

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



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

1.1. Product identifier

Trade name

2,2,2-Trifluoroethanol

CAS number

75-89-8

EC number

200-913-6

Synonyms

TFEA

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses

Research and development. Laboratory Chemicals. Manufacture of substances.

Not suitable for use in

Not suitable for human consumption or veterinary purposes.

1.3. Details of the supplier of the safety data sheet

Supplier

Molekula Group

Address

Molekula Ltd, Lingfield Way, Darlington,
DL1 4XX Darlington
United Kingdom

Telephone

+44 (0) 3302 000 333

Email

info@molekula.com

Web site

www.molekula.com

Contact person

Kevin Banks

Email

+44 (0) 7769276927

1.4. Emergency telephone number

Poison center/Additional emergency number

0344 892 0111 - National Poisons Information Service (Newcastle Centre)

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Classification

Serious eye damage, hazard category 1
Reproductive toxicity, hazard category 1A
Specific Target Organ Toxicity — Repeated exposure, hazard category 2
Acute toxicity, oral, hazard category 3
Acute toxicity, dermal, hazard category 3
Acute toxicity, inhalation, hazard category 2

Hazard statements

H226, H301 + H311 + H331, H318, H360F, H373

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard pictograms



Signal word

Danger

Hazard statements

H226 Flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H318 Causes serious eye damage.
H360F May damage fertility.
H373 May cause damage to organs through prolonged or repeated exposure.

Supplemental hazard statements

EUH031 Contact with acids liberates toxic gas.

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Precautionary statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P231 Handle and store contents under inert gas?.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathe dust/fumes/gas/mist/vapours/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 wear respiratory protection.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352 IF ON SKIN: Wash with plenty of water/.
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.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P314 Get medical advice/attention if you feel unwell.
P330 Rinse mouth.
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/container to local regulations.

2.3. Other hazards

No data available

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical name	CAS No. EC No. REACH No. Index No.	Concentration	Classification	H-phrases M factor acute M factor chronic	Note
2,2,2-Trifluoroethanol	75-89-8 200-913-6 - -	100%	Flam. Liq. 3, Acute Tox. 3 - oral, Acute Tox. 3 - dermal, Acute Tox. 3 - inhala- tion, Eye Dam. 1, Repr. 1A, STOT RE 2	H226, H301 + H311 + H331, H318, H360F, H373 - -	-

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Molecular weight

100.04

Substance additional information

For the complete text of H- / EUH-statements mentioned in this section, see section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

IF exposed or concerned: Get medical advice/attention. First aiders/ medical personnel need to protect themselves. Show this Safety Data Sheet (SDS) to medical personnel.

Inhalation

Toxic if inhaled. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. If breathing stops, provide artificial respiration. For breathing difficulties oxygen may be necessary.

Skin contact

In case of skin contact: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Immediately call a POISON CENTER/doctor. The casualty should be transferred to hospital for further treatment.

Eye contact

Remove contact lenses if present. Rinse eyes with water. Continue to rinse for at least 15 minutes and seek medical attention.

Ingestion

IF SWALLOWED: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only if the persons are fully conscious and awake). Administer activated charcoal (20 - 40g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

Information for doctors

No data available.

4.2. Most important symptoms and effects, both acute and delayed

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. See section 11 for more detailed information on health effects and symptoms.

Inhalation

Single exposure may cause the following adverse effects: Difficulty in breathing. Unconsciousness, possibly death. Give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Skin contact

Single exposure may cause the following adverse effects: Unconsciousness, possibly death.

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Eye contact

Single exposure may cause the following adverse effects: Severe irritation. Unconsciousness, possibly death.

Ingestion

Single exposure may cause the following adverse effects: Severe abdominal pain. May cause severe internal injury. Unconsciousness, possibly death. Do NOT induce vomiting.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. No special treatment requirement.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

Unsuitable extinguishing media

No specific fire fighting procedure given.

5.2. Special hazards arising from the substance or mixture

Specific hazards: Toxic. Corrosive. FLAMMABLE.

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

Development of hazardous combustion gases or vapours possible in the event of fire.

Carbon monoxide (CO). Carbon dioxide (CO₂).

Hydrogen fluoride (HF).

Combustible.

Vapours are heavier than air and may spread near ground to sources of ignition.

