

**TRICHLOROSILANE, 99.9+%**

Safety Data Sheet SIT8155.1

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Version: 2.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Product form	: Substance
Physical state	: Liquid
Substance name	: TRICHLOROSILANE, 99.9+%
Product code	: SIT8155.1
Formula	: Cl ₃ HSi
Synonyms	: SILICOCHLOROFORM HYDROTRICHLOROSILANE SILICON CHLORIDE HYDRIDE TRICHLOROMONOSILANE
Chemical family	: CHLOROSILANE

1.2. Relevant identified uses of the substance or mixture and uses advised against**1.2.1. Relevant identified uses**

Use of the substance/mixture : Chemical intermediate

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet**GELEST, INC.**11 East Steel Road
Morrisville, PA 19067**USA**

T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST

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info@gelestde.com - www.gelestde.com**1.4. Emergency telephone number**

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****Classification according to Regulation (EC) No. 1272/2008 [CLP]**

Flammable liquids, Category 1	H224
Pyrophoric Liquids, Category 1	H250
Acute toxicity (oral), Category 4	H302
Acute toxicity (inhal.), Category 4	H332
Skin corrosion/irritation, Category 1A	H314
Full text of H statements : see section 16	
Specific concentration limits: (1 =<C < 100)	STOT SE 3, H335

Adverse physicochemical, human health and environmental effects

No additional information available

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2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H224 - Extremely flammable liquid and vapour.
H250 - Catches fire spontaneously if exposed to air.
H302 - Harmful if swallowed.
H332 - Harmful if inhaled.
H314 - Causes severe skin burns and eye damage.

Precautionary statements (CLP)

: P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P210 - Keep away from heat, sparks, open flames. No smoking.
P222 - Do not allow contact with air.
P240 - Ground/bond container and receiving equipment.
P403+P235 - Keep in a cool place
P310 - Immediately call a POISON CENTER/doctor

EUH-statements

: EUH014 - Reacts violently with water.
EUH029 - Contact with water liberates toxic gas.

2.3. Other hazards

Other hazards not contributing to the classification

: NOTE: Material may form a siloxane polymer on the skin, eyes or in the lungs. Hydrogen chloride may be formed by reaction with water and moisture in air. The US OSHA PEL (TWA) for hydrogen chloride is 5 ppm.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent
Name : TRICHLOROSILANE, 99.9+%
CAS-No. : 10025-78-2
EC-No. : 233-042-5

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trichlorosilane	(CAS-No.) 10025-78-2 (EC-No.) 233-042-5;419-930-7 (EC Index-No.) 014-001-00-9	99.9 - 100	Flam. Liq. 1, H224 Pyr. Liq. 1, H250 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Corr. 1A, H314

Specific concentration limits:

Name	Product identifier	Specific concentration limits
Trichlorosilane	(CAS-No.) 10025-78-2 (EC-No.) 233-042-5;419-930-7 (EC Index-No.) 014-001-00-9	(1 =<C < 100) STOT SE 3, H335

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell.

First-aid measures after skin contact : Wash with plenty of water/.... Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

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First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects : Causes severe skin burns and eye damage. May cause damage to organs.
Symptoms/effects after inhalation : Harmful if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact : Causes (severe) skin burns.
Symptoms/effects after eye contact : Causes serious eye damage.
Symptoms/effects after ingestion : Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide. Dry chemical. Use of high expansion foam (100:1) is recommended to cover flames.
Unsuitable extinguishing media : Water.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Extremely flammable liquid and vapour. In contact with water releases flammable gases which may ignite spontaneously. Irritating fumes of hydrogen chloride and organic acid vapors may develop when material is exposed to water or open flame.
Explosion hazard : May form flammable/explosive vapour-air mixture.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Water spray or fog should only be used to knock down hydrogen chloride vapors in areas downwind from the fire. Use only dry media to extinguish flames.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.
Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures : Stop release.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapours are flammable. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not allow contact with water.
Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Do not allow contact with water. Handle under inert gas. Protect from moisture. Ground/bond container and receiving equipment. Open carefully. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

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Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place. Containers can generate pressure during storage. Store in sealed containers under dry inert atmosphere. Store locked up.

