SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form
Physical state
Substance name
Product code
Formula
Synonyms
Chemical family
Substance
Liquid
TETRAETHOXYSILANE, 98%
SIT7110.0
C8H20O4Si
TETRAETHYLOORTHOSILICATE; TEOS; SILICON TETRAETHOXIDE; TETRAETHYL SILICATE; ETHYL SILICATE
ORGANOETHOXYSILANE

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
info@gelest.com - www.gelest.com

GELEST INC.
Fritz-Klatte-Strasse 8
65933 Frankfurt
Germany
T +49 (0) 69 3535106 - F +49 (0) 69 3535106-501 - (M-F): 8:00 AM - 4:00 PM
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
Acute toxicity (inhalation: vapour) Category 4
Serious eye damage/eye irritation, Category 2
Specific target organ toxicity — Single exposure, Category 3
Respiratory tract irritation

H226
H332
H319
H335

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)

GHS07
GHS02

Signal word (CLP)

Warning
TETRAETHOXYSILANE, 98%
Safety Data Sheet


2.3. Other hazards
Other hazards not contributing to the classification: Additional ethanol may be formed by reaction with moisture and water. The hydrolysis product of this compound is ethanol. Overexposure to ethanol by skin absorption, inhalation or ingestion may have a narcotic effect (headache, nausea, drowsiness). Ethanol is metabolized to acetaldehyde and acetic acid which in large quantities result in metabolic acidosis, CNS depression and death due to respiratory arrest. The US OSHA PEL (TWA) for ethanol is 1000 ppm. This product contains ethanol which is classified as a carcinogen by IARC in alcoholic beverages.

SECTION 3: Composition/information on ingredients

3.1. Substances
Substance type: Mono-constituent
Name: TETRAETHOXYSILANE, 98%
CAS-No.: 78-10-4
EC-No.: 201-083-8
EC Index-No.: 014-005-00-0

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl silicate</td>
<td>(CAS-No.) 78-10-4</td>
<td>95 –</td>
<td>Flam. Liq. 3, H226, Acute Tox. 4 (Inhalation), H332, Eye Irrit. 2, H319, STOT SE 3, H335</td>
</tr>
<tr>
<td></td>
<td>(EC-No.) 201-083-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(EC Index-No.) 014-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>005-00-0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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. If exposed or concerned: Get medical advice/attention.

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Wash with plenty of water/…. Get 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 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 after inhalation: May cause respiratory irritation. May be harmful if inhaled.
Symptoms/effects after skin contact: May cause skin irritation.
Symptoms/effects after eye contact: Causes serious eye irritation.
Symptoms/effects after ingestion: May be harmful if swallowed.
Chronic symptoms: On contact with water this compound liberates methanol which is known to have a chronic effect on the central nervous system.

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available.
SECTION 5: Firefighting measures

5.1. Extinguishing media


Unsuitable extinguishing media: Do not use straight streams.

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.

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

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".

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. 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. Ground/bond container and receiving equipment. 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: 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. Store locked up.


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

<table>
<thead>
<tr>
<th>Country</th>
<th>MAK [mg/m³]</th>
<th>MAK [ppm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>170 mg/m³</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Austria</td>
<td>340 mg/m³</td>
<td>40 ppm</td>
</tr>
<tr>
<td>Belgium</td>
<td>86 mg/m³</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

Print date: 07/10/2020   EN (English)   SDS ID: SIT7110.0
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. Contact lenses should not be worn

**Skin and body protection:**
Wear suitable protective clothing

**Respiratory protection:**
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>208.33 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.3818</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butylacetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>&lt; -85 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>169 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>46 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>260 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>200 mm Hg @ 108°C</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>7.2</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.9335</td>
</tr>
<tr>
<td>% Volatiles</td>
<td>100 %</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts with water. Solubility parameter: 7.87.</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water (Log Pow)</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water (Log Kow)</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>0.8 cSt</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>1.33 – 9.75 vol % (lower; upper)</td>
</tr>
</tbody>
</table>

#### 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

**TETRAETHOXYSILANE, 98%**

**Safety Data Sheet**

10.6. **Hazardous decomposition products**


**SECTION 11: Toxicological information**

11.1. **Information on toxicological effects**

**Acute toxicity:** Harmful if inhaled.

<table>
<thead>
<tr>
<th><strong>TETRAETHOXYSILANE, 98% (78-10-4)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>9280 mg/kg</td>
</tr>
<tr>
<td>ATE CLP (oral)</td>
<td>9280 mg/kg bodyweight</td>
</tr>
<tr>
<td>ATE CLP (vapours)</td>
<td>11 mg/l/4h</td>
</tr>
</tbody>
</table>

**Ethyl silicate (78-10-4)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>6270 mg/kg</td>
</tr>
<tr>
<td>LDLo inhalation rat</td>
<td>1000 ppm/4h</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation:** Not classified

**Serious eye damage/irritation:** Causes serious eye irritation.

Eye Irritation: eye-hmn, 3000 ppm: severe Irritant

**Respiratory or skin sensitisation:** Not classified

**Germ cell mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive toxicity:** Not classified

**STOT-single exposure:** May cause respiratory irritation.

**STOT-repeated exposure:** Not classified

**Aspiration hazard:** Not classified

**Symptoms/effects after inhalation:** May cause respiratory irritation. May be harmful if inhaled.

**Symptoms/effects after skin contact:** May cause skin irritation.

**Symptoms/effects after eye contact:** Causes serious eye irritation.

**Symptoms/effects after ingestion:** May be harmful if swallowed.

**Chronic symptoms:** On contact with water this compound liberates methanol which is known to have a chronic effect on the central nervous system.

