

## 1 Identification

### Product identifier

**Product name:** 2-Chloro-1,1,2-trifluoroethyl difluoromethylether

**Stock number:** L16725

**CAS Number:**

13838-16-9

**EC number:**

237-553-4

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

**Identified use:** SU24 Scientific research and development

### Details of the supplier of the safety data sheet

#### Manufacturer/Supplier:

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

**Information Department:** Health, Safety and Environmental Department

#### Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

**Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)**



GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.

**Hazards not otherwise classified** No information known.

### Label elements

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

### Hazard pictograms



GHS07

### Signal word

Warning

### Hazard statements

H319 Causes serious eye irritation.

### Precautionary statements

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

P264 Wash thoroughly after handling.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists: Get medical advice/attention.

### WHMIS classification

D2B - Toxic material causing other toxic effects



### Classification system

**HMIS ratings (scale 0-4)**

**(Hazardous Materials Identification System)**

**HEALTH** 1 Health (acute effects) = 1

**FIRE** 1 Flammability = 1

**REACTIVITY** 1 Physical Hazard = 1

### Other hazards

### Results of PBT and vPvB assessment

**PBT:** Not applicable.

**vPvB:** Not applicable.

## 3 Composition/information on ingredients

### Chemical characterization: Substances

#### CAS# Description:

13838-16-9 2-Chloro-1,1,2-trifluoroethyl difluoromethylether

#### Identification number(s):

**EC number:** 237-553-4

## 4 First-aid measures

### Description of first aid measures

#### After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

#### After skin contact

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek medical treatment.

### Information for doctor

**Most important symptoms and effects, both acute and delayed** No further relevant information available.

**Product name: 2-Chloro-1,1,2-trifluoroethyl difluoromethylether**

**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

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## 5 Fire-fighting measures

### Extinguishing media

**Suitable extinguishing agents** Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

### Special hazards arising from the substance or mixture

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

Carbon monoxide and carbon dioxide

Hydrogen chloride (HCl)

Hydrogen fluoride (HF)

### Advice for firefighters

### Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

## 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

**Environmental precautions:** Do not allow material to be released to the environment without proper governmental permits.

**Methods and material for containment and cleaning up:** Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**Prevention of secondary hazards:** No special measures required.

### 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.

## 7 Handling and storage

### Handling

### Precautions for safe handling

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

**Information about protection against explosions and fires:** No information known.

### Conditions for safe storage, including any incompatibilities

### Storage

**Requirements to be met by storerooms and receptacles:** No special requirements.

**Information about storage in one common storage facility:** Store away from oxidizing agents.

### Further information about storage conditions:

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**Specific end use(s)** No further relevant information available.

## 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.

### Components with limit values that require monitoring at the workplace:

2-Chloro-1,1,2-trifluoroethyl difluoromethyl ether

ACHIH TLV-TWA 75 ppm

Australia TWA 0.5 ppm

Belgium TWA 75 ppm

Denmark TWA 2 ppm

Germany MAK 20 ppm

Netherlands MAC-TGG 20 ppm

New Zealand TEA 0.5 ppm

Norway TWA 2 ppm

Sweden TWA 10 ppm; STEL 20 ppm

Switzerland MAK-W 10 ppm; KZG-W 80 ppm

United Kingdom TWA 50 ppm

### Control parameters

### Components with limit values that require monitoring at the workplace:

**13838-16-9 2-Chloro-1,1,2-trifluoroethyl difluoromethylether (100.0%)**

REL (USA) Ceiling limit value: 15.1\* mg/m<sup>3</sup>, 2\* ppm  
\*60-min; for exposure to waste anesthetic gases

TLV (USA) Long-term value: 566 mg/m<sup>3</sup>, 75 ppm

EL (Canada) Long-term value: 2 ppm

EV (Canada) Long-term value: 16 mg/m<sup>3</sup>, 2 ppm

**Additional information:** No data

### Exposure controls

### Personal protective equipment

### General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

### Breathing equipment:

Use suitable respirator when high concentrations are present.

Use suitable respiratory protective device in case of insufficient ventilation.

### Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

**Penetration time of glove material (in minutes)** Not determined

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USA

**Product name: 2-Chloro-1,1,2-trifluoroethyl difluoromethylether**

**Eye protection:** Safety glasses  
**Body protection:** Protective work clothing.

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## 9 Physical and chemical properties

### Information on basic physical and chemical properties

#### General Information

##### Appearance:

**Form:** Liquid  
**Color:** Colorless  
**Odor:** Not determined  
**Odor threshold:** Not determined.

**pH-value:** Not determined.

#### Change in condition

**Melting point/Melting range:** Not determined  
**Boiling point/Boiling range:** 56-57 °C (133-135 °F)  
**Sublimation temperature / start:** Not determined

**Flash point:** Not determined  
**Flammability (solid, gaseous):** Not determined.  
**Ignition temperature:** Not determined  
**Decomposition temperature:** Not determined  
**Auto igniting:** Not determined.

