



A MITSUBISHI CHEMICAL GROUP company

**BIMAX® TFEMA****Safety Data Sheet 9048B**

Issue date: 01/04/2023

Revision date: 12/09/2024

Version: 2.0

**SECTION 1: Identification****1.1. Identification**

Product name	: BIMAX® TFEMA
Product code	: 9048B
Product form	: Substance
Physical state	: Liquid
Formula	: C <sub>6</sub> H <sub>7</sub> F <sub>3</sub> O <sub>2</sub>
Synonyms	: 2,2,2-trifluoroethyl methacrylate
Chemical name	: 2,2,2-Trifluoroethyl 2-methyl-2-propenoate

**1.2. Recommended use and restrictions on use**

Recommended use	: Laboratory chemicals Manufacture of substances
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**1.3. Supplier****GELEST, INC.**158 Industrial Road  
Glen Rock, PA 17327**USA**

T 717-227-1774 - F 717-227-1775 - (M-F): 8:00 AM - 5:30 PM EST

[info@gelest.com](mailto:info@gelest.com) - [www.gelest.com](http://www.gelest.com)**1.4. Emergency telephone number**

Emergency number	: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)
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**SECTION 2: Hazard(s) identification****2.1. Classification of the substance or mixture****GHS US classification**

Flammable liquids Category 2	H225	Highly flammable liquid and vapor
Skin corrosion/irritation Category 2	H315	Causes skin irritation
Serious eye damage/eye irritation Category 2	H319	Causes serious eye irritation
Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335	May cause respiratory irritation
Full text of H statements : see section 16		

**2.2. GHS Label elements, including precautionary statements****GHS US labeling**

Hazard pictograms (GHS US)



Signal word (GHS US)

: Danger

Hazard statements (GHS US)

: H225 - Highly flammable liquid and vapor  
 H315 - Causes skin irritation  
 H319 - Causes serious eye irritation  
 H335 - May cause respiratory irritation

Precautionary statements (GHS US)

: P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
 P233 - Keep container tightly closed.

# BIMAX® TFEMA

## Safety Data Sheet

P240 - Ground/Bond container and receiving equipment.  
P241 - Use explosion-proof electrical/ventilating/lighting equipment.  
P242 - Use only non-sparking tools.  
P243 - Take precautionary measures against static discharge.  
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.  
P264 - Wash skin thoroughly after handling.  
P271 - Use only outdoors or in a well-ventilated area.  
P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower  
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.  
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P312 - Call a poison center or doctor if you feel unwell.  
P321 - Specific treatment (see supplemental first aid instruction on this label).  
P332+P313 - If skin irritation occurs: Get medical advice/attention.  
P337+P313 - If eye irritation persists: Get medical advice/attention.  
P362+P364 - Take off contaminated clothing and wash it before reuse.  
P370+P378 - In case of fire: Use dry sand, dry powder, alcohol resistant foam to extinguish.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P403+P235 - Keep in a cool place  
P405 - Store locked up.  
P501 - Dispose of contents/container to an approved waste disposal plant.

### 2.3. Hazards not otherwise classified (HNOC)

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Substance type : Mono-constituent  
Name : BIMAX® TFEMA  
CAS-No. : 352-87-4

Name	Product identifier	%	GHS US classification
2,2,2-trifluoroethyl methacrylate	CAS-No.: 352-87-4	≥ 99.5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335

Full text of hazard classes and H-statements : see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures general : Call a poison center/doctor/physician if you feel unwell.  
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor/physician if you feel unwell.  
First-aid measures after skin contact : Rinse skin with water/shower. Remove/take off immediately all contaminated clothing. If skin irritation occurs: Get medical advice/attention.

# BIMAX® TFEMA

## Safety Data Sheet

First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: Call a poison center/doctor/physician if you feel unwell. Rinse mouth.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation	: May cause respiratory irritation.
Symptoms/effects after skin contact	: Irritation.
Symptoms/effects after eye contact	: Eye irritation.

### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	: Avoid the use of streaming water, as this may spread the fire.

### 5.2. Specific hazards arising from the chemical

Fire hazard	: Highly flammable liquid and vapor.
Reactivity	: No dangerous reactions known under normal conditions of use. Highly flammable liquid and vapor.

### 5.3. Special protective equipment and precautions for fire-fighters

Precautionary measures fire	: Eliminate all ignition sources if safe to do so.
Firefighting instructions	: Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.
Protection during firefighting	: Wear recommended personal protective equipment. Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment	: Wear recommended personal protective equipment.
Emergency procedures	: Ventilate spillage area. No open flames, no sparks, and no smoking. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes.

#### 6.1.2. For emergency responders

Protective equipment	: Do not attempt to take action without suitable protective equipment. Use personal protective equipment as required. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	: Evacuate unnecessary personnel. Stop leak if safe to do so.