**Reason for classification:** Expert judgment

**SECTION 12: Ecological information**

12.1. **Toxicity**

**Hazardous to the aquatic environment, short-term (acute):** Not classified

**Hazardous to the aquatic environment, long-term (chronic):** 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:** 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

| UN-No. (ADR) | 1292 |
| UN-No. (IMDG) | 1292 |
| UN-No. (IATA) | 1292 |
| UN-No. (ADN) | 1292 |
| UN-No. (RID) | 1292 |

## 14.2. UN proper shipping name

| Transport document description (ADR) | UN 1292 TETRAETHYL SILICATE, 3, III, (D/E) |
| Transport document description (IMDG) | UN 1292 TETRAETHYL SILICATE, 3, III (37°C c.c.) |
| Transport document description (IATA) | UN 1292 Tetraethyl silicate, 3, III |
| Transport document description (ADN) | UN 1292 TETRAETHYL SILICATE, 3, III |

## 14.3. Transport hazard class(es)

### ADR

Transport hazard class(es) (ADR) : 3
Danger labels (ADR) : 3

### IMDG

Transport hazard class(es) (IMDG) : 3
Danger labels (IMDG) : 3

### IATA

Transport hazard class(es) (IATA) : 3
Danger labels (IATA) : 3

### ADN

Transport hazard class(es) (ADN) : 3
Danger labels (ADN) : 3
TETRAETHOXY SILANE, 98%
Safety Data Sheet

RID
Transport hazard class(es) (RID) : 3
Danger labels (RID) : 3

14.4. Packing group
Packing group (ADR) : III
Packing group (IMDG) : III
Packing group (IATA) : III
Packing group (ADN) : III
Packing group (RID) : III

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) : F1
Limited quantities (ADR) : 5l
Excepted quantities (ADR) : E1
Packing instructions (ADR) : P001, IBC03, LP01, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T2
Portable tank and bulk container special provisions (ADR) : TP1
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 3
Special provisions for carriage - Packages (ADR) : V12
Special provisions for carriage - Operation (ADR) : S2
Hazard identification number (Kemler No.) : 30
Orange plates : 30
Tunnel restriction code (ADR) : D/E
EAC code : 3Y

- Transport by sea
Limited quantities (IMDG) : 5 L
Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P001, LP01
IBC packing instructions (IMDG) : IBC03
Tank instructions (IMDG) : T2
Tank special provisions (IMDG) : TP1
TETRAETHOXYSILANE, 98%
Safety Data Sheet

EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : A
Flash point (IMDG) : 37°C c.c.
Properties and observations (IMDG) : Colourless liquid. Flashpoint: 37°C c.c. Explosive limits: 1.3% to 23% Immiscible with water.

- Air transport
PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y344
PCA limited quantity max net quantity (IATA) : 10L
PCA packing instructions (IATA) : 355
PCA max net quantity (IATA) : 60L
CAO packing instructions (IATA) : 366
CAO max net quantity (IATA) : 220L
ERG code (IATA) : 3L

- Inland waterway transport
Classification code (ADN) : F1
Limited quantities (ADN) : 5 L
Excepted quantities (ADN) : E1
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 0

- Rail transport
Classification code (RID) : F1
Limited quantities (RID) : 5L
Excepted quantities (RID) : E1
Packing instructions (RID) : P001, IBC03, LP01, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T2
Portable tank and bulk container special provisions (RID) : TP1
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 3
Special provisions for carriage – Packages (RID) : W12
Colis express (express parcels) (RID) : CE4
Hazard identification number (RID) : 30

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
TETRAETHOXYSILANE, 98% is not on the REACH Candidate List
TETRAETHOXYSILANE, 98% is not on the REACH Annex XIV List

% Volatiles : 100 %

15.1.2. National regulations

Germany
## Regualtory reference
- WGK 1, Slightly hazardous to water (Classification according to VwVwS, Annex 1 or 2; ID No. 450)

## Hazardous Incident Ordinance (12. BlmSchV)
- Is not subject of the 12. BlmSchV (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;H319;H332;H335>; Emergency management guidelines for the storage of flammable liquids must be followed

###荷兰
- 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

### 荷兰
- 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

### 丹麦
- Class for fire hazard: Class II-1
- Store unit: 5 liter
- Classification remarks: R10 <H226;H319;H332;H335>; Emergency management guidelines for the storage of flammable liquids must be followed

### 15.2. Chemical safety assessment
- No additional information available

### SECTION 16: Other information

**Abbreviations and acronyms:**
- 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:

<table>
<thead>
<tr>
<th>Acute Tox. 4 (Inhalation)</th>
<th>Acute toxicity (inhal.), Category 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox. 4 (Inhalation:vapour)</td>
<td>Acute toxicity (inhalation:vapour) Category 4</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>Serious eye damage/eye irritation, Category 2</td>
</tr>
<tr>
<td>Flam. Liq. 3</td>
<td>Flammable liquids, Category 3</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation</td>
</tr>
<tr>
<td>H226</td>
<td>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H332</td>
<td>Harmful if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
</tbody>
</table>

**SDS EU (REACH Annex II) - Custom**

The information contained in this document has been gathered from reference materials and/or Gelest, Inc. test data and is to the best knowledge and belief of Gelest, Inc. accurate and reliable. Such information is offered solely for your consideration, investigation and verification. It is not suggested or guaranteed that the hazard precautions or procedures described are the only ones which exist. Gelest, Inc. makes no warranties, express or implied, with respect to the use of such information and assumes no responsibility therefore. Information on this safety data sheet is not intended to constitute a basis for product specifications.

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