

**Safety Data Sheet**  
according to 1907/2006/EC, Article 31

Revision: 21.08.2010

Printing date 21.08.2010

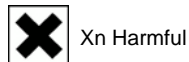
**1 Identification of substance****Product details**

**Trade name** 1,1,2-Trichloro-2,3,3-trifluorocyclobutane  
**Stock number:** L09469

**Manufacturer/Supplier:** Alfa Aesar GmbH & Co.KG  
Benzstrasse 3  
D-76185 Karlsruhe / Germany

E-mail: gcat@matthey.com  
www.alfa-chemcat.com

**Informing department:** Product safety department.  
**Emergency information:** Giftnotruf Universität Mainz / Poison Information Center Mainz  
www.giftinfo.uni-mainz.de Telefon:+49(0)6131/19240

**2 Hazards identification****Hazard designation:**

**Information pertaining to particular dangers for man and environment**  
**GHS label elements**

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.



**Warning**  
H302 - Harmful if swallowed.  
H312 - Harmful in contact with skin.  
H332 - Harmful if inhaled.  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P280 Wear protective gloves/clothing.

**Prevention:****3 Composition/information on ingredients**

**Chemical characterization:**  
**Designation: (CAS#)** 1,1,2-Trichloro-2,3,3-trifluorocyclobutane (CAS# 697-17-6)  
**Identification number(s):**  
**EINECS Number:** 211-804-8

**4 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. Seek immediate medical advice.

**5 Fire fighting measures**

**Suitable extinguishing agents** CO<sub>2</sub>, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.  
**Special hazards caused by the material, its products of combustion or flue gases:** Can be released in case of fire: Carbon monoxide and carbon dioxide  
Hydrogen chloride (HCl)  
Phosgene gas  
Hydrogen fluoride (HF)  
**Protective equipment:** Wear self-contained breathing apparatus. Wear full protective suit.

**6 Accidental release measures**

**Person-related safety precautions:** Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation  
**Measures for environmental protection:** Do not allow material to be released to the environment without proper governmental permits.  
**Measures for cleaning/collecting:** 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.  
**Additional information:** See Section 7 for information on safe handling  
See section 8 for information on personal protection equipment.  
See Section 13 for information on disposal.

**7 Handling and storage**

**Handling**  
**Information for safe handling:** Keep containers tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation/exhaustion at the workplace.  
**Information about protection against explosions and fires:** Keep ignition sources away - Do not smoke.  
**Storage**  
**Requirements to be met by storerooms and containers:** 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.

**8 Exposure controls and 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 critical values that require monitoring at the workplace:** Not required.  
**Additional information:** No data  
**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. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin.

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**Trade name 1,1,2-Trichloro-2,3,3-trifluorocyclobutane**

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<b>Breathing equipment:</b>	Use breathing protection with high concentrations.
<b>Protection of hands:</b>	Check protective gloves prior to each use for their proper condition.
<b>Material of gloves</b>	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.
<b>Penetration time of glove material</b>	Impervious gloves
<b>Eye protection:</b>	Not determined
<b>Body protection:</b>	Safety glasses Protective work clothing.

**9 Physical and chemical properties:**
**General Information**

<b>Form:</b>	Liquid
<b>Colour:</b>	Colourless
<b>Smell:</b>	Not determined

<b>Change in condition</b>	
<b>Melting point/Melting range:</b>	Not determined
<b>Boiling point/Boiling range:</b>	119-120°C
<b>Sublimation temperature / start:</b>	Not determined

<b>Flash point:</b>	Not applicable
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<b>Ignition temperature:</b>	Not determined
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<b>Decomposition temperature:</b>	Not determined
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<b>Danger of explosion:</b>	Product is not explosive.
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<b>Critical values for explosion:</b>	
<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined

<b>Steam pressure:</b>	Not determined
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<b>Density at 20°C</b>	1.594 g/cm <sup>3</sup>
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<b>Solubility in / Miscibility with Water:</b>	Not miscible or difficult to mix
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**10 Stability and reactivity**

<b>Thermal decomposition / conditions to be avoided:</b>	No decomposition if used and stored according to specifications.
<b>Materials to be avoided:</b>	Oxidizing agents Alkali metals Alkaline earth metals
<b>Dangerous reactions:</b>	No dangerous reactions known
<b>Dangerous products of decomposition:</b>	Carbon monoxide and carbon dioxide Hydrogen chloride (HCl) Hydrogen fluoride Phosgen

**11 Toxicological information**

<b>Acute toxicity:</b>	
<b>Primary irritant effect:</b>	
<b>on the skin:</b>	May cause irritation
<b>on the eye:</b>	May cause irritation
<b>Sensitization:</b>	No sensitizing effect known.
<b>Additional toxicological information:</b>	To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. Danger by skin resorption. No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

**12 Ecological information:**

<b>Additional ecological information:</b>	
<b>General notes:</b>	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. Do not allow material to be released to the environment without proper governmental permits.

**13 Disposal considerations**

<b>Product:</b>	
<b>Recommendation</b>	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.
<b>Uncleaned packagings:</b>	
<b>Recommendation:</b>	Disposal must be made according to official regulations.

**14 Transport information**

<b>Land transport ADR/RID and GGVS/GGVE (cross-border/domestic)</b>	
<b>ADR/RID-GGVS/E Class:</b>	None

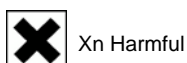
<b>Maritime transport IMDG/GGVSea:</b>	
<b>IMDG/GGVSea Class:</b>	None
<b>Marine pollutant:</b>	No

<b>Air transport ICAO-TI and IATA-DGR:</b>	
<b>ICAO/IATA Class:</b>	9 None

<b>Transport/Additional information:</b>	Not dangerous according to the above specifications.
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**15 Regulatory information**

<b>Designation according to EC guidelines:</b>	
<b>Code letter and hazard designation of product:</b>	



Xn Harmful

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**Risk phrases:** 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.**Safety phrases:** 23 Do not breathe fumes.  
36/37 Wear suitable protective clothing and gloves.**National regulations****Information about limitation of use:** For use only by technically qualified individuals.  
Employment restrictions concerning young persons must be observed.**Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.**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.**Contact:** Zachariah Holt**Abbreviations and acronyms:** ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

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)

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)

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