**Danger of explosion:** Product does not present an explosion hazard.

#### Explosion limits:

**Lower:** Not determined  
**Upper:** Not determined  
**Vapor pressure:** Not determined  
**Density at 20 °C (68 °F):** 1.517 g/cm<sup>3</sup> (12.659 lbs/gal)  
**Relative density:** Not determined.  
**Vapor 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.  
**Other information:** No further relevant information available.

## 10 Stability and reactivity

**Reactivity:** No information known.

**Chemical stability:** Stable under recommended storage conditions.

**Thermal decomposition / conditions to be avoided:** Decomposition will not occur if used and stored according to specifications.

**Possibility of hazardous reactions:** No dangerous reactions known

**Conditions to avoid:** No further relevant information available.

**Incompatible materials:** Oxidizing agents

**Hazardous decomposition products:**

Carbon monoxide and carbon dioxide

Hydrogen chloride (HCl)

Hydrogen fluoride

## 11 Toxicological information

### 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:** Causes serious eye irritation.

**Sensitization:** No sensitizing effects known.

**Germ cell mutagenicity:** No effects known.

**Carcinogenicity:**

IARC-3: Not classifiable as to carcinogenicity to humans.

ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

**Reproductive toxicity:** No effects known.

**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 human lymphocytes.

Mutagenic effects have been observed on tests with laboratory animals.

**Subacute to chronic toxicity:**

The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Kidney, Ureter, Bladder - urine volume decreased.

Lungs, Thorax, or Respiration - acute pulmonary edema.

Lungs, Thorax, or Respiration - other changes.

Lungs, Thorax, or Respiration - tumors.

Liver - other changes.

Liver - changes in liver weight.

Liver - tumors.

Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).

Reproductive - Effects on Newborn - other postnatal measures or effects.

Reproductive - Specific Developmental Abnormalities - musculoskeletal system.

Reproductive - Specific Developmental Abnormalities - Central Nervous System.

Reproductive - Specific Developmental Abnormalities - craniofacial (including nose and tongue).

Reproductive - Specific Developmental Abnormalities - urogenital system.

Tumorigenic - carcinogenic by RTECS criteria.

**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**Product name: 2-Chloro-1,1,2-trifluoroethyl difluoromethylether**

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## 12 Ecological information

### Toxicity

**Aquatic toxicity:** No further relevant information available.

**Persistence and degradability:** No further relevant information available.

**Bioaccumulative potential:** No further relevant information available.

**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.

Avoid transfer into the environment.

### Results of PBT and vPvB assessment

**PBT:** Not applicable.

**vPvB:** Not applicable.

**Other adverse effects:** No further relevant information available.

## 13 Disposal considerations

### Waste treatment methods

**Recommendation:** Consult state, local or national regulations to ensure proper disposal.

### Uncleaned packagings:

**Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

Not a hazardous material for transportation.

### UN-Number

**DOT, IMDG, IATA** None

### UN proper shipping name

**DOT, IMDG, IATA** None

### Transport hazard class(es)

**DOT, ADR, IMDG, IATA** None

### Class

**DOT, ADR, IMDG, IATA** None

### Packing group

**DOT, IMDG, IATA** None

### Environmental hazards:

**DOT, IMDG, IATA** Not applicable.

### Special precautions for user

**DOT, IMDG, IATA** Not applicable.

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

### Transport/Additional information:

**DOT** Not dangerous according to the above specifications.

### Marine Pollutant (DOT):

**DOT** No

## 15 Regulatory information

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

**GHS label elements:** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

### Hazard pictograms



GHS07

### Signal word

Warning

### Hazard statements

H319 Causes serious eye irritation.

### Precautionary statements

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

P264 Wash thoroughly after handling.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists: Get medical advice/attention.

### National regulations

This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

**SARA Section 313 (specific toxic chemical listings)** Substance is not listed.

### California Proposition 65

**Prop 65 - Chemicals known to cause cancer** Substance is not listed.

**Prop 65 - Developmental toxicity** Substance is not listed.

**Prop 65 - Developmental toxicity, female** Substance is not listed.

**Prop 65 - Developmental toxicity, male** Substance is not listed.

**Information about limitation of use:** For use only by technically qualified individuals.

### Other regulations, limitations and prohibitive regulations

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.** Substance is not listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.

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

## 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 SDS:** Global Marketing Department

**Date of preparation / last revision** 11/24/2015 / -

### 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)

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USA

**Product name: 2-Chloro-1,1,2-trifluoroethyl difluoromethylether**

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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)  
IMDG: International Maritime Code for Dangerous Goods  
DOT: US Department of Transportation  
IATA: International Air Transport Association  
EINECS: European Inventory of Existing Commercial Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
HMIS: Hazardous Materials Identification System (USA)  
WHMIS: Workplace Hazardous Materials Information System (Canada)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
vPvB: very Persistent and very Bioaccumulative  
ACGIH: American Conference of Governmental Industrial Hygienists (USA)  
OSHA: Occupational Safety and Health Administration (USA)  
NTP: National Toxicology Program (USA)  
IARC: International Agency for Research on Cancer  
EPA: Environmental Protection Agency (USA)

USA