

# 1,1,2-Trichlorotrifluoroethane

## Safety Data Sheet 1100608

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 01/20/2016

Version: 1.0

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
 Substance name : 1,1,2-Trichlorotrifluoroethane  
 CAS No : 76-13-1  
 Product code : 1100-6-08  
 Formula : C<sub>2</sub>Cl<sub>3</sub>F<sub>3</sub>  
 Synonyms : 1,1,2-Trifluorotrichloroethane  
 Other means of identification : MFCD00000782

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

Use of the substance/mixture : Laboratory chemicals  
 Manufacture of substances  
 Scientific research and development

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

SynQuest Laboratories, Inc.  
 P.O. Box 309  
 Alachua, FL 32615 - United States of America  
 T (386) 462-0788 - F (386) 462-7097  
[info@synquestlabs.com](mailto:info@synquestlabs.com) - [www.synquestlabs.com](http://www.synquestlabs.com)

#### 1.4. Emergency telephone number

Emergency number : (844) 523-4086 (3E Company - Account 10069)

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-US)

Skin Irrit. 2 H315 - Causes skin irritation  
 Eye Irrit. 2A H319 - Causes serious eye irritation  
 STOT SE 3 H335 - May cause respiratory irritation  
 Aquatic Acute 2 H401 - Toxic to aquatic life  
 Aquatic Chronic 2 H411 - Toxic to aquatic life with long lasting effects  
 Ozone 1 H420 - Harms public health and the environment by destroying ozone in the upper atmosphere

Full text of H-phrases: see section 16

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Warning

Hazard statements (GHS-US)

: H315 - Causes skin irritation  
 H319 - Causes serious eye irritation  
 H335 - May cause respiratory irritation  
 H411 - Toxic to aquatic life with long lasting effects  
 H420 - Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary statements (GHS-US)

: P261 - Avoid breathing fumes, mist, spray, vapors  
 P264 - Wash skin thoroughly after handling  
 P271 - Use only outdoors or in a well-ventilated area  
 P273 - Avoid release to the environment  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection  
 P302+P352 - If on skin: Wash with plenty of soap and 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  
 P312 - Call a POISON CENTER or doctor/physician if you feel unwell  
 P321 - Specific treatment (see supplemental first aid instructions on this label)

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P332+P313 - If skin irritation occurs: Get medical advice/attention  
P337+P313 - If eye irritation persists: Get medical advice/attention  
P362+P364 - Take off contaminated clothing and wash it before reuse  
P391 - Collect spillage  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed  
P405 - Store locked up  
P501 - Dispose of contents/container to an approved waste disposal plant  
P502 - Refer to manufacturer/supplier for information on recovery/recycling

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Substance type : Mono-constituent

| Name                                                 | Product identifier | %      | Classification (GHS-US)                                                                                                            |
|------------------------------------------------------|--------------------|--------|------------------------------------------------------------------------------------------------------------------------------------|
| 1,1,2-Trichlorotrifluoroethane<br>(Main constituent) | (CAS No) 76-13-1   | <= 100 | Skin Irrit. 2, H315<br>Eye Irrit. 2A, H319<br>STOT SE 3, H335<br>Aquatic Acute 2, H401<br>Aquatic Chronic 2, H411<br>Ozone 1, H420 |

Full text of H-phrases: see section 16

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get medical advice/attention.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

First-aid measures after ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

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

Symptoms/injuries : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

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

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen chloride. Hydrogen fluoride.

Explosion hazard : Risk of explosion if heated under confinement. Use water spray or fog for cooling exposed containers.

### 5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

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### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. Do not breathe gas, fumes, vapor or spray.

##### 6.1.1. For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

##### 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

Emergency procedures : Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

#### 6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

For containment : Stop leak if safe to do so. Dike for recovery or absorb with appropriate material.

Methods for cleaning up : Take up large spills with pump or vacuum and finish with dry chemical absorbent. Use explosion-proof equipment. Take up small spills with dry chemical absorbent. Sweep or shovel spills into appropriate container for disposal. Ventilate area.

Other information : For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

#### 6.4. Reference to other sections

No additional information available

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Do not breathe fumes, mist, spray, vapors. Wear personal protective equipment. Avoid contact with skin and eyes.

Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.

Storage conditions : Keep container closed when not in use.

Incompatible materials : Refer to Section 10 on Incompatible Materials.

