

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

*** SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name: METHYL 2-FLUOROACRYLATE****Article number: MFA STD****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/>sales@daikinchem.de**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. 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. 1A 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**Hazard-determining components of labelling:**

Methyl 2-fluoroacrylate

N,N-Dimethylformamide

Methanol

methyl fluoroacetate

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).

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

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.

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

CAS: 2343-89-7	Methyl 2-fluoroacrylate	>94%
	Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 1, H330	
CAS: 68-12-2	N,N-Dimethylformamide	< 1%
	Flam. Liq. 3, H226	
	Repr. 1B, H360D	
	Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2, H319	
CAS: 67-56-1	Methanol	< 2%
	Flam. Liq. 2, H225	
	Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 3, H331	
	STOT SE 1, H370	
	Specific concentration limits: STOT SE 1; H370: $C \geq 10\%$	
	STOT SE 2; H371: $3\% \leq C < 10\%$	
CAS: 1634-04-4	tert-Butyl methyl ether	< 1%
	Flam. Liq. 2, H225	
	Skin Irrit. 2, H315	
CAS: 127-19-5	N,N-Dimethylacetamide	< 1%
	Repr. 1B, H360D	
	Acute Tox. 4, H312; Acute Tox. 4, H332	
CAS: 96-33-3	Methyl acrylate	< 1%
	Flam. Liq. 2, H225	
	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	
	Others	<2%

SVHC:

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

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

Additional information: For the wording of the listed hazard phrases refer to section 16.**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.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

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.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Alcohol resistant foam

Fire-extinguishing powder

Dry sand

CO₂

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.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE**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.

Prevent any seepage into the ground.

Keep containers tightly sealed.

Store under 2-8 °C.

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** No further information available.**Ingredients with limit values that require monitoring at the workplace:****CAS: 67-56-1 Methanol**IOELV (EU) Long-term value: 260 mg/m³, 200 ppm

Skin

CAS: 1634-04-4 tert-Butyl methyl etherIOELV (EU) Short-term value: 367 mg/m³, 100 ppmLong-term value: 183.5 mg/m³, 50 ppm**CAS: 68-12-2 N,N-Dimethylformamide**BOELV (EU) Short-term value: 30 mg/m³, 10 ppmLong-term value: 15 mg/m³, 5 ppm

Skin

IOELV (EU) Short-term value: 30 mg/m³, 10 ppmLong-term value: 15 mg/m³, 5 ppm

Skin

CAS: 96-33-3 Methyl acrylateIOELV (EU) Short-term value: 36 mg/m³, 10 ppmLong-term value: 18 mg/m³, 5 ppm**CAS: 127-19-5 N,N-Dimethylacetamide**BOELV (EU) Short-term value: 72 mg/m³, 20 ppmLong-term value: 36 mg/m³, 10 ppm

Skin

IOELV (EU) Short-term value: 72 mg/m³, 20 ppmLong-term value: 36 mg/m³, 10 ppm

Skin

CAS: 50-00-0 FormaldehydeBOELV (EU) Short-term value: 0.74 mg/m³, 0.6 ppmLong-term value: 0.37 (0.62)* mg/m³, 0.3 (0.5)* ppm

Skin sens; *health/funeral/embalming till 11/7/24

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.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

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.

Hand protection

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/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**

Fluid

Colour:

Light yellow to light brown

Odour:

Characteristic

Odour threshold:

Not determined.

Melting point/freezing point:

Undetermined.

Boiling point or initial boiling point and boiling range 42 °C**Flammability**

Highly flammable.

Lower and upper explosion limit**Lower explosive limit:**

No further information available.

Upper explosive limit:

Not determined.

Flash point:

12 °C (TCC)

Decomposition temperature:

No further information available.

pH

Not determined.

Viscosity:

Dynamic at 20 °C: 0.61 mPa · s (0.61 cP)

Kinematic at 20 °C: 0.0055 cm²/s (0.55 cSt)**Kinematic viscosity**

Not determined.

Dynamic:

Not determined.

Solubility**water:**

No further information available.

Partition coefficient n-octanol/water (log value)

No further information available.

Vapour pressure:

No further information available.

Density and/or relative density**Density at 20 °C:**1.111 g/cm³**Relative density**

Not determined.

Vapour density

Not determined.

Particle characteristics

Not applicable.

9.2 Other information:**Form:**

Liquid

Auto-ignition temperature:

Product is not self-igniting.

