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

1.1. Product identifier
- Product form: Substance
- Physical state: Liquid
- Substance name: TRISILYLAMINE
- Product code: SIT8715.8
- Formula: H9NSi3
- Synonyms: SILANAMINE, N,N-DISILYL-; SILANE, NITRILOTRIS-; DISILAZANE, 2-SILYL-
- Chemical family: HYDRIDOSILANE

1.2. Relevant identified uses of the substance or mixture and uses advised against
- Use of the substance/mixture: Chemical intermediate
  For research and industrial use only

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

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
GHS-US classification
- Flam. Liq. 2 H225
- Water-react. 1 H260
- Acute Tox. 2 (Inhalation: vapour) H330
- Skin Corr. 1B H314
- Eye Dam. 1 H318
- STOT SE 3. H335

Full text of H statements: see section 16

2.2. Label elements
GHS-US labeling
- Hazard pictograms (GHS-US):
  - GHS02
  - GHS05
  - GHS06
  - GHS07

- Signal word (GHS-US): Danger
- Hazard statements (GHS-US):
  - H225 - Highly flammable liquid and vapor
  - H260 - In contact with water releases flammable gases which may ignite spontaneously
  - H314 - Causes severe skin burns and eye damage
  - H330 - Fatal if inhaled
  - H335 - May cause respiratory irritation

- Precautionary statements (GHS-US):
  - P280 - Wear protective gloves/protective clothing/eye protection/face protection
  - P310 - Immediately call a doctor
  - P210 - Keep away from heat, open flames, sparks. - No smoking
  - P223 - Do not allow contact with water
  - P231+P232 - Handle under inert gas. Protect from moisture
  - P240 - Ground/bond container and receiving equipment
  - P241 - Use explosion-proof electrical equipment
  - P242 - Use only non-sparking tools
  - P243 - Take precautionary measures against static discharge
  - P260 - Do not breathe vapors
  - P264 - Wash hands thoroughly after handling
  - P271 - Use only outdoors or in a well-ventilated area
  - P284 - In case of inadequate ventilation wear respiratory protection
TRISILYLAMINE
Safety Data Sheet

P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a doctor if you feel unwell
P320 - Specific treatment is urgent (see first aid instructions on this label)
P321 - Specific treatment (see first aid instructions on this label)
P335+P334 - Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages
P363 - Wash contaminated clothing before reuse
P402+P404 - Store in a dry place. Store in a closed container
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P403+P235 - Keep in a cool place
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste disposal facility

2.3. Other hazards
Other hazards not contributing to the classification: This compound reacts with moisture in living tissue to generate ammonia. The US ACGIH (TWA) for ammonia is 25 ppm.

2.4. Unknown acute toxicity (GHS US)
No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance
Substance type: Mono-constituent
Name: TRISILYLAMINE
CAS No: 13862-16-3

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trisilylamine</td>
<td>(CAS No) 13862-16-3</td>
<td>95-100</td>
<td>Flam. Liq. 2, H225, Water-react. 1, H260, Acute Tox. 2 (Inhalation), H330, Skin Corr. 1B, H314, Eye Dam. 1, H318, STOT SE 3, H335</td>
</tr>
</tbody>
</table>

3.2. Mixture
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 no available show packaging or label.
First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
First-aid measures after skin contact: Wash with plenty of soap and 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/injuries: Causes severe skin burns and eye damage.
Symptoms/injuries after inhalation: Fatal if inhaled. May cause respiratory irritation.
Symptoms/injuries after skin contact: Causes (severe) skin burns.
Symptoms/injuries after eye contact: Causes serious eye damage.
Symptoms/injuries 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
Unsuitable extinguishing media: Water.
## 5.2. Special hazards arising from the substance or mixture

**Fire hazard**: Highly flammable liquid and vapor. In contact with water releases flammable gases which may ignite spontaneously. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame. Liquid generates strong static charge when poured.

**Explosion hazard**: May form flammable/explosive vapor-air mixture.

## 5.3. Advice for firefighters

**Firefighting instructions**: Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.

**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 vapor 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".

**Environmental precautions**: Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

**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 vapors are flammable. Keep away from any possible contact with water, because of violent reaction and possible flash fire. This compound is known to have an exceptional tendency to accumulate static charge. The user must take extreme care to dissipate static charge by grounding of all equipment involved in liquid transfer.

**Precautions for safe handling**: Avoid all eye and skin contact and do not breathe vapor and mist. Do not allow contact with water. Ground/bond container and receiving equipment. Handle under inert gas. Protect from moisture. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

**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. Store locked up. Store in a dry place. Store in a closed container.


**Storage area**: Store in a cool 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

No additional information available

### 8.2. Exposure controls

**Appropriate engineering controls**: Handle in an enclosing hood with exhaust ventilation.
**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>107.33 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-106 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>52 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>-48 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>&gt; 101 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Highly flammable liquid and vapor, in contact with water releases flammable gases which may ignite spontaneously</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>109 mm Hg @ 0 °C</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>4.46</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.895</td>
</tr>
<tr>
<td>VOC content</td>
<td>100 %</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in water. Reacts violently with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</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>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</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 in sealed containers in a cool place.