Incompatible materials : Acids. alcohols. Oxidizing agent. Moisture. Water.

Storage area : Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

TRICHLOROSILANE, 99.9+% (10025-78-2)		
Latvia	OEL TWA (mg/m ³)	1 mg/m ³
Lithuania	IPRV (mg/m ³)	1 mg/m ³
Trichlorosilane (10025-78-2)		
Latvia	OEL TWA (mg/m ³)	1 mg/m ³
Lithuania	IPRV (mg/m ³)	1 mg/m ³

8.2. Exposure controls

Appropriate engineering controls:

Provide local exhaust or general room ventilation.

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical goggles or face shield. (Viton recommended). Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

NIOSH-certified combination organic vapor/acid gas (yellow cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

Appearance : Clear liquid.

Molecular mass : 135.45 g/mol

Colour : Straw.

Odour : Acrid. Similar to hydrogen chloride.

Odour threshold : No data available

Refractive index : 1.402

pH : No data available

Relative evaporation rate (butylacetate=1) : 40

Melting point : No data available

Freezing point : -128 °C

Boiling point : 31.9 °C

Flash point : -13 °C

Critical temperature : 234 °C

Auto-ignition temperature : 215 °C

Decomposition temperature : No data available

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Flammability (solid, gas)	: Extremely flammable liquid and vapour, In contact with water releases flammable gases which may ignite spontaneously.
Vapour pressure	: 400 mm Hg @ 14.5°C; 2.5 mm Hg @ -70°C
Critical pressure	: 37 atm
Relative vapour density at 20 °C	: > 1
Relative density	: 1.3417
% Volatiles	: > 75 %
Solubility	: Reacts violently with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: 0.23 cSt @ 25°C
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 6.9 - 70 vol % (lower; upper)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable in sealed containers stored under a dry inert atmosphere.

10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating hydrogen chloride. Platinum, platinum and iron salts and other Lewis acids can cause generation of flammable hydrogen gas in the presence of moisture. Forms impact sensitive explosive mixtures with potassium permanganate.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

alcohols. Acids. Moisture. Oxidizing agent. Water.

10.6. Hazardous decomposition products

Hydrogen chloride. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if swallowed. Harmful if inhaled.

Trichlorosilane (10025-78-2)	
LD50 oral rat	1030 mg/kg
LC50 inhalation rat (ppm)	2767 ppm/1h
LC50 inhalation mouse (2 h)	1500 mg/m ³
ATE CLP (gases)	1383.5 ppmv/4h
ATE CLP (dust,mist)	1.5 mg/l/4h

Skin corrosion/irritation	: Causes severe skin burns and eye damage.
Serious eye damage/irritation	: Serious eye damage, category 1, implicit
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: Harmful if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact	: Causes (severe) skin burns.

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Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
Reason for classification	: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity	: Not classified
Chronic aquatic toxicity	: Not classified

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations	: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information	: Handle empty containers with care because residual vapours are flammable.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR)	: 1295
UN-No. (IMDG)	: 1295
UN-No. (IATA)	: 1295
UN-No. (ADN)	: 1295
UN-No. (RID)	: 1295

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: TRICHLOROSILANE
Proper Shipping Name (IMDG)	: TRICHLOROSILANE
Proper Shipping Name (IATA)	: Trichlorosilane
Proper Shipping Name (ADN)	: TRICHLOROSILANE
Proper Shipping Name (RID)	: TRICHLOROSILANE
Transport document description (ADR)	: UN 1295 TRICHLOROSILANE, 4.3 (3+8), I, (B/E)
Transport document description (IMDG)	: UN 1295 TRICHLOROSILANE, 4.3 (8+3), I (< -50°C c.c.)
Transport document description (IATA)	: UN 1295 Trichlorosilane, 4.3
Transport document description (ADN)	: UN 1295 TRICHLOROSILANE, 4.3 (3+8), I
Transport document description (RID)	: UN 1295 TRICHLOROSILANE, 4.3 (3+8), I

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR)	: 4.3 (3, 8)
Danger labels (ADR)	: 4.3, 3, 8