Explosive properties:

Product is not explosive. However, formation of explosive air/vapour mixtures are possible.

Evaporation rate

Not determined.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

Information with regard to physical hazard classes

Explosives	Not applicable
Flammable gases	Not applicable
Aerosols	Not applicable
Oxidising gases	Not applicable
Gases under pressure	Not applicable
Flammable liquids	Highly flammable liquid and vapour.
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.

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 hazard classes as defined in Regulation (EC) No 1272/2008****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/m³ (Rat)

Exposure: 2 hours

CAS: 2343-89-7 Methyl 2-fluoroacrylate

Oral LD50 68 mg/kg (Rat)

Dermal LD50 270 mg/kg (Rat)

Inhalative LC50 500 mg/m³ (Rat)

Exposure: 2 hours

Skin corrosion/irritation

No further information available.

Causes severe burns. Toxic in contact with skin.

Serious eye damage/irritation

No further information available.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

Causes serious eye damage.

after inhalation: No further information available.

Respiratory or skin sensitisation No further information available.

Reproductive toxicity May damage the unborn child.

STOT-repeated exposure No further information available.

Other information (about experimental toxicology):

No further information available.

Chromosomal Abberation Study in

Subacute to chronic toxicity No further information available.

11.2 Information on other hazards

Endocrine disrupting properties

CAS: 128-37-0 Butylated hydroxytoluene: List II

* 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.

12.5 Results of PBT and vPvB assessment

PBT:

No further relevant information available.

No further relevant information available.

Not applicable.

vPvB:

No further relevant information available.

Not applicable.

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

12.7 Other adverse effects:

Ecotoxicological effects: no data

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

UN3286

14.2 UN proper shipping name:

ADR, IMDG, IATA

FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S. (Methyl 2-fluoroacrylate)

14.3 Transport hazard class(es):

ADR



Class:

3 (FTC) Flammable liquids.

Safety data sheet

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

Label: 3+6.1+8
IMDG



Class: 3 Flammable liquids.
Label: 3/6.1/8
IATA



Class: 3 Flammable liquids.
Label: 3 (6.1, 8)
14.4 Packing group: II
ADR, IMDG, IATA
14.5 Environmental hazards:
Marine pollutant: No
14.6 Special precautions for user: Warning: Flammable liquids.
Hazard identification number (Kemler code): 368
EMS Number: F-E,S-C
Stowage Category: B
Stowage Code: SW2 Clear of living quarters.
Segregation Code: SG5 Segregation as for class 3
SG8 Stow "away from" class 4.1

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.

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

Transport category: 2
Tunnel restriction code: D/E

IMDG

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": UN 3286 FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S. (METHYL 2-FLUOROACRYLATE), 3 (6.1+8), II

* SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
No further relevant information available.

Dutch List of Substances of Very High Concern (ZZS)

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

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

CAS: 50-00-0 Formaldehyde

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE**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.

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.

Seveso category

H1 ACUTE TOXIC

P5c FLAMMABLE LIQUIDS

DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II*None of the ingredients is listed.***Annex I - RESTRICTED EXPLOSIVES PRECURSORS (Upper limit value for the purpose of licensing under Article 5(3))***None of the ingredients is listed.***Annex II - REPORTABLE EXPLOSIVES PRECURSORS***None of the ingredients is listed.***Regulation (EC) No 273/2004 on drug precursors***None of the ingredients is listed.***Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors***None of the ingredients is listed.***National regulations** No further information available.**Other regulations, limitations and prohibitive regulations:****Substances of very high concern (SVHC) according to REACH, Article 57:**

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

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

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

Printing date 08.03.2023

Version number 1

Revision: 08.03.2023

Trade name: METHYL 2-FLUOROACRYLATE

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

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. 2: Acute toxicity – Category 2

Acute Tox. 3: Acute toxicity – Category 3

Acute Tox. 4: Acute toxicity – Category 4

Acute Tox. 1: Acute toxicity – Category 1

Skin Corr. 1B: Skin corrosion/irritation – Category 1B

Skin Irrit. 2: Skin corrosion/irritation – Category 2

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

Skin Sens. 1: Skin sensitisation – Category 1

Muta. 2: Germ cell mutagenicity – Category 2

Carc. 1B: Carcinogenicity – Category 1B

Repr. 1A: Reproductive toxicity – Category 1A

Repr. 1B: Reproductive toxicity – Category 1B

STOT SE 1: Specific target organ toxicity (single exposure) – Category 1

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

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