### 6.2. Environmental precautions

Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

For containment	: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak, if possible without risk.
Methods for cleaning up	: Take up liquid spill into absorbent material.
Other information	: Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling	: Ensure good ventilation of the work station. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes.
Hygiene measures	: Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures	: Ground/bond container and receiving equipment.
Storage conditions	: Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Incompatible materials	: Oxidizers. Free radical initiators.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

No additional information available

### 8.2. Appropriate engineering controls

Appropriate engineering controls	: Ensure adequate ventilation.
Environmental exposure controls	: Avoid release to the environment.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

Wear recommended personal protective equipment.

#### Eye protection:

Chemical goggles or safety glasses

#### Skin and body protection:

Wear suitable protective clothing

#### Respiratory protection:

In case of inadequate ventilation wear respiratory protection.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear, colorless Liquid.
Molecular mass	: 168.11 g/mol Source: Uakron
Color	: No data available
Odor	: No data available
Odor threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: 108 °C Atm. press.: 1013 hPa
Flash point	: 19.5 °C Atm. press.: 1013 hPa

# BIMAX® TFEMA

## Safety Data Sheet

Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Highly flammable liquid and vapor.
Vapor pressure	: 2200 Pa at 20 °C Source: ECHA
Relative vapor density at 20°C	: 5.8 Source: Uakron
Relative density	: 1.1769 Source: ECHA
Solubility	: Water: 906 mg/l
Partition coefficient n-octanol/water (Log Pow)	: No data available
Partition coefficient n-octanol/water (Log Kow)	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No dangerous reactions known under normal conditions of use. Highly flammable liquid and vapor.

### 10.2. Chemical stability

Stable under normal temperatures and pressures.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization is not expected to occur under normal temperatures and pressures.

### 10.4. Conditions to avoid

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

### 10.5. Incompatible materials

Oxidizers. Free radical initiators.

### 10.6. Hazardous decomposition products

In the event of fire: see section 5.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

#### BIMAX® TFEMA (352-87-4)

ATE US (oral)	200 mg/kg body weight
ATE US (vapors)	2.77 mg/l/4h

#### 2,2,2-trifluoroethyl methacrylate (352-87-4)

LD50 oral rat	200 – 2000 mg/kg Source: ECHA
LD50 dermal rat	> 2000 mg/kg body weight Animal: rat, Guideline: EU Method B.3 (Acute Toxicity (Dermal)), Guideline: OECD Guideline 402 (Acute Dermal Toxicity)

# BIMAX® TFEMA

## Safety Data Sheet

Skin corrosion/irritation	: Causes skin irritation.
Serious eye damage/irritation	: Causes serious eye irritation.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: May cause respiratory irritation.
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: May cause respiratory irritation.
Symptoms/effects after skin contact	: Irritation.
Symptoms/effects after eye contact	: Eye irritation.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.
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#### 2,2,2-trifluoroethyl methacrylate (352-87-4)

LC50 - Fish [1]	16.554 mg/l Source: Ecological Structure Activity Relationships
EC50 - Crustacea [1]	19 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	39.5 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)
EC50 72h - Algae [2]	29.9 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

#### 2,2,2-trifluoroethyl methacrylate (352-87-4)

Partition coefficient n-octanol/water (Log Pow)	2.32 Source: ECHA
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### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Disposal methods





Regional waste regulation	: Disposal must be done according to official regulations.
Sewage disposal recommendations	: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations.
Additional information	: Flammable vapors may accumulate in the container. Do not re-use empty containers.

## SECTION 14: Transport information

In accordance with DOT / TDG / IMDG / IATA

# BIMAX® TFEMA

## Safety Data Sheet

DOT	TDG	IMDG	IATA
<b>14.1. UN number</b>			
UN3272	UN3272	3272	3272
<b>14.2. Proper Shipping Name</b>			
Esters, n.o.s. (2,2,2-TRIFLUOROETHYL METHACRYLATE)	ESTERS, N.O.S. (2,2,2-TRIFLUOROETHYL METHACRYLATE)	ESTERS, N.O.S. (2,2,2-TRIFLUOROETHYL METHACRYLATE)	Esters, n.o.s. (2,2,2-Trifluoroethyl methacrylate)
<b>Transport document description</b>			
UN3272 Esters, n.o.s. (2,2,2-TRIFLUOROETHYL METHACRYLATE), 3, II	UN3272 ESTERS, N.O.S. (2,2,2-TRIFLUOROETHYL METHACRYLATE), 3, II	UN 3272 ESTERS, N.O.S. (2,2,2-TRIFLUOROETHYL METHACRYLATE), 3, II	UN 3272 Esters, n.o.s. (2,2,2-Trifluoroethyl methacrylate), 3, II
<b>14.3. Transport hazard class(es)</b>			
3	3	3	3
			
<b>14.4. Packing group</b>			
II	II	II	II
<b>14.5. Environmental hazards</b>			
Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No
No supplementary information available			

### 14.6. Special precautions for user

#### DOT

UN-No.(DOT)

DOT Special Provisions (49 CFR 172.102)

: UN3272

: IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.

