

1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

TTF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	Liquid	Colorless	Sweet, ether-like odor
Freon 113 Frigen 113TR 1,1,2-Trichlorotrifluoroethane	Sinks in water.		
<p style="color: red;">Wear self-contained positive pressure breathing apparatus and full impervious protective clothing. Evacuate area in case of large discharge. Notify local health and pollution control agencies.</p>			
Fire	<p>Not flammable. POISONOUS GASES ARE PRODUCED IN FIRE. Container may explode in fire. Wear self-contained positive pressure breathing apparatus, impervious clothing and gloves. Extinguish adjacent fires with water spray, fog or foam, carbon dioxide, or dry chemical. Cool exposed containers with water spray.</p>		
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose, throat, lungs and skin. If inhaled, anesthetic or narcotic effect may occur. Asphyxiant. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Irritating to skin and eyes. IF IN EYES OR ON SKIN, hold eyelids open and flush with water for at least 15 minutes; hold eyelids open if necessary. Remove contaminated clothing and shoes at the site.</p>		
Water Pollution	<p>Effect of low concentrations on aquatic life if unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.</p>		

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Collection Systems: Pump; Dredge

2. CHEMICAL DESIGNATIONS

- 2.1 **CG Compatibility Group:** 36; Halogenated hydrocarbons
2.2 **Formula:** CCl₂FCF₂Cl
2.3 **IMO/UN Designation:** Currently not available
2.4 **DOT ID No.:** Not listed.
2.5 **CAS Registry No.:** 76-13-1
2.6 **NAERG Guide No.:** Not listed
2.7 **Standard Industrial Trade Classification:** 51137

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Self-contained positive pressure breathing apparatus and full protective clothing.
- 3.2 **Symptoms Following Exposure:** Inhalation causes irritation of the nose, throat, and lungs. High concentrations may cause death by respiratory failure or asphyxiation. May produce superficial skin burns or defatting type dermatitis and may irritate the eyes.
- 3.3 **Treatment of Exposure:** Call for medical aid. INHALATION: Move to fresh air. If breathing stops, give artificial respiration. If breathing is difficult, give oxygen. INGESTION: Treat symptomatically and supportively. EYES OR SKIN: Flush with running water for at least 15 minutes; hold eyelids open if necessary. Clean skin with soap or mild detergent. Remove and isolate contaminated clothing and shoes at the site.
- 3.4 **TLV-TWA:** 1000 ppm.
3.5 **TLV-STEL:** 1250 ppm
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Grade 1; LD₅₀ = 43 g/kg (rat)
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Chronic inhalation may cause cardiac arrhythmias. Poisoning may affect liver and kidneys.
3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will not tolerate moderate or high concentrations.
3.11 **Liquid or Solid Characteristics:** Minimum hazard. If spilled on skin and allowed to remain, may cause smarting and reddening of the skin.
3.12 **Odor Threshold:** 45 ppm.
3.13 **IDLH Value:** 2,000 ppm.
3.14 **OSHA PEL-TWA:** 1,000 ppm
3.15 **OSHA PEL-STEL:** Not listed.
3.16 **OSHA PEL-Ceiling:** Not listed.
3.17 **EPA AEGL:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:**
Not flammable.
- 4.2 **Flammable Limits in Air:** Not pertinent.
- 4.3 **Fire Extinguishing Agents:** Extinguish fires with material appropriate to the surrounding materials.
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent.
- 4.5 **Special Hazards of Combustion Products:** Toxic gases including hydrogen chloride, hydrogen fluoride, and very small amounts of phosgene, fluorine and chlorine are produced.
- 4.6 **Behavior in Fire:** While no flash point is reported, the material may burn if ignited by a high intensity heat source.
- 4.7 **Auto Ignition Temperature:** Not pertinent.
- 4.8 **Electrical Hazards:** Not listed.
- 4.9 **Burning Rate:** Not pertinent.
- 4.10 **Adiabatic Flame Temperature:** Not pertinent.
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
- 4.12 **Flame Temperature:** Not pertinent.
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction.
- 5.2 **Reactivity with Common Materials:** Incompatible with alkali metals, with which violent reactions are possible. May form shock sensitive or explosive mixtures with powdered metals.
- 5.3 **Stability During Transport:** Stable.
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent.
- 5.5 **Polymerization:** Will not polymerize.
- 5.6 **Inhibitor of Polymerization:** Not pertinent.

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
Currently not available
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):**
Currently not available
- 6.4 **Food Chain Concentration Potential:**
Currently not available
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 0
Human Contact hazard: 1
Reduction of amenities: X

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Technical grades; 99.9%.
- 7.2 **Storage Temperature:** Ambient.
- 7.3 **Inert Atmosphere:** No requirement.
- 7.4 **Venting:** Open.
- 7.5 **IMO Pollution Category:** C
- 7.6 **Ship Type:** 3
- 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed.
- 8.2 **49 CFR Class:** Not pertinent.
- 8.3 **49 CFR Package Group:** Not listed.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:** Not listed
- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid
- 9.2 **Molecular Weight:** 187.37
- 9.3 **Boiling Point at 1 atm:** 118°F = 48°C = 321°K
- 9.4 **Freezing Point:** -34°F = -36°C = 237°K
- 9.5 **Critical Temperature:** Currently not available
- 9.6 **Critical Pressure:** Currently not available
- 9.7 **Specific Gravity:** 1.5635 at 25°C
- 9.8 **Liquid Surface Tension:** Currently not available
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** 6.47
- 9.11 **Ratio of Specific Heats of Vapor (Gas):**
Currently not available
- 9.12 **Latent Heat of Vaporization:** Currently not available
- 9.13 **Heat of Combustion:** Currently not available
- 9.14 **Heat of Decomposition:** Currently not available
- 9.15 **Heat of Solution:** Currently not available
- 9.16 **Heat of Polymerization:** Not pertinent.
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
77	13.050		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L E	120	0.497

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
77	0.017	68	5.493	68	0.18165		C U R R E N T L Y N O T A V A I L A B L E