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MATERIAL  
SAFETY  
DATA SHEET

No. 152

PRODUCT NAME Trichlorosilane	CAS # 10025-78-2
TRADE NAME AND SYNONYMS Trichlorosilane (D.O.T.); Trichloromonosilane	DOT I.D. No.: UN 1295
CHEMICAL NAME AND SYNONYMS Trichlorosilane	DOT Hazard Class: Division 4.3
ISSUE DATES AND REVISIONS Revised January 1995	Formula SiHCl <sub>3</sub>
	Chemical Family: Chlorosilane

### HEALTH HAZARD DATA

#### TIME WEIGHTED AVERAGE EXPOSURE LIMIT

None listed (ACGIH 1994-1995). Hydrogen chloride (hydrolysis product) ceiling limit = 5 Molar PPM. OSHA 1993 ceiling limit for HCl = 5 Molar PPM.

#### SYMPTOMS OF EXPOSURE

Corrosive and irritating to the upper and lower respiratory tracts, skin and eyes. It hydrolyzes very rapidly in water or with the moisture in the air yielding hydrogen chloride. Skin burns and mucosal irritation are like that from exposure to hydrochloric acid. Symptoms include lacrymation, cough, labored breathing and excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonitis and pulmonary edema which could be fatal. Hydrochloric acid burns exhibit severe pain, redness, possible swelling and early necrosis.

#### TOXICOLOGICAL PROPERTIES

Trichlorosilane is irritating and corrosive to all living tissues. Toxic level exposure to dermal tissue causes hydrochloric acid burns and skin lesions resulting in early necrosis and scarring. Chemical pneumonitis and pulmonary edema result from exposure to the lower respiratory tract and deep lung. Residual pulmonary malfunction might also occur. Burns to the eye result in lesions and possible loss of vision.

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#### RECOMMENDED FIRST AID TREATMENT

**PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO TRICHLOROSILANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.**

**Inhalation:** Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area and given assisted respiration and supplemental oxygen. Keep the victim warm and quiet. Assure that mucus or vomited material does not obstruct the airway by positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.

Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

**HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES**

Reacts vigorously with water or moist air yielding hydrogen chloride. It is also flammable in air over a very wide range. Also reacts violently with oxidizers and organic materials and very rapidly with alcohols, amines, acetone and ammonia.

**PHYSICAL DATA**

BOILING POINT 90° (32°C)	LIQUID DENSITY AT BOILING POINT @ 77°F (25°C) + 83 lb/ft <sup>3</sup> (1330 kg/m <sup>3</sup> )
VAPOR PRESSURE @ 68°F (20°C) = 9.67 psia (67 kPa)	GAS DENSITY AT 70°F, 1 atm .352 lb/ft <sup>3</sup> (5.64 kg/m <sup>3</sup> )
SOLUBILITY IN WATER Reacts violently	FREEZING POINT -195.7°F (-116.5°C)
EVAPORATION RATE (Ether = 1) = <1	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 4.7
APPEARANCE AND ODOR Colorless liquid which on vaporization forms dense, acrid, acidic fumes.	

**FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT (Method used) 7°F (-13 C) (CC)	AUTO IGNITION TEMPERATURE Unknown	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL 7 UEL 83
EXTINGUISHING MEDIA Carbon dioxide or dry chemical for small fires. Coarse water spray for large fires.		ELECTRICAL CLASSIFICATION Not specified
SPECIAL FIRE FIGHTING PROCEDURES A coarse water spray should be used on large fires since the hydrolysis reaction to HCl is more rapid than the combustion reaction.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Recognize the potential for ground (water) contamination with hydrochloric acid following a trichlorosilane fire which has been "extinguished" with water.		

**REACTIVITY DATA**

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) Water, oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS Hydrogen chloride, hydrogen, chlorine and finely divided amorphous silica		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID None
Will Not Occur	X	

**SPILL OR LEAK PROCEDURES**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container, contact your closest supplier location or call the emergency telephone number listed herein.
WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container to your supplier for proper disposal. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

### SPECIAL PROTECTION INFORMATION

<b>RESPIRATORY PROTECTION</b> (Specify type)	Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.		
<b>VENTILATION</b>  Hood with forced ventilation	<b>LOCAL EXHAUST</b> To prevent accumulation above the Ceiling Limit for HCl	<b>SPECIAL</b>	N/A
	<b>MECHANICAL (Gen.)</b> N/A	<b>OTHER</b>	N/A
<b>PROTECTIVE GLOVES</b> Natural rubber, PVC or polyethylene (low density)			
<b>EYE PROTECTION</b> Safety goggles or glasses			
<b>OTHER PROTECTIVE EQUIPMENT</b> Safety shoes, safety shower, eyewash "fountain," face shield			

### SPECIAL PRECAUTIONS\*

<b>SPECIAL LABELING INFORMATION</b>	DOT Shipping Name: Trichlorosilane <span style="float: right;">DOT Hazard Class: Division 4.3</span> DOT Shipping Labels: Dangerous When Wet, Flammable Liquid, Corrosive I.D. No.: UN 1295		
<b>SPECIAL HANDLING RECOMMENDATIONS</b>	Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll containers. Use a suitable hand truck for container movement. Do not heat container by any means to increase the discharge rate of product from the container. Use a check valve or trap in the discharge line to prevent hazardous back flow into the container.  For additional handling recommendations consult Compressed Gas Association Pamphlet P-1.		
<b>SPECIAL STORAGE RECOMMENDATIONS</b>	Protect containers from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where containers are stored to exceed 125F (52C). Containers should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty containers should be segregated. Use a "first in - first out" inventory system to prevent full containers being stored for excessive periods of time. Post "No Smoking or Open Flame" signs in the storage or use area. There should be no sources of ignition in the storage or use area.  For additional storage recommendations consult Compressed Gas Association Pamphlet P-1.		
<b>SPECIAL PACKAGING RECOMMENDATIONS</b>	Any materials suitable for use with anhydrous hydrogen chloride may be used with trichlorosilane. Systems and equipment must be scrupulously dry.		
<b>OTHER RECOMMENDATIONS OR PRECAUTIONS</b>	Earth-ground and bond all lines and equipment associated with the trichlorosilane system. Electrical equipment should be non-sparking or explosion proof. Compressed gas containers should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas container which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).		

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\*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

HEALTH HAZARD DATATOXICOLOGICAL PROPERTIES: (Continued)

Trichlorosilane is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health where such illness would be aggravated by exposure to trichlorosilane should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT: (Continued)

Eye Contact: PERSONS WITH POTENTIAL EXPOSURE TO TRICHLOROSILANE SHOULD NOT WEAR CONTACT LENSES.

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

Skin Contact: Flush affected area with copious quantities of water. Remove affected clothing as rapidly as possible.

SPECIAL PRECAUTIONSOTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure containers in an upright position before transporting them. NEVER transport containers in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport containers secured in open flatbed or in open pick-up type vehicles.

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 No. for trichlorosilane = 3 4 2 W = Water Reactive