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MATERIAL
 SAFETY
 DATA SHEET

No. 115

PRODUCT NAME Dichlorosilane	CAS # 4109-96-0
TRADE NAME AND SYNONYMS Cichlorosilane	DOT I.D. No.: UN 2189
CHEMICAL NAME AND SYNONYMS Dichlorosilane	DOT Hazard Class: Division 2.3
ISSUE DATES AND REVISIONS Revised January 1995	Formula SiH₂Cl₂
	Chemical Family: Chloro Silane

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT TWA = None listed (ACGIH 1994-1995). Hydrogen chloride (on hydrolysis) ceiling limit = 5 Molar PPM. OSHA 1993 HCl ceiling limit = 5 Molar PPM.</p>
<p>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 mucousal 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.</p>
<p>TOXICOLOGICAL PROPERTIES Dichlorosilane 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. Dichlorosilane is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. (Continued on Page 4)</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO DICHLOROSILANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. <u>Inhalation:</u> 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. (Continued on Page 4)</p>

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Dichlorosilane

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.

PHYSICAL DATA

BOILING POINT 47.1°F (8.4°C)	LIQUID DENSITY AT BOILING POINT 78.7 lbJft ³ (1261 kg/m ³)
VAPOR PRESSURE @ 70°F (21.1°C) = 22.5 psia (155 kPa)	GAS DENSITY AT 70°F, 1 atm 0.261 lb/ft ³ (4.18 kg/m ³)
SOLUBILITY IN WATER Hydrolyzes	FREEZING POINT -188°F (-122°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 3.48
APPEARANCE AND ODOR Colorless gas with acidic, irritating odor	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) 62°F (C.C.)	AUTO IGNITION TEMPERATURE 212°F (100°C)	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL 4.1 UEL98.8
EXTINGUISHING MEDIA Carbon dioxide or dry chemical on small fires. Coarse water spray on 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 dichlorosilane 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 or container valve, 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 <u>properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place</u> to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

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

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	DOT Shipping Name: Dichlorosilane DOT Shipping Label(s): Toxic Gas; Flammable Gas; Corrosive	DOT Hazard Class: Division 2.3 II I.D. No.: UN 2189
SPECIAL HANDLING RECOMMENDATIONS 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 cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<7S psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. For additional handling recommendations, consult Compressed Gas Association's Pamphlet P-1.		
SPECIAL STORAGE RECOMMENDATIONS Protect cylinders 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 cylinders are stored to exceed 125F (52C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" 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's Pamphlet P-1		
SPECIAL PACKAGING RECOMMENDATIONS Any materials suitable for use with anhydrous hydrogen chloride may be used with dichlorosilane Systems and equipment must be kept scrupulously dry.		
OTHER RECOMMENDATIONS OR PRECAUTIONS Earth-ground and bond all lines and equipment associated with the dichlorosilane system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR). (Continued on Page 4)		

*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.

Dichlorosilane

HEALTH HAZARD DATA

TOXICOLOGICAL PROPERTIES: (Continued)

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

RECOMMENDED FIRST AID TREATMENT: (Continued)

Eye Contact: PERSONS WITH POTENTIAL EXPOSURE TO DICHLOROSILANE 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 PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

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

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

NFPA 704 No. for dichlorosilane = 4 4 2 W= Water Reactive