Ehsan International Gases

Dichlorosilane

1.Identification

GHS product identifier	: Dichlorosilane
Chemical name	: dichlorosilane
Other means of identification	: Silane, dichloro-
Product use	
Synonym SDS #	: Synthetic/Analytical chemistry.
Supplier's details	: Silane, dichloro- : 001074
	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Emergency telephone number (with hours of operation)	: 1-866-734-3438

Manufacturer / Distributor:

Ehsan International Gases
40/9, Aurangabad, Nazimabad
#3, Karachi 74600, Pakistan.
+92 21 36612091 – 36612907
info@ehsan.com.pk
www.ehsan.com.pk

2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture GHS label elements : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas
ACUTE TOXICITY (inhalation) - Category 2
SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1

Hazard pictograms :

Signal word : Danger

Dichlorosilane

Hazard statements : Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
May cause frostbite.
Fatal if inhaled.
Causes severe skin burns and eye damage.
Reacts violently with water.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use.
Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention : Never Put cylinders into unventilated areas of passenger vehicles. Wear protective gloves. Wear eye or face protection. Wear respiratory protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use only outdoors or in a well-ventilated area. Do not breathe gas. Wash hands thoroughly after handling. Use and store only outdoors or in a well ventilated place.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or physician. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage : Store locked up. Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
Reacts violently with water.

3. Composition/information on ingredients

Substance/mixture : Substance
Chemical name : dichlorosilane
Other means of identification : Silane, dichloro-

CAS number/other identifiers

CAS number : 4109-96-0
Product code : 001074

Ingredient name	%	CAS number
Dichlorosilane	100	4109-96-0

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Description of necessary first aid measures

4. First aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes.
Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Fatal if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Skin contact : Causes severe burns.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : May cause burns to mouth, throat and stomach. As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following: pain or irritation redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

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

Notes to physician	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	No specific treatment.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. Fire-fighting measures

Extinguishing media	:	Use an extinguishing agent suitable for the surrounding fire.
Suitable extinguishing media	:	
Unsuitable extinguishing media		None known.

Specific hazards arising from the chemical	:	Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion.
Hazardous thermal decomposition products	:	Decomposition products may include the following materials: halogenated compounds metal oxide/oxides
Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".
Environmental precautions	:	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

7. Handling and storage

Small spill	:	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
Large spill	:	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosionproof electrical (ventilating, lighting and material handling) equipment. Use only nonsparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

8. Exposure controls/personal protection

Control parameters

Occupational exposure limits None.

Appropriate engineering : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment. **controls**

Environmental exposure : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. **controls**

Individual protection measures

Hygiene measures	:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/ or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
Skin protection **Hand protection**	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear antistatic protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Dichlorosilane

9. Physical and chemical properties

Appearance	:	Gas. [Liquefied compressed gas.] Not
Physical state	:	available.
Color	:	101.01 g/mole
Molecular weight	:	Cl2-H2-Si
Molecular formula	:	8.25 °C (46.9°F)
Boiling/condensation point	:	-122.15 °C (-187.9°F)
Melting/freezing point	:	176 °C (348.8°F)
Critical temperature	:	Acidic irritating odor Not
Odor	:	available.
Odor threshold pH	:	Not available.
Flash point	:	Closed cup: -37.15°C (-34.9°F) Not
Burning time	:	applicable.
Burning rate	:	Not applicable.
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Lower and upper explosive (flammable) limits	:	Lower: 4.1% Upper: 99%
Vapor pressure	:	@ 70°F (21.1°C) = 22.5 psia (155 kPa)
Vapor density	:	3.5 (Air = 1)
Specific Volume (ft ^{3}/lb)	:	3.84
Gas Density (lb/ft ^{3})	:	Not available.
Relative density	:	Not applicable.
Solubility	:	Not available.
Solubility in water	:	Not available.
Partition coefficient: noctanol/water	:	Not available.
Auto-ignition temperature	:	57.77 °C (136°F) Not
Decomposition temperature	:	available.
SADT	:	Not available.
Viscosity	:	Not applicable.

10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Reacts violently with water.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas.

Incompatibility with various substances : Highly reactive or incompatible with the following materials: oxidizing materials and combustible materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Dichlorosilane	LC50 Inhalation Gas.	Rat	314 ppm	1 hours

Irritation/Corrosion Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity Not available.

Reproductive toxicity Not available.

Teratogenicity Not available.

Specific target organ toxicity (single exposure) Not available.

