental toxicology):**

No further information available.

Chromosomal Abberation Study in

**Subacute to chronic toxicity** No further information available.**CMR effects****Germ cell mutagenicity**

Not applicable

**Carcinogenicity** Based on available data, the classification criteria are not met.**Reproductive toxicity**

May damage the unborn child.

**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.**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.**12.4 Mobility in soil:** No further relevant information available.**Ecotoxicological effects:** no data**12.5 Results of PBT and vPvB assessment****PBT:**

No further relevant information available.

Not applicable.

**vPvB:**

No further relevant information available.

Not applicable.

**12.6 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:**  
**ADR, IMDG, IATA**

UN3286

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Trade name: METHYL 2-FLUOROACRYLATE

**14.2 UN proper shipping name:****ADR:****IMDG, IATA**3286 FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.  
FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.**14.3 Transport hazard class(es):****ADR****Class:**

3 Flammable liquids.

**IMDG, IATA****Class:**

3 Flammable liquids.

**14.4 Packing group:****ADR, IMDG, IATA**

II

**14.5 Environmental hazards:****Marine pollutant:**

No

**14.6 Special precautions for user:**

Warning: Flammable liquids.

**EMS Number:**

F-E,S-D

**14.7 Transport in bulk according to Annex II of****MARPOL73/78 and the IBC Code:**

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):**

1L

**Excepted quantities (EQ)**

Code: E2

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 500 ml

**UN "Model Regulation":**UN3286, FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S., 3,  
II**\* 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 product is classified and labelled according to the CLP regulation.

**Hazard pictograms**

GHS02

GHS06

GHS08

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

Methyl 2-fluoroacrylate

N,N-Dimethylformamide

Methanol

methyl fluoroacetate

**Hazard statements**

H225 Highly flammable liquid and vapour.

H301+H311 Toxic if swallowed or in contact with skin.



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H330 Fatal if inhaled.  
H360D May damage the unborn child.

**Precautionary statements**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P241 Use explosion-proof [electrical/ventilating/lighting] equipment.  
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].  
P320 Specific treatment is urgent (see on this label).  
P405 Store locked up.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**National regulations** No further information available.

**Other regulations, limitations and prohibitive regulations: 1**

**Substances of very high concern (SVHC) according to REACH, Article 57:**

CAS: 68-12-2 N,N-Dimethylformamide

**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 européen sur le transport 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

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

SVHC: Substances of Very High Concern

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 2: Flammable liquids – Category 2

Flam. Liq. 3: Flammable liquids – Category 3

Acute Tox. 3: Acute toxicity - oral – Category 3

Acute Tox. 4: Acute toxicity - dermal – Category 4

Acute Tox. 1: Acute toxicity - inhalation – Category 1

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

Repr. 1B: Reproductive toxicity – Category 1B

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