10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating ammonia. In the presence of strong alkalies will generate flammable hydrogen gas.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials


10.6. Hazardous decomposition products

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute toxicity

**TRISILYLAMINE (13862-16-3)**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (vapors)</td>
<td>0.500 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>439 ppm/1h</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>219.500 ppmV/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.050 mg/l/4h</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**

- Causes severe skin burns and eye damage.

**Serious eye damage/irritation**

- Causes serious eye damage.

**Respiratory or skin sensitization**

- Not classified

**Germ cell mutagenicity**

- Not classified

**Carcinogenicity**

- Not classified

**Reproductive toxicity**

- Not classified

**Specific target organ toxicity (single exposure)**

- May cause respiratory irritation.

**Specific target organ toxicity (repeated exposure)**

- Not classified

**Aspiration hazard**

- Not classified

**Symptoms/injuries after inhalation**

- Fatal if inhaled. May cause respiratory irritation.

**Symptoms/injuries after skin contact**

- Causes (severe) skin burns.

**Symptoms/injuries after eye contact**

- Causes serious eye damage.

**Symptoms/injuries after ingestion**

- May be harmful if swallowed.

**Reason for classification**

- Expert judgment

## SECTION 12: Ecological information

### 12.1. Toxicity

- No additional information available

### 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. Other adverse effects

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

- Effect on ozone layer: No additional information available

- Effect on the global warming: No known ecological damage caused by this product.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

**Sewage disposal recommendations**

- Do not dispose of waste into sewer.

**Waste disposal recommendations**

- May be incinerated. Dispose in a safe manner in accordance with local/national regulations.

**Additional information**

- Dispose of contents/container to licensed waste disposal facility

**Ecology - waste materials**

- Handle empty containers with care because residual vapors are flammable.

- Avoid release to the environment.

## SECTION 14: Transport information

### 14.1. UN number

- UN-No. (DOT): 3491
- DOT NA no.: UN3491

### 14.2. UN proper shipping name

- Proper Shipping Name (DOT): Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (TRISILYLAMINE)
### TRISILYLAMINE

#### Safety Data Sheet

**Hazard labels (DOT):**
- 6.1 - Poison
- 4.3 - Dangerous when wet
- 3 - Flammable liquid

**DOT Symbols:**
- G - Identifies PSN requiring a technical name

**Packing group (DOT):**
- I - Great Danger

**DOT Packaging Exceptions (49 CFR 173.xxx):**
- None

**DOT Packaging Non Bulk (49 CFR 173.xxx):**
- 227

**DOT Packaging Bulk (49 CFR 173.xxx):**
- 244

### 14.3 Additional information

**Emergency Response Guide (ERG) Number:**
- 155

**Other information:**
- IMDG: 6270-5 EmS no. 6.1-107 MFAG Table No. subsection: 4.2. TOXIC INHALATION HAZARD ZONE B AIR TRANSPORT IS FORBIDDEN.

**Transport by sea**

**DOT Vessel Stowage Location:**
- D - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded

**DOT Vessel Stowage Other:**
- 13 - Keep as dry as reasonably practicable
- 21 - Segregation same as for flammable liquids
- 28 - Stow “away from” flammable liquids
- 40 - Stow “clear of living quarters”
- 49 - Stow “away from” corrosives

**Air transport**

**DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27):**
- Forbidden

**DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75):**
- Forbidden

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

**TRISILYLAMINE (13862-16-3)**

- **TSCA Exemption/Exclusion**
  - Low Volume Exemption in accordance with 40 CFR 723.50(c)(1), This LVE limits site of manufacture of this substance to Gelest, Inc. unless otherwise approved by U.S. EPA

**Trisilylamine (13862-16-3)**

- Not listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 15.2. International regulations

**Trisilylamine (13862-16-3)**

- Listed on the Korean ECL (Existing Chemicals List)

#### 15.3. US State regulations

**TRISILYLAMINE (13862-16-3)**

<table>
<thead>
<tr>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
<td>No</td>
</tr>
</tbody>
</table>

**Trisilylamine (13862-16-3)**

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<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>Non-significant risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Non-significant risk level</td>
</tr>
</tbody>
</table>

02/24/2016  EN (English US)  SDS ID: SIT8715.8  6/7
## 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.

### Full text of H-phrases:

<table>
<thead>
<tr>
<th>H-Phrase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H225</td>
<td>Highly flammable liquid and vapor</td>
</tr>
<tr>
<td>H260</td>
<td>In contact with water releases flammable gases which may ignite spontaneously</td>
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<td>H314</td>
<td>Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
</tbody>
</table>

### HMIS III Rating

- **Health**: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures
- **Flammability**: 4 Severe Hazard
- **Physical**: 3 Serious Hazard

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Prepared by safety and environmental affairs.

**Date of issue:** 02/23/2016  
**Version:** 1.0

SDS US (GHS HazCom 2012) - Custom  
According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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