

## Chemical Safety Data Sheet MSDS / SDS

## 1,1,1-trichloroethane SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: 1,1,1-trichloroethane

CAS: 71-55-6

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

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

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**SECTION 2: Hazards identification****Classification of the substance or mixture**Acute toxicity - Category 4, Inhalation  
Hazardous to the ozone layer, Category 1

## GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Warning

### Hazard statement(s)

H332 Harmful if inhaled

H420 Harms public health and the environment by destroying ozone in the upper atmosphere

### Precautionary statement(s)

#### Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

#### Response

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P317 Get medical help.

#### Storage

none

#### Disposal

P502 Refer to manufacturer or supplier for information on recovery or recycling

#### Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

### Substance

Chemical name: 1,1,1-trichloroethane

Common names and synonyms:	1,1,1-trichloroethane
CAS number:	71-55-6
EC number:	200-756-3
Concentration:	100%

## SECTION 4: First aid measures

### Description of necessary first-aid measures

#### If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

#### Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### Following ingestion

Do NOT induce vomiting. Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention .

### Most important symptoms/effects, acute and delayed

INHALATION: symptoms range from loss of equilibrium and incoordination to loss of consciousness; high concentration can be fatal due to simple asphyxiation combined with loss of consciousness. INGESTION: produces effects similar to inhalation and may cause some feeling of nausea. EYES: slightly irritating and lachrymatory. SKIN: defatting action may cause dermatitis. (USCG, 1999)

### Indication of immediate medical attention and special treatment needed, if necessary

Emergency and supportive measures: 1. Maintain an open airway and assist ventilation if necessary. Administer supplemental oxygen and treat hydrocarbon aspiration pneumonitis if it occurs. 2. Treat seizures, coma, and arrhythmias if they occur. Caution: Avoid the use of epinephrine or other sympathomimetic amines because of the risk of inducing or aggravating cardiac arrhythmias. Tachyarrhythmias caused by myocardial sensitization may be treated with propranolol ... or esmolol . 3. Monitor for a minimum of 4-6 hours after significant exposure. Trichloroethane, trichloroethylene, and tetrachloroethylene

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Dry chemical, foam, or carbon dioxide

### Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic and irritating gases are generated in fires. (USCG, 1999)

### Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### Environmental precautions

Personal protection: self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### Methods and materials for containment and cleaning up

Environmental considerations: land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. /SRP: If time permits, pits, ponds, lagoons, soak holes, or holding areas should be sealed with an impermeable flexible membrane liner. / Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash, cement powder, or commercial sorbents.

## SECTION 7: Handling and storage

### Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

#### **Conditions for safe storage, including any incompatibilities**

Separated from food and feedstuffs, strong oxidants, aluminium, magnesium and zinc. Cool. Dry. Store in an area without drain or sewer access. Storage temp: Ambient; Venting: Pressure-vacuum.

### **SECTION 8: Exposure controls/personal protection**

#### **Control parameters**

#### **Occupational Exposure limit values**

TLV: 350 ppm as TWA; 450 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued. MAK: 550 mg/m<sup>3</sup>, 100 ppm; peak limitation category: II(2); skin absorption (H); pregnancy risk group: C. EU-OEL: 555 mg/m<sup>3</sup>, 100 ppm as TWA; 1110 mg/m<sup>3</sup>, 200 ppm as STEL

#### **Biological limit values**

no data available

#### **Appropriate engineering controls**

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

#### **Individual protection measures, such as personal protective equipment (PPE)**

##### **Eye/face protection**

Wear safety goggles or eye protection in combination with breathing protection.

##### **Skin protection**

Protective gloves.

##### **Respiratory protection**

Use ventilation, local exhaust or breathing protection.

##### **Thermal hazards**

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Liquid.
Colour:	Colourless.
Odour:	... Mild chloroform-like odor
Melting point/freezing point:	-32 °C.
Boiling point or initial boiling point and boiling range:	74 °C.
Flammability:	Combustible Liquid, but burns with difficulty.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 7.5% by volume; Upper flammable limit: 12.5% by volume
Flash point:	> 20.4 °C. Atm. press.:Ca. 997 mBar.
Auto-ignition temperature:	537 °C. Atm. press.:1 atm.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.00086 Pa.s at 20 deg C
Solubility:	less than 1 mg/mL at 68° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = 2.49. Temperature:20 °C.
Vapour pressure:	133 hPa. Temperature:20 °C.

Density and/or relative density:	1.3.
Relative vapour density:	4.6 (vs air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on burning. This produces toxic and corrosive fumes. Reacts violently with aluminium, aluminium alloys, magnesium, bases, strong oxidants, acetone and zinc.

### Chemical stability

no data available

### Possibility of hazardous reactions

It burns only in excess of oxygen or in air if a strong source of ignition is present. The vapour is heavier than air. 1,1,1-TRICHLOROETHANE decomposes in the presence of chemically active metals. This includes aluminum, magnesium and their alloys. It will react violently with dinitrogen tetroxide, oxygen, liquid oxygen, sodium and sodium-potassium alloys. It will also react violently with acetone, zinc and nitrates. It can react with sodium hydroxide. It is incompatible with strong oxidizers and strong bases. Mixtures with potassium or its alloys are shock-sensitive and may explode on light impact. This chemical can react with an aqueous suspension of calcium hydroxide, and with chlorine in sunlight. It will attack some forms of plastics, rubber and coatings. Upon contact with hot metal or on exposure to ultraviolet radiation, it will decompose to form irritant gases. A cobalt/molybdenum-alumina catalyst will generate a substantial exotherm on contact with its vapor at ambient temperatures. Hazardous reactions also occur with (aluminum oxide + heavy metals). (NTP, 1992).