Storage area : Store in dry, cool, well-ventilated area.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

| 1,1,2-Trichlorotrifluoroethane (76-13-1) |                        |            |
|------------------------------------------|------------------------|------------|
| ACGIH                                    | ACGIH TWA (ppm)        | 1000 ppm   |
| ACGIH                                    | ACGIH STEL (ppm)       | 1250 ppm   |
| ACGIH                                    | Remark (ACGIH)         | CNS impair |
| OSHA                                     | OSHA PEL (TWA) (mg/m³) | 7600 mg/m³ |
| OSHA                                     | OSHA PEL (TWA) (ppm)   | 1000 ppm   |

#### 8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection : Protective gloves. 29 CFR 1910.138: Hand Protection.

Eye protection : Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection.

Other information : Safety shoes. 29 CFR 1910.136: Foot Protection.

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### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

|                                             |                                                    |
|---------------------------------------------|----------------------------------------------------|
| Physical state                              | : Liquid                                           |
| Appearance                                  | : Colorless liquid.                                |
| Color                                       | : Colorless                                        |
| Odor                                        | : Sweet ether-like similar to carbon tetrachloride |
| Odor threshold                              | : No data available                                |
| pH                                          | : No data available                                |
| Melting point                               | : -35 °C                                           |
| Freezing point                              | : No data available                                |
| Boiling point                               | : 47 - 48 °C                                       |
| Critical temperature                        | : 214.36 °C                                        |
| Critical pressure                           | : 495.3 psia                                       |
| Flash point                                 | : No data available                                |
| Relative evaporation rate (butyl acetate=1) | : > 1                                              |
| Flammability (solid, gas)                   | : No data available                                |
| Explosion limits                            | : No data available                                |
| Explosive properties                        | : No data available                                |
| Oxidizing properties                        | : No data available                                |
| Vapor pressure                              | : 363 hPa (at 20 °C)                               |
| Relative density                            | : No data available                                |
| Relative vapor density at 20 °C             | : No data available                                |
| Specific gravity / density                  | : 1.553 g/ml (@ 25 °C)                             |
| Molecular mass                              | : 187.38 g/mol                                     |
| Solubility                                  | : Water: 0.17 g/l (at 20 °C)                       |
| Log Pow                                     | : No data available                                |
| Auto-ignition temperature                   | : 680 °C                                           |
| Decomposition temperature                   | : No data available                                |
| Viscosity                                   | : No data available                                |
| Viscosity, kinematic                        | : No data available                                |
| Viscosity, dynamic                          | : No data available                                |

#### 9.2. Other information

|                  |                    |
|------------------|--------------------|
| Refractive index | : 1.3578 (@ 20 °C) |
|------------------|--------------------|

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

The product is stable at normal handling and storage conditions.

#### 10.3. Possibility of hazardous reactions

No additional information available

#### 10.4. Conditions to avoid

Keep away from heat, sparks and flame.

#### 10.5. Incompatible materials

Alkali metals. Finely divided metals (Al, Mg, Zn). Strong bases. Strong oxidizing agents.

#### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

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Acute toxicity : Not classified

| 1,1,2-Trichlorotrifluoroethane (76-13-1) |              |
|------------------------------------------|--------------|
| LD50 oral rat                            | 43 g/kg      |
| LC50 inhalation rat (ppm)                | 52500 ppm/4h |

Skin corrosion/irritation : Causes skin irritation.  
Serious eye damage/irritation : Causes serious eye irritation.  
Respiratory or skin sensitization : Not classified  
Germ cell mutagenicity : Not classified  
Carcinogenicity : Not classified  
Reproductive toxicity : Not classified  
Specific target organ toxicity (single exposure) : May cause respiratory irritation.  
Specific target organ toxicity (repeated exposure) : Not classified  
Aspiration hazard : Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

| 1,1,2-Trichlorotrifluoroethane (76-13-1) |                                                                |
|------------------------------------------|----------------------------------------------------------------|
| LC50 fish 1                              | 6240 mg/l (Exposure time: 96 h - Species: Oryzias latipes)     |
| EC50 Daphnia 1                           | 71 mg/l (Exposure time: 48 h - Species: Daphnia magna)         |
| LC50 fish 2                              | 1250 mg/l (Exposure time: 96 h - Species: Pimephales promelas) |

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Other information : Class I - Group I ozone-depleting substance.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional legislation (waste) : U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII. U.S. - RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards.  
Waste treatment methods : Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.  
Waste disposal recommendations : Dispose of contents/container in accordance with licensed collector's sorting instructions.  
Additional information : Recycle the material as far as possible.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT  
Transport document description : UN3082 Environmentally hazardous substances, liquid, n.o.s., 9, III  
UN-No.(DOT) : UN3082  
Proper Shipping Name (DOT) : Environmentally hazardous substances, liquid, n.o.s.  
Transport hazard class(es) (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

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Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



Packing group (DOT) : III - Minor Danger

Dangerous for the environment : Yes

Marine pollutant : Yes



DOT Packaging Non Bulk (49 CFR 173.xxx) : 203

DOT Packaging Bulk (49 CFR 173.xxx) : 241

DOT Symbols : G - Identifies PSN requiring a technical name

DOT Special Provisions (49 CFR 172.102) : 8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies.

