

# Safety data sheet

according to 1907/2006/EC, Article 31

Revision: 26.05.2011

Printing date 02.07.2013

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name

**2,2,2-Trifluoroethyl vinyl ether**

Stock number:

L20218

CAS Number:

406-90-6

EC number:

206-977-1

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

Identified use:

SU24 Scientific research and development

**1.3 Details of the supplier of the safety data sheet**

Manufacturer/Supplier:

Alfa Aesar GmbH & Co.KG  
A Johnson Matthey Company  
Zeppelinstr. 7b  
76185 Karlsruhe / Germany  
Tel: +49 (0) 721 84007 280  
Fax: +49 (0) 721 84007 300  
Email: tech@alfa.com  
www.alfa.com

Informing department:

Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:

Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)

Poison Information Center Mainz

www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008



GHS02 flame

Flam. Liq. 2 H225 Highly flammable liquid and vapour.



GHS08 health hazard

Muta. 2 H341 Suspected of causing genetic defects.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Xn; Harmful

R68: Possible risk of irreversible effects.



F+; Highly flammable

R11: Highly flammable.

**Information concerning particular hazards for human and environment:**

Not applicable

**Other hazards that do not result in classification**

No information known.

**2.2 Label elements**

Labelling according to Regulation (EC) No 1272/2008

Hazard pictograms

Signal word

Hazard statements

Precautionary statements

The substance is classified and labelled according to the CLP regulation.

GHS02, GHS08

Danger

H225 Highly flammable liquid and vapour.

H341 Suspected of causing genetic defects.

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

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

P280 Wear protective gloves/protective clothing/eye protection/face protection.

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

P405 Store locked up.

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

**2.3 Other hazards**

Results of PBT and vPvB assessment

PBT:

Not applicable.

vPvB:

Not applicable.

**SECTION 3: Composition/information on ingredients****3.1 Substances**

CAS# Designation:

406-90-6 2,2,2-Trifluoroethyl vinyl ether

Identification number(s):

206-977-1

EC number:

**SECTION 4: First aid measures****4.1 Description of first aid measures**

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.

After skin contact

Seek immediate medical advice.

Instantly wash with water and soap and rinse thoroughly.

After eye contact

Seek immediate medical advice.

After swallowing

Rinse opened eye for several minutes under running water. Then consult doctor.

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

Seek medical treatment.

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

No further relevant information available.

No further relevant information available.

**SECTION 5: Firefighting measures****5.1 Extinguishing media**

Suitable extinguishing agents

CO2, sand, extinguishing powder. Do not use water.

**5.2 Special hazards arising from the substance or mixture**

Danger of containers bursting upon heating.

If this product is involved in a fire, the following can be released:

Carbon monoxide and carbon dioxide

Hydrogen fluoride (HF)

**5.3 Advice for firefighters**

Protective equipment:

Wear self-contained breathing apparatus.

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Wear full protective suit.

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**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation**6.2 Environmental precautions:**Keep away from ignition sources  
Do not allow material to be released to the environment without proper governmental permits.  
Do not allow product to reach sewage system or water bodies.  
Do not allow to enter the ground/soil.**6.3 Methods and material for containment and cleaning up:**Keep away from ignition sources.  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Dispose of contaminated material as waste according to item 13.  
Ensure adequate ventilation.**Prevention of secondary hazards:****6.4 Reference to other sections**Keep away from ignition sources.  
See Section 7 for information on safe handling  
See section 8 for information on personal protection equipment.  
See Section 13 for information on disposal.**SECTION 7: Handling and storage****7.1 Precautions for safe handling**Keep containers tightly sealed.  
Ensure good ventilation/exhaustion at the workplace.**Information about protection against explosions and fires:**Protect against electrostatic charges.  
Fumes can combine with air to form an explosive mixture.**7.2 Conditions for safe storage, including any incompatibilities****Storage Requirements to be met by storerooms and containers:**

Refrigerate

**Information about storage in one common storage facility:**Store in the dark.  
Protect from heat.**Further information about storage conditions:**Keep container tightly sealed.  
Protect from the effects of light.  
Refrigerate**7.3 Specific end use(s)**

No further relevant information available.

**SECTION 8: Exposure controls/personal protection****Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**8.1 Control parameters****Components with critical values that require monitoring at the workplace:****406-90-6 2,2,2-Trifluoroethyl vinyl ether (100,0%)**

MAK (TRGS 900) (Germany)

10 mg/m<sup>3</sup>

REL (USA)

DK

Short-term value: C 10,3\* mg/m<sup>3</sup>, C 2\* ppm  
\*60-min; for exposure to waste anesthetic gases**Additional information:**

No data

**8.2 Exposure controls****Personal protective equipment****General protective and hygienic measures**The usual precautionary measures should be adhered to in handling the chemicals.  
Keep away from foodstuffs, beverages and food.  
Instantly remove any soiled and impregnated garments.  
Wash hands during breaks and at the end of the work.**Breathing equipment:****Protection of hands:**Maintain an ergonomically appropriate working environment.  
Use breathing protection with high concentrations.  
Check protective gloves prior to each use for their proper condition.  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.**Material of gloves****Penetration time of glove material****Eye protection:**

Impervious gloves

Not determined

Safety glasses

Face protection

**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:**

Colourless

**Smell:**

Ether-like

**Odour threshold:**

Not determined.