Explosive mixtures may be formed at elevated temperatures

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Evacuate area. Avoid breathing gas, fume, vapours or spray. Cool containers exposed to heat with water spray and remove container, if no risk is involved.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid breathing dust/fume/gas/mist/vapours/spray. Provide adequate ventilation. Avoid contact with skin and eyes. Avoid dust formation. For personal protection, see section 8.

6.2. Environmental precautions

Avoid discharge into drains, water courses or onto the ground. Risk of explosion.

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



6.3. Methods and material for containment and cleaning up

Collect with absorbent, non-combustible material into suitable containers. Collect spillage with shovel, broom or the like and reuse, if possible. Dispose of large amounts of spillage/waste according to agreement with local authorities.

6.4. Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Preventive handling precautions

For precautions see section 2.2. Work under hood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. This product is toxic. Keep containers tightly closed. Immediate first aid is necessary. Wear protective clothing, gloves, eye and face protection. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid ingestion and inhalation. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Do not reuse empty containers.

General hygiene

Observe good chemical hygiene practices. Remove contaminated clothing immediately and wash skin with soap and water. Remove contaminated clothing and launder thoroughly before re-use. Wash skin thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Store at room temperature. Store in a dry place. Store in a closed container.

Storage class : Toxic storage.

7.3. Specific end use(s)

No specific usage precautions noted.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DNEL/DMEL

Product/Substance name (CAS No./EC No.)	Type	Exposure	Value	Population	Effects
2,2,2-Trifluoroethanol (75-89-8/200-913-6)	DNEL	Chronic (long term) Inhalation	0.1 mg/m ³	Workers	Local

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



8.2. Exposure controls

Personal Protective Equipment Symbols



Eye / face protection

Wear eye protection.

Hand protection

Wear protective gloves. Recommended gloves: Chloroprene rubber.

Glove Thickness: 0.65mm

Breakthrough time: 8 hours

Always inspect gloves before use. If signs of wear and tear are noticed then the gloves should be replaced.

No specific hygiene procedures noted, but good personal hygiene practices are always advisable, especially when working with chemicals.

Wash contaminated skin thoroughly after handling.

Other skin protection

Wash skin thoroughly after handling.

Respiratory protection

Provide adequate ventilation. If ventilation is insufficient, suitable respiratory protection must be provided.

Environmental exposure controls

Avoid discharge into drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state

Liquid

Colour

Colourless.

Odour

Characteristic.

Melting point / freezing point

-44 °C

Boiling point or initial boiling point and boiling range

77 - 80 °C

Flammability

FLAMMABLE LIQUIDS

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Lower and upper explosion limit

8.4 - 28.8 %

Flash point

29 °C

Auto-ignition temperature

No data available

Decomposition temperature

315 °C

pH

5 - 7.5

Kinematic viscosity

No data available

Solubility

No data available

Partition coefficient n-octanol/water

log Pow: < 0.3 at 25 °C

Method

Bioaccumulation: Is not expected to be bioaccumulable.

Vapour pressure

70.9 hPa at 20 °C

Density and/or relative density

1.373

Relative vapour density

No data available

Particle characteristics

No data available

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Vapor/air-mixtures are explosive at intense warming.

10.2. Chemical stability

Stable under normal temperature conditions. Stable under the prescribed storage conditions.

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



10.3. Possibility of hazardous reactions

Violent reactions possible with:
Strong oxidising agents.
Strong alkalis.

10.4. Conditions to avoid

Heating.

10.5. Incompatible materials

Bases. Metals. Potassium. Strong oxidising agents. Strong acids. Sodium. sodium oxides

10.6. Hazardous decomposition products

See section 5.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product / Substance name CAS / EC no.	Dose descriptor	Value / Dose	Exposure route	Test animals
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	ATE = Acute Toxicity Estimate.	153 mg/kg	Oral	-
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	ATE = Acute Toxicity Estimate.	3.207827 mg/l (vapours)	Inhalation.	-
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	LD50	>2000 mg/kg	Dermal	Rat

Skin corrosion/irritation

Product / Substance name CAS / EC no.	Result	Duration of exposure	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	No skin irritation.	4 hours	Rabbit

Serious eye damage/irritation

Product / Substance name CAS / EC no.	Result	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Irreversible effects on the eye	Rabbit

