# VINYLTRICHLOROSILANE

VTS

## CAUTIONARY RESPONSE INFORMATION

**Common Synonyms**
Trichlorovinylsilane
Trichlorovinyl silicane
Vinyl silicon trichloride

Liquid | Colorless to light yellow | Sharp choking odor

Reacts violently with water. Irritating gas is produced on contact with water.

Evacuate.
Keep people away. Avoid contact with liquid and vapor.
Shut off ignition sources. Call fire department.
Notify local health and pollution control agencies.
Protect water intakes.
Do not add water to undissolved material.

**Fire**

FLAMMABLE.
POISONOUS GASES MAY BE PRODUCED IN FIRE.
Containers may explode in fire.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Extinguish with dry chemicals or carbon dioxide.
DO NOT USE WATER OR FOAM ON FIRE.
Cool exposed containers with water.

**Exposure**

Call for medical aid.

VAPOR
Irritating to eyes, nose and throat.
Harmful if inhaled.
Move victim to fresh air.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

**Water Pollution**

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse dissolved material
Do not add water to undissolved material
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not burn

### 2. CHEMICAL DESIGNATIONS

**2.1 CG Compatibility Group:** Not listed.
**2.2 Formula:** $CH_2$=$CHSiCl_3$
**2.3 IMO/UN Designation:** 3.2/1305
**2.4 DOT ID No.:** 1305
**2.5 CAS Registry No.:** 75-94-5
**2.6 NAERG Guide No.:** 155
**2.7 Standard Industrial Trade Classification:** 51550

### 3. HEALTH HAZARDS

**3.1 Personal Protective Equipment:** Acid-vapor-type respiratory protection; rubber gloves; chemical worker's goggles; other protective equipment asnecessary to protect skin and eyes.
**3.2 Symptoms Following Exposure:** Inhalation causes irritation of mucous membranes. Vapor irritates eyes. Contact with liquid causes severe burns of eyes and skin. Ingestion causes burns of mouth and stomach.
**3.3 Treatment of Exposure:** Get medical attention following all exposures to this compound. INHALATION: remove victim from exposure; give artificial respiration if required. EYES: flush with water for 15 min. SKIN: flush with water. INGESTION: do NOT induce vomiting; give large amount of water.
**3.4 TLV-TWA:** Not listed.
**3.5 TLV-STEL:** Not listed.
**3.6 TLV-Ceiling:** Not listed.
**3.7 Toxicity by Ingestion:** Grade 2; oral $LD_{50}$ = 1,280 mg/kg (rat)
**3.8 Toxicity by Inhalation:** Currently not available.
**3.9 Chronic Toxicity:** Currently not available
**3.10 Vapor (Gas) Irritant Characteristics:** Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.
**3.11 Liquid or Solid Characteristics:** Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes.
**3.12 Odor Threshold:** Currently not available
**3.13 IDLH Value:** Not listed.
**3.14 OSHA PEL-TWA:** Not listed.
**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:** 70°F C.C.
**4.2 Flammable Limits in Air:** 3% (LFL)
**4.3 Fire Extinguishing Agents:** Dry chemical, carbon dioxide
**4.4 Fire Extinguishing Agents Not to Be Used:** Water, foam
**4.5 Special Hazards of Combustion Products:** Toxic chlorine and phosgene gases may be formed in fires.
**4.6 Behavior in Fire:** Difficult to extinguish; re-ignition may occur. Contact with water applied to adjacent fires produces irritating hydrogen chloride gas.
**4.7 Auto Ignition Temperature:** 505°F
**4.8 Electrical Hazards:** Currently not available
**4.9 Burning Rate:** 2.9 mm/min.
**4.10 Adiabatic Flame Temperature:** Currently not available
**4.11 Stoichometric Air to Fuel Ratio:** 14.3 (calc.)
**4.12 Flame Temperature:** Currently not available
**4.13 Combustion Molar Ratio (Reactant to Product):** 6.0 (calc.)
**4.14 Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

**5.1 Reactivity with Water:** Reacts vigorously, evolving hydrogen chloride (hydrochloric acid)
**5.2 Reactivity with Common Materials:** Reacts with surface moisture to evolve hydrogen chloride, which will corrode common metals and form flammable hydrogen gas.
**5.3 Stability During Transport:** Stable if protected from mositure
**5.4 Neutralizing Agents for Acids and Caustics:** Flush with water, rinse with sodium bicarbonate or lime solution.
**5.5 Polymerization:** May occur in absence of inhibitor
**5.6 Inhibitor of Polymerization:** Diphenylamine; Hydroquinone

### 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:** None
**6.5 GESAMP Hazard Profile:**
**Bioaccumulation:** 0
**Damage to living resources:** (1)
**Human Oral hazard:** 1
**Human Contact hazard:** II
**Reduction of amenities:** XX

### 7. SHIPPING INFORMATION

**7.1 Grades of Purity:** 96+%; 98.5+%
**7.2 Storage Temperature:** Ambient
**7.3 Inert Atmosphere:** No requirement
**7.4 Venting:** Pressure-vacuum
**7.5 IMO Pollution Category:** Currently not available
**7.6 Ship Type:** Currently not available
**7.7 Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

**8.1 49 CFR Category:** Flammable liquid
**8.2 49 CFR Class:** 3
**8.3 49 CFR Package Group:** I
**8.4 Marine Pollutant:** No
**8.5 NFPA Hazard Classification:**

| Category | Classification |
|---|---|
| Health Hazard (Blue)..... | 3 |
| Flammability (Red)..... | 3 |
| Instability (Yellow)..... | 2 |
| Special (White)..... | W |