**pH-value:**

Not determined.

**Change in condition****Melting point/Melting range:**

Not determined

**Boiling point/Boiling range:**

42-43 °C

**Sublimation temperature / start:**

Not determined

**Flash point:**

-30 °C

**Inflammability (solid, gaseous)**

Not applicable.

**Ignition temperature:**

Not determined

**Decomposition temperature:**

Not determined

**Self-inflammability:**

Not determined.

**Critical values for explosion:****Lower:**

Not determined

**Upper:**

Not determined

**Steam pressure:**

Not determined

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Density at 20 °C	1,135 g/cm <sup>3</sup>
Relative density	Not determined.
Vapour density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with Water:	Not miscible or difficult to mix
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.
kinematic:	Not determined.
9.2 Other information	No further relevant information available.

**SECTION 10: Stability and reactivity**

10.1 Reactivity	No information known.
10.2 Chemical stability	Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided:	Danger of containers bursting upon heating.
Stable until:	Depletion of inhibitor.
10.3 Possibility of hazardous reactions	Danger of polymerisation
10.5 Incompatible materials:	Oxidizing agents
	Heat
	Light
	Ultraviolet radiation
	Free radical initiators
10.6 Hazardous decomposition products:	Carbon monoxide and carbon dioxide
	Hydrogen fluoride
Additional information:	Unless inhibited, the product can polymerize resulting in a temperature and pressure increase that may rupture the container.

**SECTION 11: Toxicological information**

11.1 Information on toxicological effects	
Acute toxicity:	No effects known.
LD/LC50 values that are relevant for classification:	No data
Skin irritation or corrosion:	May cause irritation
Eye irritation or corrosion:	May cause irritation
Sensitization:	No sensitizing effect known.
Germ cell mutagenicity:	Suspected of causing genetic defects.
Carcinogenicity:	No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
	No effects known.
Reproductive toxicity:	
Specific target organ system toxicity - repeated exposure:	No effects known.
Specific target organ system toxicity - single exposure:	No effects known.
Aspiration hazard:	No effects known.
Other information (about experimental toxicology):	Reproductive effects have been observed on tests with laboratory animals.
	Mutagenic effects have been observed on tests with bacteria.
Additional toxicological information:	To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.


**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.
Additional ecological information:	
General notes:	Do not allow material to be released to the environment without proper governmental permits.
	Water hazard class 1 (Self-assessment): slightly hazardous for water.
	Do not allow undiluted product or large quantities of it to reach ground water, water bodies or sewage system.
	Avoid transfer into the environment.
12.5 Results of PBT and vPvB assessment	
PBT:	Not applicable.
vPvB:	Not applicable.
12.6 Other adverse effects	No further relevant information available.

**SECTION 13: Disposal considerations**

13.1 Waste treatment methods	
Recommendation	Hand over to disposers of hazardous waste.
	Must be specially treated under adherence to official regulations.
	Consult state, local or national regulations for proper disposal.
Uncleaned packagings:	
Recommendation:	Disposal must be made according to official regulations.

**SECTION 14: Transport information**

UN-Number	
ADR, IMDG, IATA	UN3271
14.2 UN proper shipping name	
ADR	3271 ETHERS, N.O.S. (2,2,2-Trifluoroethyl vinyl ether)
IMDG, IATA	ETHERS, N.O.S. (2,2,2-Trifluoroethyl vinyl ether)
14.3 Transport hazard class(es)	
ADR	
	
Class	3 (F1) Flammable liquids.

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Label  
IMDG, IATA

3

Class  
Label3 Flammable liquids.  
3Packing group  
ADR, IMDG, IATA

II

14.5 Environmental hazards:

Not applicable.

14.6 Special precautions for user

Warning: Flammable liquids.

Kemler Number:

33

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:

ADR

Excepted quantities (EQ):

E2

Limited quantities (LQ)

1L

Transport category

2

Tunnel restriction code

D/E

UN "Model Regulation":

UN3271, ETHERS, N.O.S. (2,2,2-Trifluoroethyl vinyl ether), 3, II

**SECTION 15: Regulatory information**

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

Australian Inventory of Chemical

Substances

Substance is not listed.

Standard for the Uniform Scheduling of Drugs and Poisons

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S4

National regulations

Information about limitation of use:

Employment restrictions concerning young persons must be observed.  
For use only by technically qualified individuals.

Water hazard class:

Water hazard class 1 (Self-assessment): slightly hazardous for water.

Other regulations, limitations and prohibitive regulations

ELINCS (European List of Notified Chemical

Substances)

Substance is not listed.

Substances of very high concern (SVHC)

according to REACH, Article 57

Substance is not listed.

REACH - Pre-registered substances

Substance is listed.

15.2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

**SECTION 16: Other information**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing data specification sheet: Health, Safety and Environmental Department.

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)  
 IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)  
 ICAO: International Civil Aviation Organization  
 ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)  
 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 Harmonized System of Classification and Labelling of Chemicals  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent

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