

## 1 Identification

### Product identifier

**Product name:** **1-Bromo-1-chloro-2,2,2-trifluoroethane**

**Stock number:** L10179

**CAS Number:**  
151-67-7

**EC number:**  
205-796-5

**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)



GHS08 Health hazard

Muta. 2 H341 Suspected of causing genetic defects.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.

**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



GHS05 GHS08

**Signal word** Danger

### Hazard statements

H318 Causes serious eye damage.

H341 Suspected of causing genetic defects.

### Precautionary statements

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

P281 Use personal protective equipment as required.

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

P310 Immediately call a POISON CENTER/doctor/...

P405 Store locked up.

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

### WHMIS classification

D2A - Very toxic material causing other toxic effects



### Classification system

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

**(Hazardous Materials Identification System)**

HEALTH 2 Health (acute effects) = 2

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:

151-67-7 1-Bromo-1-chloro-2,2,2-trifluoroethane

#### Identification number(s):

EC number: 205-796-5

## 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.

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**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.

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

**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 fluoride (HF)

Hydrogen chloride (HCl)

Hydrogen bromide (HBr)

**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).

Dispose of contaminated material as waste according to section 13.

**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.

Store in the dark.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Protect from exposure to light.

**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:**

1-Bromo-1-chloro-2,2,2-trifluoroethane

ACGIH TLV TWA	50 ppm
Australia TWA	0.5 ppm
Belgium TWA	50 ppm
Finland TWA	1 ppm; 3 ppm-STEL
Hungary TWA	30 mg/m <sup>3</sup> ; 60 mg/m <sup>3</sup> -STEL
Netherlands MAC-TGG	40 mg/m <sup>3</sup>
Poland TWA	40 mg/m <sup>3</sup> ; 100 mg/m <sup>3</sup> -STEL
Russia	20 mg/m <sup>3</sup> -STEL
Sweden NGV	5 ppm; 10 ppm-KTV
Switzerland MAK-W	5 ppm; 10 ppm-KZG-W
Denmark TWA	5 ppm
Germany MAK	41 mg/m <sup>3</sup>
United Kingdom TWA	10 ppm

**Control parameters**

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

**151-67-7 1-Bromo-1-chloro-2,2,2-trifluoroethane (100.0%)**

REL (USA)	Ceiling limit value: 16.2* mg/m <sup>3</sup> , 2* ppm *60-min; for exposure to waste anesthetic gases
TLV (USA)	Long-term value: 404 mg/m <sup>3</sup> , 50 ppm
EL (Canada)	Long-term value: 2 ppm R
EV (Canada)	Long-term value: 16 mg/m <sup>3</sup> , 2 ppm

**Additional information:** No data

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**Product name: 1-Bromo-1-chloro-2,2,2-trifluoroethane**

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**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.

Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use suitable respirator when high concentrations are present.

**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

**Eye protection:** Tightly sealed goggles

**Body protection:** Protective work clothing.

**9 Physical and chemical properties**

**Information on basic physical and chemical properties**

**General Information**

**Appearance:**

<b>Form:</b>	Liquid
<b>Color:</b>	Colorless
<b>Odor:</b>	Not determined
<b>Odor threshold:</b>	Not determined.

<b>pH-value:</b>	Not determined.
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**Change in condition**

<b>Melting point/Melting range:</b>	Not determined
<b>Boiling point/Boiling range:</b>	49-50 °C (120-122 °F)
<b>Sublimation temperature / start:</b>	Not determined

<b>Flash point:</b>	Not determined
<b>Flammability (solid, gaseous)</b>	Not determined.
<b>Ignition temperature:</b>	Not determined
<b>Decomposition temperature:</b>	Not determined
<b>Auto igniting:</b>	Not determined.

<b>Danger of explosion:</b>	Product does not present an explosion hazard.
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**Explosion limits:**

<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined
<b>Vapor pressure:</b>	Not determined
<b>Density at 20 °C (68 °F):</b>	1.872 g/cm <sup>3</sup> (15.622 lbs/gal)
<b>Relative density</b>	Not determined.
<b>Vapor density</b>	Not determined.
<b>Evaporation rate</b>	Not determined.

**Solubility in / Miscibility with**

<b>Water:</b>	Not determined
<b>Partition coefficient (n-octanol/water):</b>	Not determined.

