

TRIETHOXYCHLOROSILANE, tech-95

Safety Data Sheet SIT8178.0

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

Product form	: Substance
Physical state	: Liquid
Substance name	: TRIETHOXYCHLOROSILANE, tech-95
Product code	: SIT8178.0
Formula	: C6H15ClO3Si
Synonyms	: SILICON CHLORIDE TRIETHOXIDE; RIETHOXSILYLCHLORIDE; CHLOROTRIETHOXSILANE
Chemical family	: SILICATE ESTER

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**

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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 3	H226
Skin corrosion/irritation, Category 1B	H314
Serious eye damage/eye irritation, Category 1	H318
Full text of H statements : see section 16	

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements**Labelling according to Regulation (EC) No. 1272/2008 [CLP]**

Hazard pictograms (CLP) :



GHS02

GHS05

Signal word (CLP) : Danger

Hazard statements (CLP) : H226 - Flammable liquid and vapour.
H314 - Causes severe skin burns and eye damage.

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Precautionary statements (CLP) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground/bond container and receiving equipment.
P264 - Wash hands thoroughly after handling.
P403+P235 - Keep in a cool place
P310 - Immediately call a POISON CENTER or doctor/physician

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Multi-constituent
Name : TRIETHOXYCHLOROSILANE, tech-95
CAS-No. : 4667-99-6
EC-No. : 225-112-9

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Triethoxychlorosilane	(CAS-No.) 4667-99-6 (EC-No.) 225-112-9	> 90	Flam. Liq. 3, H226 Skin Corr. 1B, H314 Eye Dam. 1, H318
Ethyl silicate	(CAS-No.) 78-10-4 (EC-No.) 201-083-8 (EC Index-No.) 014-005-00-0	> 5	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2, H319 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.
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.
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

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

Symptoms/effects : Causes severe skin burns and eye damage.
Symptoms/effects after inhalation : May cause irritation to the respiratory tract. Overexposure may cause: Cough. Headache. Nausea.
Symptoms/effects after skin contact : Causes (severe) skin burns.
Symptoms/effects after eye contact : Causes serious eye damage.
Symptoms/effects after ingestion : May be harmful if swallowed.

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 : Water spray. Water fog. Foam. Carbon dioxide. Dry chemical.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapour. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

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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 : Remove ignition sources. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

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

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. 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.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Provide good ventilation in process area to prevent formation of vapour. Containers must be properly grounded before beginning transfer. Take precautionary measures against static discharge. Use only non-sparking tools.

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

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Store cold.

Incompatible materials : Oxidizing agent.

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

Ethyl silicate (78-10-4)		
Austria	MAK (mg/m ³)	170 mg/m ³
Austria	MAK (ppm)	20 ppm
Austria	MAK Short time value (mg/m ³)	340 mg/m ³
Austria	MAK Short time value (ppm)	40 ppm
Belgium	Limit value (mg/m ³)	86 mg/m ³
Belgium	Limit value (ppm)	10 ppm
Bulgaria	OEL TWA (mg/m ³)	100 mg/m ³
France	VME (mg/m ³)	85 mg/m ³
France	VME (ppm)	10 ppm
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	12 mg/m ³
Germany	TRGS 900 Occupational exposure limit value (ppm)	1.4 ppm
Greece	OEL TWA (mg/m ³)	170 mg/m ³
Greece	OEL TWA (ppm)	20 ppm
Greece	OEL STEL (mg/m ³)	255 mg/m ³
Greece	OEL STEL (ppm)	30 ppm
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	10 ppm
USA IDLH	US IDLH (ppm)	700 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	85 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	10 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	850 mg/m ³