Specific target organ toxicity (repeated exposure) Not available.

Aspiration hazard Not available.

11. Toxicological information

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact	:	Causes serious eye damage.
Inhalation	:	Fatal if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
Skin contact	:	Causes severe burns.
Ingestion	:	May cause burns to mouth, throat and stomach. As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: Adverse symptoms may include the following: pain watering redness
Inhalation	: No specific data.
Skin contact	: Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	:	Not available.
Potential delayed effects	:	Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards. **Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates Not available.

12. Ecological information

Toxicity

Not available.

Persistence and degradability Not available.

Bioaccumulative potential Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

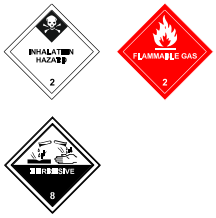
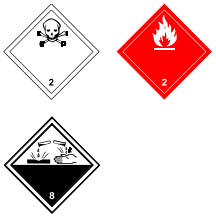
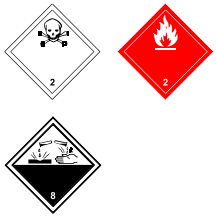
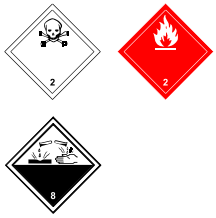
Other adverse effects : No known significant effects or critical hazards.

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed

13. Disposal considerations

of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate

14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN2189	UN2189	UN2189	UN2189	UN2189
UN proper shipping name	DICHLOROSILANE	DICHLOROSILANE	DICHLOROSILANE	DICHLOROSILANE	DICHLOROSILANE
Transport hazard class(es)	2.3 (2.1, 8) 	2.3 (2.1, 8) 	2.3 (2.1, 8) 	2.3 (2.1, 8) 	2.3 (2.1, 8) 
Packing group	-	-			
Environment	No.	No.	No.	No.	No.

Additional information	Inhalation hazard zone B **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: Forbidden. **Special provisions** 2, B9, B14	**Explosive Limit and Limited Quantity Index** 0 **ERAP Index** 25 **Passenger Carrying Ship Index** Forbidden **Passenger Carrying Road or Rail Index** Forbidden **Special provisions** 38	-	-	**Passenger and Cargo Aircraft**Quantity limitation: 0 Forbidden **Cargo Aircraft Only** Quantity limitation: 0 Forbidden

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user **: Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73 /78 and the IBC Code **:** Not available.

15. Regulatory information

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Dichlorosilane	100	Yes.	Yes.	No.	Yes.	No.

State regulations

Massachusetts **:** This material is not listed.
New York **:** This material is not listed.
New Jersey **:** This material is listed.
Pennsylvania **:** This material is listed.
Canada inventory **:** This material is listed or exempted.

Dichlorosilane

International regulations

International lists : **Australia inventory (AICS)**: This material is listed or exempted.
China inventory (IECSC): This material is listed or exempted.
Japan inventory: This material is listed or exempted.
Korea inventory: This material is listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): This material is listed or exempted.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

Canada

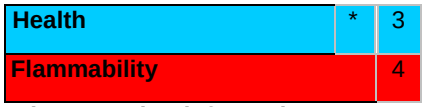
WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

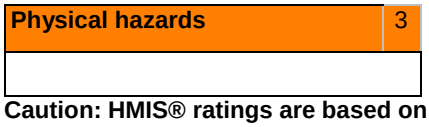
16. Other information

Canada Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).

Hazardous Material Information System (U.S.A.)



Section 16. Other information



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material. National Fire Protection Association (U.S.A.)

Dichlorosilane

Flammability

HealthInstability/Reactivity

Special

History

Date of printing : 5/18/2015.

Date of issue/Date of revision Date of previous issue Version : 5/18/2015.

: 10/20/2014.

: 0.02

Key to abbreviations

: ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United NationsACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
CAS – Chemical Abstract Services
CEPA – Canadian Environmental Protection Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
CFR – United States Code of Federal Regulations
CPR – Controlled Products Regulations
DSL – Domestic Substances List
GWP – Global Warming Potential
IARC – International Agency for Research on Cancer
ICAO – International Civil Aviation Organisation
Inh – Inhalation
LC – Lethal concentration
LD – Lethal dosage
NDSL – Non-Domestic Substances List
NIOSH – National Institute for Occupational Safety and Health
TDG – Canadian Transportation of Dangerous Goods Act and Regulations TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
WEEL – Workplace Environmental Exposure Level
WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.