**Viscosity:**

<b>dynamic:</b>	Not determined.
<b>kinematic:</b>	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

Light

**Hazardous decomposition products:**

Carbon monoxide and carbon dioxide

Hydrogen fluoride

Hydrogen chloride (HCl)

Hydrogen bromide

**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:** Irritant to skin and mucous membranes.

**Eye irritation or corrosion:**

Irritating effect.

Causes serious eye damage.

**Sensitization:** No sensitizing effects known.

**Germ cell mutagenicity:** Suspected of causing genetic defects.

**Carcinogenicity:**

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 insects.

Mutagenic effects have been observed on tests with laboratory animals.

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**Product name: 1-Bromo-1-chloro-2,2,2-trifluoroethane**

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**Subacute to chronic toxicity:**

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

- Liver - hepatitis (hepatocellular necrosis), diffuse
- Liver - other changes.
- Liver - fatty liver degeneration.
- Liver - liver function tests impaired.
- Liver - changes in liver weight.
- Blood - changes in serum composition (e.g. TP, bilirubin, cholesterol).
- Blood - hemorrhage.
- Biochemical - Metabolism (Intermediary) - other proteins.
- Biochemical - Metabolism (Intermediary) - lipids including transport.
- Biochemical - Metabolism (Intermediary) - other.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other enzymes.
- Biochemical - Effect on specific coenzyme - not otherwise specified.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other oxidoreductases.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other transferases.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - hepatic microsomal mixed oxidase.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - true cholinesterase.
- Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - cytochrome oxidase (including oxidative phosphorylation).
- Immunological Including Allergic - increase in cellular immune response
- Immunological Including Allergic - other immediate (humoral): urticaria, allergic rhinitis, serum sickness.
- Vascular - regional or general arteriolar or venous dilation.
- Gastrointestinal - nausea or vomiting.
- Gastrointestinal - other changes.
- Nutritional and Gross Metabolic - body temperature increase.
- Nutritional and Gross Metabolic - conditioned vitamin deficiency.
- Nutritional and Gross Metabolic - weight loss or decreased weight gain.
- Behavioral - general anesthetic.
- Behavioral - excitement.
- Behavioral - antipsychotic.
- Brain and Coverings - other degenerative changes.
- Brain and Coverings - recordings from specific areas of CNS.
- Cardiac - change in rate.
- Lungs, Thorax, or Respiration - cyanosis.
- Lungs, Thorax, or Respiration - respiratory depression
- Kidney, Ureter, Bladder - other changes.
- Kidney, Ureter, Bladder - urine volume increased.
- Biochemical - Neurotransmitters or modulators (putative) - dopamine at other sites
- Reproductive - Paternal Effects - testes, epididymis, sperm duct.
- Reproductive - Effects on Newborn - behavioral.
- Reproductive - Specific Developmental Abnormalities - musculoskeletal system.
- Reproductive - Fertility - post-implantation mortality (e.g. dead/or resorbed implants per total number of implants).
- Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).
- Reproductive - Specific Developmental Abnormalities - Central Nervous System.
- Reproductive - Fertility - abortion.
- Reproductive - Specific Developmental Abnormalities - urogenital system.
- Reproductive - Fertility - litter size (e.g. # fetuses per litter; measured before birth).
- Reproductive - Fertility - other measures of fertility.
- Reproductive - Effects on Newborn - growth statistics (e.g.%, reduced weight gain).
- Reproductive - Specific Developmental Abnormalities - craniofacial (including nose and tongue).
- Reproductive - Specific Developmental Abnormalities - other developmental abnormalities.
- Reproductive - Effects on Newborn - weaning or lactation index (e.g., # alive at weaning per # alive at day 4).
- Reproductive - Effects on Newborn - other postnatal measures or effects.

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

**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.
- Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
- 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**

**Class** None

**Packing group**

**DOT, IMDG, IATA** None

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**Product name: 1-Bromo-1-chloro-2,2,2-trifluoroethane**

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<b>Environmental hazards:</b>	Not applicable.
<b>Special precautions for user</b>	Not applicable.
<b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
<b>Transport/Additional information:</b>	Not dangerous according to the above specifications.
<b>DOT</b>	
<b>Marine Pollutant (DOT):</b>	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**



GHS05 GHS08

**Signal word** Danger

### Hazard statements

H318 Causes serious eye damage.  
H341 Suspected of causing genetic defects.

### Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P281 Use personal protective equipment as required.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310 Immediately call a POISON CENTER/doctor/...  
P405 Store locked up.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### National regulations

All components of this product are listed on the Canadian Domestic Substances List (DSL).  
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

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**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** 11/23/2015 / -

### Abbreviations and acronyms:

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)