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Ethyl silicate (78-10-4)		
USA OSHA	OSHA PEL (TWA) (ppm)	100 ppm
Spain	VLA-ED (mg/m ³)	87 mg/m ³
Spain	VLA-ED (ppm)	10 ppm
Switzerland	KZGW (mg/m ³)	85 mg/m ³
Switzerland	KZGW (ppm)	10 ppm
Switzerland	MAK (mg/m ³)	85 mg/m ³
Switzerland	MAK (ppm)	10 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	50 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	85 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	10 ppm
Finland	HTP-arvo (8h) (mg/m ³)	86 mg/m ³
Finland	HTP-arvo (8h) (ppm)	10 ppm
Finland	HTP-arvo (15 min)	170 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	20 ppm
Ireland	OEL (8 hours ref) (mg/m ³)	85 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	10 ppm
Ireland	OEL (15 min ref) (mg/m ³)	255 mg/m ³
Ireland	OEL (15 min ref) (ppm)	30 ppm
Norway	Grænseværdier (AN) (mg/m ³)	85 mg/m ³
Norway	Grænseværdier (AN) (ppm)	10 ppm
Norway	Grænseværdier (Korttidsverdi) (mg/m ³)	85 mg/m ³
Norway	Grænseværdier (Korttidsverdi) (ppm)	10 ppm
Poland	NDS (mg/m ³)	80 mg/m ³
Romania	OEL TWA (mg/m ³)	100 mg/m ³
Romania	OEL STEL (mg/m ³)	200 mg/m ³
Canada (Quebec)	VEMP (mg/m ³)	85 mg/m ³
Canada (Quebec)	VEMP (ppm)	10 ppm
Australia	TWA (mg/m ³)	85 mg/m ³
Australia	TWA (ppm)	10 ppm
Portugal	OEL TWA (ppm)	10 ppm

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. 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	: 198.72 g/mol

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Colour	: No data available
Odour	: characteristic. Acrid. Similar to hydrogen chloride.
Odour threshold	: No data available
Refractive index	: 1.388
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: ~ 51 °C
Boiling point	: 156 - 157 °C
Flash point	: 47 °C
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Flammable liquid and vapour.
Vapour pressure	: 200 mm Hg @ 100°C
Relative vapour density at 20 °C	: > 1
Relative density	: 1.012
% Volatiles	: 100 %
Solubility	: Reacts with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

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.

10.3. Possibility of hazardous reactions

Material decomposes slowly in contact with moist air or with water liberating ethanol.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Acid vapors. Ethanol. Silicon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Ethyl silicate (78-10-4)

LD50 oral rat	6270 mg/kg
LDLo inhalation rat	1000 ppm/4h

Skin corrosion/irritation	: Causes severe skin burns and eye damage.
Serious eye damage/irritation	: Causes serious eye damage.
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified

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STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: May cause irritation to the respiratory tract. Overexposure may cause: Cough. Headache. Nausea.
Symptoms/effects after skin contact	: Causes (severe) skin burns.
Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: May be harmful if swallowed.
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

Product/Packaging disposal recommendations	: Incinerate. 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)	: 2986
UN-No. (IMDG)	: 2986
UN-No. (IATA)	: 2986
UN-No. (ADN)	: 2986
UN-No. (RID)	: 2986

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.
Proper Shipping Name (IMDG)	: CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.
Proper Shipping Name (IATA)	: Chlorosilanes, corrosive, flammable, n.o.s.
Proper Shipping Name (ADN)	: CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.
Proper Shipping Name (RID)	: CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.
Transport document description (ADR)	: UN 2986 CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S. (TRIETHOXYCHLOROSILANE), 8 (3), II, (D/E)
Transport document description (IMDG)	: UN 2986 CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S. (TRIETHOXYCHLOROSILANE), 8 (3), II
Transport document description (IATA)	: UN 2986 Chlorosilanes, corrosive, flammable, n.o.s. (TRIETHOXYCHLOROSILANE), 8 (3), II
Transport document description (ADN)	: UN 2986 CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S. (TRIETHOXYCHLOROSILANE), 8 (3), II
Transport document description (RID)	: UN 2986 CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S. (TRIETHOXYCHLOROSILANE), 8 (3), II

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14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 8 (3)

Danger labels (ADR) : 8, 3



IMDG

Transport hazard class(es) (IMDG) : 8 (3)