### Conditions to avoid

no data available

### Incompatible materials

Reacts slowly with water, releasing corrosive hydrochloric acid.

### **Hazardous decomposition products**

When heated to decomposition, it emits irritating gases and toxic fumes of carbon monoxide, carbon dioxide, hydrogen chloride gas, chlorine, and phosgene.

## **SECTION 11: Toxicological information**

### **Acute toxicity**

Oral: LD50 Rat oral 10.3-12.3 g/kg

Inhalation: EC50 (cardiac sensitisation) - dog - ca. 0.7 vol % in air.

Dermal: LD50 - rat - > 2 000 mg/kg bw.

### **Skin corrosion/irritation**

no data available

### **Serious eye damage/irritation**

no data available

### **Respiratory or skin sensitization**

no data available

### **Germ cell mutagenicity**

no data available

### **Carcinogenicity**

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

### **Reproductive toxicity**

Epidemiologic studies have found no relationship between adverse pregnancy outcomes and exposure of mothers or fathers to methyl chloroform. Animal studies have not reported developmental or reproductive effects from exposure to methyl chloroform.

### **STOT-single exposure**



The substance is mildly irritating to the eyes, respiratory tract and skin. The substance may cause effects on the central nervous system. This may result in lowering of consciousness. Exposure at high levels could cause cardiac dysrhythmia.

#### **STOT-repeated exposure**

The substance defats the skin, which may cause dryness or cracking.

#### **Aspiration hazard**

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

### **SECTION 12: Ecological information**

#### **Toxicity**

Toxicity to fish: LC50 - *Pimephales promelas* - 52.8 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: This is a review document that includes both freshwater (*Daphnia*) and marine species.

Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 41 mg/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge, domestic - 360 mg/L - 30 min. Remarks: Respiration rate.

#### **Persistence and degradability**

**AEROBIC:** No degradation was observed in subsurface soils in 27 weeks of incubation; however, in loamy sand, slow degradation was observed under acclimated conditions(1,2). Slow degradation may occur in water under anaerobic or aerated conditions; degradation may take several weeks and acclimation is important(3,4). In seawater, a half-life of 9 months has been determined and vinylidene chloride is the degradation product(5). No degradation in river water was found(6). No utilization of 1,1,1-trichloroethane occurred in a continuously-fed aerobic biofilm reactor that utilized acetate as its primary substrate; however, 98% removal was obtained in a similar anaerobic reactor with a 2-day retention time after 8 wk acclimation(8). 1,1,1-Trichloroethane degraded to vinylidene chloride as a first step in its biotransformation in microcosms containing aquifer water and sediment collected from uncontaminated sites in the Everglades(7); considerable degradation occurred within two weeks(7). Field evidence of biodegradation in aquifers was obtained by following the concentration of 1,1,1-trichloroethane in a confined aquifer after it was injected with reclaimed groundwater(8); the half-life of 1,1,1-trichloroethane was 231 days with biodegradation given as the probable cause of loss(8). The biodegradation half-life of 1,1,1-trichloroethane in non-adapted aerobic soils from Louisiana and Oklahoma were reported as >97 days and >485 days, respectively(9). 1,1,1-Trichloroethane at 100 mg/L achieved 0% of its theoretical BOD using an activated sludge inoculum at 30 mg/L over a 2 week incubation period in the Japanese MITI test(10).

### **Bioaccumulative potential**

A BCF range of 0.7 to 4.9 was measured using carp (*Cyprinus carpio*) which were exposed over an 6-week period(1). A BCF of 8.9 was determined in bluegill sunfish (*Lepomis macrochirus*) in a 28 day test(2). A BCF of 2.95 was measured in killfish (*Oryzias latipes*) over an 8-day exposure period(3). According to a classification scheme(4), these BCF values suggest that bioconcentration in aquatic organisms is low(SRC).

### **Mobility in soil**

The adsorption of 1,1,1-trichloroethane was studied using three US soils(1); equilibrium adsorption coefficients ( $K_d$ ) of 1.8, 1.592, and 1.338 were measured using a soil from Missouri (11.4% sand, 52.7% silt, 33.4% clay, 2.4% organic matter), California (45.1% sand, 35.2% silt, 21.7% clay, 1.7% organic matter) and Florida (9.17% sand, 6.3% silt, 2% clay, 1.6% organic matter), respectively(1); these adsorption coefficients correspond to Koc values of 120 (Missouri soil), 151 (California soil) and 135 (Florida soil). A Koc value of 66 was reported for 1,1,1-trichloroethane in an unspecified soil(2). According to a classification scheme(3), these Koc values suggests that 1,1,1-trichloroethane is expected to have high mobility in soil(SRC).

### **Other adverse effects**

no data available

## **SECTION 13: Disposal considerations**

### **Disposal methods**

#### **Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### **Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## **SECTION 14: Transport information**

### **UN Number**

ADR/RID: UN2831 (For reference only, please check.)

IMDG: UN2831 (For reference only, please check.)

IATA: UN2831 (For reference only, please check.)

#### **UN Proper Shipping Name**

ADR/RID: 1,1,1-TRICHLOROETHANE (For reference only, please check.)

IMDG: 1,1,1-TRICHLOROETHANE (For reference only, please check.)

IATA: 1,1,1-TRICHLOROETHANE (For reference only, please check.)

#### **Transport hazard class(es)**

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

#### **Packing group, if applicable**

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

#### **Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

#### **Special precautions for user**

no data available

#### **Transport in bulk according to IMO instruments**

no data available

## **SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

**SECTION 16: Other information**

**Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

### Other Information

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions. The substance burns only in excess oxygen or if a strong source of ignition is present. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance; consult an expert. Depending on the degree of exposure, periodic medical examination is suggested. Use of alcoholic beverages enhances the harmful effect.

Disclaimer: 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 applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any