Respiratory or skin sensitisation

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Product / Substance name CAS / EC no.	Result	Species	Method / Guideline
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Negative.	Mouse	Local Lymph Node Assay

Germ cell mutagenicity

Product / Substance name CAS / EC no.	Result	Metabolic activation / Exposure	Species	Method / Guideline
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Negative.	with and without meta- bolic activation	Salmonella typhimurium	Ames test
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Negative.	with and without meta- bolic activation	Chinese hamster lung cells	Mutagenicity (mammal cell test): Chromosome aberration:
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Negative.	with and without meta- bolic activation	Mouse lymphoma test	In vitro mammalian cell gene mutation test.

Reproductive toxicity

Product / Substance name CAS / EC no.	Result
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	May damage fertility.

STOT-repeated exposure

Product / Substance name CAS / EC no.	Exposure route	Target organs	Result
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	Inhalation.	Blood.	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

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

11.2. Information on other hazards

No data available

According to Regulation (EC) No 1907/2006
According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



SECTION 12: Ecological information

12.1. Toxicity

Acute fish toxicity

Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	LC50	119 mg/l	96 hours	Pimephales promelas (Fat-head Minnow)

Acute algae toxicity

Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	ErC50	>974 mg/l	72 hours	Pseudokirchneriella sub- capitata

Acute crustacean toxicity

Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	EC50	>1000 mg/l	48 hours	Daphnia magna

Micro-/macro organism toxicity

Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
2,2,2-Trifluoroethanol 75-89-8 / 200-913-6	EC50	>1000 mg/l	3 hours	Activated sludge.

12.2. Persistence and degradability

Persistence and degradability

Product / Substance name CAS / EC no.	Type of test	Duration	Result	Degradation
2,2,2-Trifluoroethanol	aerobic	28 days	0%	The product is not read-

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



Product / Substance name CAS / EC no.	Type of test	Duration	Result	Degradation
75-89-8 / 200-913-6				ily biodegradable.

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Endocrine disrupting properties

This product does not contain any known or suspected endocrine disruptors.

12.7. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal considerations

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

SECTION 14: Transport information

14.1. UN number

1986

14.2. UN proper shipping name

ADR / RID / ADN proper shipping name

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethanol)

IMDG proper shipping name

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethanol)

IATA proper shipping name

Alcohols, flammable, toxic, n.o.s. (2,2,2-Trifluoroethanol)

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1

Issued: 2024-03-11



14.3. Transport hazard class(es)

Label

ADR/RID/ADN



3



6.1

IMDG



3



6.1

IATA



3



6.1

ADR / RID Class

3

ADR / RID Classification code

FT1

ADR / RID hazard identification number

36

IMDG Class

3 (6.1)

IATA Class

3 (6.1)

ADN Class

3

ADN Class Code

FT1

14.4. Packing group

ADR / RID / ADN: III

IMDG: III

IATA: III

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

2,2,2-Trifluoroethanol

Version number: 1
Issued: 2024-03-11



14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Special precautions for user

Tunnel restriction code: D/E

Transport category: 3

IMDG EmS

F-E, S-D

14.7. Maritime transport in bulk according to IMO instruments

IBC Instruction: IBC03

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

This material safety data sheet complies with the requirements of Regulation (EU) 2020/878.

National regulations

Directive: 2012/18/EU:

H2 ACUTE TOXIC

P5c FLAMMABLE LIQUIDS

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Phrase meaning

Eye Dam. 1 - Serious eye damage, hazard category 1

Repr. 1A - Reproductive toxicity, hazard category 1A

STOT RE 2 - Specific Target Organ Toxicity — Repeated exposure, hazard category 2

Acute Tox. 3 - oral - Acute toxicity, oral, hazard category 3

Acute Tox. 3 - dermal - Acute toxicity, dermal, hazard category 3

Acute Tox. 2 - inhalation - Acute toxicity, inhalation, hazard category 2

Flam. Liq. 3 - Flammable liquids, hazard category 3

Acute Tox. 3 - inhalation - Acute toxicity, inhalation, hazard category 3

H226 Flammable liquid and vapour.

H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.

H318 Causes serious eye damage.

H360F May damage fertility.

H373 May cause damage to organs through prolonged or repeated exposure.

EUH031 Contact with acids liberates toxic gas.