Danger labels (IMDG) : 8, 3



IATA

Transport hazard class(es) (IATA) : 8 (3)

Hazard labels (IATA) : 8, 3



ADN

Transport hazard class(es) (ADN) : 8 (3)

Danger labels (ADN) : 8, 3



RID

Transport hazard class(es) (RID) : 8 (3)

Danger labels (RID) : 8, 3



14.4. Packing group

Packing group (ADR) : II

Packing group (IMDG) : II

Packing group (IATA) : II

Packing group (ADN) : II

Packing group (RID) : II

14.5. Environmental hazards

Dangerous for the environment : No

Marine pollutant : No

Other information : No supplementary information available

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14.6. Special precautions for user

- Overland transport

Classification code (ADR)	: CF1
Special provisions (ADR)	: 548
Limited quantities (ADR)	: 0
Excepted quantities (ADR)	: E0
Packing instructions (ADR)	: P010
Mixed packing provisions (ADR)	: MP15
Portable tank and bulk container instructions (ADR)	: T14
Portable tank and bulk container special provisions (ADR)	: TP2, TP7, TP27
Tank code (ADR)	: L4BN
Vehicle for tank carriage	: FL
Transport category (ADR)	: 2
Special provisions for carriage - Operation (ADR)	: S2
Hazard identification number (Kemler No.)	: X83
Orange plates	:

X83

2986

Tunnel restriction code (ADR)	: D/E
EAC code	: 4W
APP code	: A(fl)

- Transport by sea

Limited quantities (IMDG)	: 0
Excepted quantities (IMDG)	: E0
Packing instructions (IMDG)	: P010
Tank instructions (IMDG)	: T14
Tank special provisions (IMDG)	: TP2, TP7, TP13, TP27
EmS-No. (Fire)	: F-E
EmS-No. (Spillage)	: S-C
Stowage category (IMDG)	: C
Stowage and handling (IMDG)	: SW2
Properties and observations (IMDG)	: Colourless, flammable liquids with a pungent odour. Immiscible with water. React violently with water or steam, evolving hydrogen chloride, an irritating and corrosive gas apparent as white fumes. When involved in a fire, evolve toxic gas. In the presence of moisture, highly corrosive to most metals. Cause burns to skin, eyes and mucous membranes.

- Air transport

PCA Excepted quantities (IATA)	: E0
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)	: 876
CAO max net quantity (IATA)	: 30L
Special provisions (IATA)	: A1
ERG code (IATA)	: 8F

- Inland waterway transport

Classification code (ADN)	: CF1
Special provisions (ADN)	: 548
Limited quantities (ADN)	: 0
Excepted quantities (ADN)	: E0
Equipment required (ADN)	: PP, EP, EX, A
Ventilation (ADN)	: VE01
Number of blue cones/lights (ADN)	: 1

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- Rail transport

Classification code (RID)	: CF1
Special provisions (RID)	: 548
Limited quantities (RID)	: 0
Excepted quantities (RID)	: E0
Packing instructions (RID)	: P010
Mixed packing provisions (RID)	: MP15
Portable tank and bulk container instructions (RID)	: T14
Portable tank and bulk container special provisions (RID)	: TP2, TP7, TP27
Tank codes for RID tanks (RID)	: L4BN
Transport category (RID)	: 2
Colis express (express parcels) (RID)	: CE6
Hazard identification number (RID)	: X83

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

TRIETHOXYCHLOROSILANE, tech-95 is not on the REACH Candidate List

TRIETHOXYCHLOROSILANE, tech-95 is not on the REACH Annex XIV List

TRIETHOXYCHLOROSILANE, tech-95 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.

TRIETHOXYCHLOROSILANE, tech-95 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 : 100 %

15.1.2. National regulations

Germany

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 II-1

Store unit : 5 liter

Classification remarks : R10 <H226;H314>; 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:

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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

Other information

: Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H226	Flammable liquid and vapour.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.

SDS EU (REACH Annex II) - Custom

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