**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:** 161.5
**9.3 Boiling Point at 1 atm:** 195.1°F = 90.6°C = 363.8°K
**9.4 Freezing Point:** –139°F = –95°C = 178°K
**9.5 Critical Temperature:** Not pertinent
**9.6 Critical Pressure:** Not pertinent
**9.7 Specific Gravity:** 1.26 at 20°C (liquid)
**9.8 Liquid Surface Tension:** (est.) 28 dynes/cm = 0.028 N/m at 20°C
**9.9 Liquid Water Interfacial Tension:** Not pertinent
**9.10 Vapor (Gas) Specific Gravity:** 5.61
**9.11 Ratio of Specific Heats of Vapor (Gas):** Currently not available
**9.12 Latent Heat of Vaporization:** 88 Btu/lb = 49 cal/g = 2.0 X $10^5$ J/kg
**9.13 Heat of Combustion:** (est.) –4,300 Btu/lb = –2,400 cal/g = –100 X $10^5$ J/kg
**9.14 Heat of Decomposition:** Not pertinent
**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

| Temperature (degrees F) | Pounds per cubic foot |
|---|---|
| 34 | 80.139 |
| 36 | 80.070 |
| 38 | 80.000 |
| 40 | 79.929 |
| 42 | 79.870 |
| 44 | 79.799 |
| 46 | 79.730 |
| 48 | 79.660 |
| 50 | 79.589 |
| 52 | 79.520 |
| 54 | 79.450 |
| 56 | 79.379 |
| 58 | 79.309 |
| 60 | 79.240 |
| 62 | 79.169 |
| 64 | 79.099 |
| 66 | 79.030 |
| 68 | 78.959 |
| 70 | 78.889 |
| 72 | 78.830 |
| 74 | 78.759 |
| 76 | 78.690 |
| 78 | 78.620 |
| 80 | 78.549 |
| 82 | 78.480 |
| 84 | 78.410 |

### 9.21 LIQUID HEAT CAPACITY

| Temperature (degrees F) | British thermal unit per pound-F |
|---|---|
| 70 | 0.200 |
| 75 | 0.200 |
| 80 | 0.200 |
| 85 | 0.200 |
| 90 | 0.200 |
| 95 | 0.200 |
| 100 | 0.200 |
| 105 | 0.200 |
| 110 | 0.200 |
| 115 | 0.200 |
| 120 | 0.200 |
| 125 | 0.200 |
| 130 | 0.200 |
| 135 | 0.200 |
| 140 | 0.200 |

### 9.22 LIQUID THERMAL CONDUCTIVITY

| Temperature (degrees F) | British thermal unit inch per hour-square foot-F |
|---|---|
| 70 | 0.887 |
| 72 | 0.887 |
| 74 | 0.887 |
| 76 | 0.887 |
| 78 | 0.887 |
| 80 | 0.887 |
| 82 | 0.887 |
| 84 | 0.887 |
| 86 | 0.887 |
| 88 | 0.887 |
| 90 | 0.887 |
| 92 | 0.887 |
| 94 | 0.887 |
| 96 | 0.887 |
| 98 | 0.887 |
| 100 | 0.887 |
| 102 | 0.887 |
| 104 | 0.887 |

### 9.23 LIQUID VISCOSITY

| Temperature (degrees F) | Centipoise |
|---|---|
| 60 | 0.687 |
| 61 | 0.684 |
| 62 | 0.680 |
| 63 | 0.676 |
| 64 | 0.673 |
| 65 | 0.669 |
| 66 | 0.666 |
| 67 | 0.662 |
| 68 | 0.659 |
| 69 | 0.656 |
| 70 | 0.652 |
| 71 | 0.649 |
| 72 | 0.646 |
| 73 | 0.642 |
| 74 | 0.639 |
| 75 | 0.636 |
| 76 | 0.633 |
| 77 | 0.629 |
| 78 | 0.626 |
| 79 | 0.623 |
| 80 | 0.620 |
| 81 | 0.617 |
| 82 | 0.614 |
| 83 | 0.611 |
| 84 | 0.608 |
| 85 | 0.605 |

### 9.24 SOLUBILITY IN WATER

| Temperature (degrees F) | Pounds per 100 pounds of water |
|---|---|
| | REACTS |

### 9.25 SATURATED VAPOR PRESSURE

| Temperature (degrees F) | Pounds per square inch |
|---|---|
| 40 | 0.459 |
| 50 | 0.612 |
| 60 | 0.806 |
| 70 | 1.051 |
| 80 | 1.356 |
| 90 | 1.735 |
| 100 | 2.199 |
| 110 | 2.765 |
| 120 | 3.449 |
| 130 | 4.269 |
| 140 | 5.248 |
| 150 | 6.407 |
| 160 | 7.772 |
| 170 | 9.370 |
| 180 | 11.230 |
| 190 | 13.390 |
| 200 | 15.870 |
| 210 | 18.720 |

### 9.26 SATURATED VAPOR DENSITY

| Temperature (degrees F) | Pounds per cubic foot |
|---|---|
| 40 | 0.01383 |
| 50 | 0.01806 |
| 60 | 0.02334 |
| 70 | 0.02985 |
| 80 | 0.03781 |
| 90 | 0.04748 |
| 100 | 0.05912 |
| 110 | 0.07302 |
| 120 | 0.08951 |
| 130 | 0.10890 |
| 140 | 0.13170 |
| 150 | 0.15810 |
| 160 | 0.18870 |
| 170 | 0.22390 |
| 180 | 0.26420 |
| 190 | 0.31000 |
| 200 | 0.36200 |
| 210 | 0.42060 |

### 9.27 IDEAL GAS HEAT CAPACITY

| Temperature (degrees F) | British thermal unit per pound-F |
|---|---|
| | NOT PERTINENT |