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IMDG

Transport hazard class(es) (IMDG)

: 4.3 (8, 3)

Danger labels (IMDG)

: 4.3, 8, 3



IATA

Transport hazard class(es) (IATA)

: 4.3

ADN

Transport hazard class(es) (ADN)

: 4.3 (3, 8)

Danger labels (ADN)

: 4.3, 3, 8



RID

Transport hazard class(es) (RID)

: 4.3 (3, 8)

Danger labels (RID)

: 4.3, 3, 8



14.4. Packing group

Packing group (ADR)

: I

Packing group (IMDG)

: I

Packing group (IATA)

: Not applicable

Packing group (ADN)

: I

Packing group (RID)

: I

14.5. Environmental hazards

Dangerous for the environment

: No

Marine pollutant

: No

Other information

: No supplementary information available

14.6. Special precautions for user

- Overland transport

Classification code (ADR)

: WFC

Limited quantities (ADR)

: 0

Excepted quantities (ADR)

: E0

Vehicle for tank carriage

: FL

Transport category (ADR)

: 0

Hazard identification number (Kemler No.)

: X338

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Orange plates

:

X338

1295

Tunnel restriction code (ADR)

: B/E

EAC code

: 4WE

APP code

: A(fl)

- Transport by sea

Limited quantities (IMDG)

: 0

Excepted quantities (IMDG)

: E0

Packing instructions (IMDG)

: P401

Special packing provisions (IMDG)

: PP31

Tank instructions (IMDG)

: T14

Tank special provisions (IMDG)

: TP2, TP7, TP13

EmS-No. (Fire)

: F-G

EmS-No. (Spillage)

: S-O

Stowage category (IMDG)

: D

Flash point (IMDG)

: below -50°C

Properties and observations (IMDG)

: Colourless, very volatile, flammable and corrosive liquid. Flashpoint: below -50°C Explosive limits: 1.2% to 90.5% Boiling point: 32°C. Reacts with water or steam to produce heat, which may lead to self-ignition; toxic and corrosive fumes will be evolved. May react vigorously in contact with oxidizing substances. Causes burns to skin, eyes and mucous membranes.

- Air transport

PCA Limited quantities (IATA)

: Forbidden

PCA limited quantity max net quantity (IATA)

: Forbidden

PCA packing instructions (IATA)

: Forbidden

PCA max net quantity (IATA)

: Forbidden

CAO packing instructions (IATA)

: Forbidden

CAO max net quantity (IATA)

: Forbidden

ERG code (IATA)

: 4HW

- Inland waterway transport

Classification code (ADN)

: WFC

Limited quantities (ADN)

: 0

Excepted quantities (ADN)

: E0

Equipment required (ADN)

: PP, EP, EX, A

Ventilation (ADN)

: VE01

Provisions for handling and stowage of the cargo (ADN)

: HA08

Number of blue cones/lights (ADN)

: 1

- Rail transport

No data available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

TRICHLOROSILANE, 99.9+% is not on the REACH Candidate List

TRICHLOROSILANE, 99.9+% is not on the REACH Annex XIV List

TRICHLOROSILANE, 99.9+% is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

TRICHLOROSILANE, 99.9+% is not subject to Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC

% Volatiles

: > 75 %

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15.1.2. National regulations

Germany

Reference to AwSV : Water hazard class (WGK) 1, Slightly hazardous to water (Classification according to VwVwS, Annex 1 or 2; ID No. 557)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

Denmark

Class for fire hazard : Class I-1

Store unit : 1 liter

Classification remarks : F+ <Flam. Liq. 1; Pyr. Liq. 1>; Emergency management guidelines for the storage of flammable liquids must be followed

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Abbreviations and acronyms:

	Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor
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Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Flam. Liq. 1	Flammable liquids, Category 1
Pyr. Liq. 1	Pyrophoric Liquids, Category 1
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H224	Extremely flammable liquid and vapour.
H250	Catches fire spontaneously if exposed to air.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
EUH014	Reacts violently with water.
EUH029	Contact with water liberates toxic gas.

SDS EU (REACH Annex II) - Custom

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