146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.

173 - An appropriate generic entry may be used for this material.

335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s.," UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leak-proof when used as bulk packaging.

IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).

T4 - 2.65 178.274(d)(2) Normal..... 178.275(d)(3)

TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling =  $97 / 1 + a (tr - tf)$  Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

TP29 - A portable tank having a minimum test pressure of 1.5 bar (150.0 kPa) may be used provided the calculated test pressure is 1.5 bar or less based on the MAWP of the hazardous materials, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

DOT Packaging Exceptions (49 CFR 173.xxx) : 155

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : No limit

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : No limit

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Other information : No supplementary information available.

### TDG

No additional information available

### Transport by sea

UN-No. (IMDG) : 3082

Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Class (IMDG) : 9 - Miscellaneous dangerous compounds

Packing group (IMDG) : III - substances presenting low danger

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### Air transport

|                             |                                                       |
|-----------------------------|-------------------------------------------------------|
| UN-No. (IATA)               | : 3082                                                |
| Proper Shipping Name (IATA) | : Environmentally hazardous substance, liquid, n.o.s. |
| Class (IATA)                | : 9 - Miscellaneous Dangerous Goods                   |
| Packing group (IATA)        | : III - Minor Danger                                  |

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### 1,1,2-Trichlorotrifluoroethane (76-13-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Subject to reporting requirements of United States SARA Section 313

|                                       |       |
|---------------------------------------|-------|
| SARA Section 313 - Emission Reporting | 1.0 % |
|---------------------------------------|-------|

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

|                                |                |      |
|--------------------------------|----------------|------|
| 1,1,2-Trichlorotrifluoroethane | CAS No 76-13-1 | 100% |
|--------------------------------|----------------|------|

### 15.2. International regulations

#### CANADA

#### 1,1,2-Trichlorotrifluoroethane (76-13-1)

Listed on the Canadian DSL (Domestic Substances List)

|                      |                                                                 |
|----------------------|-----------------------------------------------------------------|
| WHMIS Classification | Uncontrolled product according to WHMIS classification criteria |
|----------------------|-----------------------------------------------------------------|

### EU-Regulations

No additional information available

### National regulations

#### 1,1,2-Trichlorotrifluoroethane (76-13-1)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
Listed on the Canadian IDL (Ingredient Disclosure List)  
Listed on INSQ (Mexican national Inventory of Chemical Substances)

### 15.3. US State regulations

#### 1,1,2-Trichlorotrifluoroethane (76-13-1)

|                            |                                                                                                                                                                                                                                    |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State or local regulations | U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List<br>U.S. - Pennsylvania - RTK (Right to Know) List |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

## SECTION 16: Other information

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### Full text of H-phrases:

|                   |                                                                                     |
|-------------------|-------------------------------------------------------------------------------------|
| Aquatic Acute 2   | Hazardous to the aquatic environment - Acute Hazard Category 2                      |
| Aquatic Chronic 2 | Hazardous to the aquatic environment - Chronic Hazard Category 2                    |
| Eye Irrit. 2A     | Serious eye damage/eye irritation Category 2A                                       |
| Ozone 1           | Hazardous to the ozone layer Category 1                                             |
| Skin Irrit. 2     | Skin corrosion/irritation Category 2                                                |
| STOT SE 3         | Specific target organ toxicity (single exposure) Category 3                         |
| H315              | Causes skin irritation                                                              |
| H319              | Causes serious eye irritation                                                       |
| H335              | May cause respiratory irritation                                                    |
| H401              | Toxic to aquatic life                                                               |
| H411              | Toxic to aquatic life with long lasting effects                                     |
| H420              | Harms public health and the environment by destroying ozone in the upper atmosphere |

### NFPA health hazard

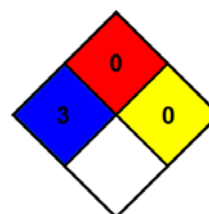
: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

### NFPA fire hazard

: 0 - Materials that will not burn.

### NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



### HMIS III Rating

#### Health

: 0 Minimal Hazard - No significant risk to health

#### Flammability

: 0 Minimal Hazard - Materials that will not burn

#### Physical

: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

### SDS US (GHS HazCom 2012)

*The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.*