T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)

TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling =  $97 / 1 + a (tr - tf)$  Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

TP8 - A portable tank having a minimum test pressure of 1.5 bar (150 kPa) may be used when the flash point of the hazardous material transported is greater than 0 C (32 F).

TP28 - A portable tank having a minimum test pressure of 2.65 bar (265 kPa) may be used provided the calculated test pressure is 2.65 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

DOT Packaging Exceptions (49 CFR 173.xxx) : 150

DOT Packaging Non Bulk (49 CFR 173.xxx) : 202

DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L

# BIMAX® TFEMA

## Safety Data Sheet

DOT Vessel Stowage Location : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

### TDG

UN-No. (TDG)

: UN3272

TDG Special Provisions

: 16 - 1) The technical name of the most dangerous substance related to the primary class must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(i)(A) of Part 3, Documentation. The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4, Dangerous Goods Safety Marks. 2) subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical: a) UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S; b) UN1851, MEDICINE, LIQUID, TOXIC, N.O.S; c) UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, N.O.S; d) UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or e) UN3249, MEDICINE, SOLID, TOXIC, N.O.S. An example in Canada is the "Food and Drugs Act".

Explosive Limit and Limited Quantity Index

: 1 L

Excepted quantities (TDG)

: E2

Passenger Carrying Road Vehicle or Passenger

: 5 L

Carrying Railway Vehicle Index

Emergency Response Guide (ERG) Number

: 127

### IMDG

Special provision (IMDG)

: 274

Limited quantities (IMDG)

: 1 L

Excepted quantities (IMDG)

: E2

Packing instructions (IMDG)

: P001

IBC packing instructions (IMDG)

: IBC02

Tank instructions (IMDG)

: T7

Tank special provisions (IMDG)

: TP1, TP8, TP28

EmS-No. (Fire)

: F-E - FIRE SCHEDULE Echo - NON-WATER-REACTIVE FLAMMABLE LIQUIDS

EmS-No. (Spillage)

: S-D - SPILLAGE SCHEDULE Delta - FLAMMABLE LIQUIDS

Stowage category (IMDG)

: B

### IATA

PCA Excepted quantities (IATA)

: E2

PCA Limited quantities (IATA)

: Y341

PCA limited quantity max net quantity (IATA)

: 1L

PCA packing instructions (IATA)

: 353

PCA max net quantity (IATA)

: 5L

CAO packing instructions (IATA)

: 364

CAO max net quantity (IATA)

: 60L

Special provision (IATA)

: A3

ERG code (IATA)

: 3L

## 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

Commercial status of components according to the United States Environmental Protection Agency's Toxic Substances Control Act (TSCA):



BIMAX® TFEMA

Safety Data Sheet

Name	CAS-No.	Listing	Commercial status	Flags
2,2,2-trifluoroethyl methacrylate	352-87-4	Present	Active	

15.2. International regulations

CANADA

2,2,2-trifluoroethyl methacrylate (352-87-4)
Listed on the Canadian NDSL (Non-Domestic Substances List)

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Full text of H-phrases::	
H225	Highly flammable liquid and vapor
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

Abbreviations and acronyms : Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor. European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways. European Agreement concerning the International Carriage of Dangerous Goods by Road. Acute Toxicity Estimate. Bioconcentration factor. Biological limit value. Biochemical oxygen demand (BOD). Chemical oxygen demand (COD). Derived Minimal Effect level. Derived-No Effect Level. European Community number. Median effective concentration. European Standard. International Agency for Research on Cancer. International Air Transport Association. International Maritime Dangerous Goods. Median lethal concentration. Median lethal dose. Lowest Observed Adverse Effect Level. No-Observed Adverse Effect Concentration. No-Observed Adverse Effect Level. No-Observed Effect Concentration. Organisation for Economic Co-operation and Development. Occupational Exposure Limit. Persistent Bioaccumulative Toxic. Predicted No-Effect Concentration. Regulations concerning the International Carriage of Dangerous Goods by Rail. Safety Data Sheet. Sewage treatment plant. Theoretical oxygen demand (ThOD). Median Tolerance Limit. Volatile Organic Compounds. Chemical Abstract Service number. Not Otherwise Specified. Very Persistent and Very Bioaccumulative. Endocrine disruptor.

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

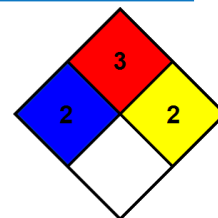
NFPA fire hazard : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions.

# BIMAX® TFEMA

## Safety Data Sheet

NFPA reactivity

: 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.



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SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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