SECTION 1: Identification

1.1. Identification

Product name: (1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1- AZA-2-SILACYCLOPENTANE, tech-90
Product code: SIT8187.2
Product form: Substance
Physical state: Liquid
Formula: C16H37NO5Si2
Synonyms: 1-AZA-2-SILACYCLOPENTANE, 2,2-DIETHOXY-1-[3-(TRIETHOXYSILYL)PROPYL]-
Chemical family: ORGANOETHOXYSILANE

1.2. Recommended use and restrictions on use

Recommended use: Chemical intermediate

1.3. Supplier

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: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Skin corrosion/irritation Category 1C - H314 Causes severe skin burns and eye damage
Serious eye damage/eye irritation Category 1 - H318 Causes serious eye damage
Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling
Hazard pictograms (GHS US):

Signal word (GHS US): Danger
Hazard statements (GHS US): H314 - Causes severe skin burns and eye damage
Precautionary statements (GHS US):
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P260 - Do not breathe vapors.
P264 - Wash hands thoroughly after handling.
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
P310 - Immediately call a doctor
P321 - Specific treatment (see first aid instructions on this label)
P363 - Wash contaminated clothing before reuse.
P405 - Store locked up.
P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Hazards not otherwise classified (HNOC)

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.
(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-aza-2-silacyclopentane, tech-90
Safety Data Sheet

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance type</th>
<th>Name</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-constituent</td>
<td>(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-aza-2-silacyclopentane</td>
<td>1184179-50-7</td>
</tr>
<tr>
<td></td>
<td>Bis(3-triethoxysilylpropyl)amine</td>
<td>13497-18-2</td>
</tr>
</tbody>
</table>

Full text of hazard classes and 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 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 (acute and delayed)

Symptoms/effects: Causes skin burns and eye damage.
Symptoms/effects after inhalation: May cause irritation to the respiratory tract.
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.

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

4.3. Immediate medical attention and special treatment, if necessary

NOTE TO PHYSICIAN: This product reacts with water in the acid contents of the stomach to form ethanol.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>UNSuitable extinguishing media</th>
</tr>
</thead>
</table>

5.2. Specific hazards arising from the chemical

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

5.3. Special protective equipment and precautions for fire-fighters

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

6.1.1. For non-emergency personnel

<table>
<thead>
<tr>
<th>Protective equipment</th>
<th>Emergency procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear protective equipment as described in Section 8.</td>
<td>Evacuate unnecessary personnel.</td>
</tr>
</tbody>
</table>
(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE, tech-90

Safety Data Sheet

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.

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
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist. Provide good ventilation in process area to prevent accumulation of vapors.
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
Storage conditions: Keep container tightly closed. Store locked up.
Storage area: Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Appropriate engineering controls
Appropriate engineering controls: Provide local exhaust or general room ventilation.

8.3. Individual protection measures/Personal protective equipment
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:
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified combination organic vapor - amine gas (brown 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: 379.64 g/mol
Color: Straw.
Odor threshold: No data available
Refractive index: 1.4322
(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE, tech-90
Safety Data Sheet

pH : No data available
Relative evaporation rate (butyl acetate=1) : < 1
Melting point : No data available
Freezing point : < 0 °C
Boiling point : 136 - 138 °C @ 1 mm Hg
Flash point : > 110 °C
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapor pressure : < 0.1 mm Hg @ 100°C
Relative vapor density at 20 °C : > 1
Relative density : 0.974
% Volatiles : < 40 %
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
Oxidizing properties : No data available
Explosion 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 when stored in sealed containers.

10.3. Possibility of hazardous reactions
Reacts with water and moisture in air, liberating ethanol.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials

10.6. Hazardous decomposition products
Ethanol. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Not classified
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 : Not classified
Specific target organ toxicity – repeated exposure : Not classified
Aspiration hazard : Not classified
### Potential Adverse Human Health Effects and Symptoms

- **Symptoms/effects after inhalation**: May cause irritation to the respiratory tract.
- **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.
- **Chronic symptoms**: On contact with water this compound liberates ethanol which is known to have a chronic effect on the central nervous system.

### Reason for Classification
- **Reason for classification**: Expert judgment

### SECTION 12: Ecological Information

#### 12.1. Toxicity
- **Toxicity**: No additional information available

#### 12.2. Persistence and Degradability
- **Persistence and Degradability**: No additional information available

#### 12.3. Bioaccumulative Potential
- **Bioaccumulative Potential**: No additional information available

#### 12.4. Mobility in Soil
- **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 the ozone layer**: No additional information available

### SECTION 13: Disposal Considerations

#### 13.1. Disposal Methods
- **Sewage disposal recommendations**: Do not dispose of waste into sewer.
- **Product/Packaging disposal recommendations**: May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
- **Ecology - waste materials**: Avoid release to the environment.

### SECTION 14: Transport Information

#### 14.1. UN Number
- **UN-No. (DOT)**: 2735
- **DOT NA no.**: UN2735

#### 14.2. UN Proper Shipping Name
- **Transport document description**: Amines, liquid, corrosive, n.o.s. (1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE), 8, III
- **Proper Shipping Name (DOT)**: Amines, liquid, corrosive, n.o.s. (1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE)
- **Class (DOT)**: 8 - Class 8 - Corrosive material 49 CFR 173.136
- **Packing group (DOT)**: III - Minor Danger
- **Hazard labels (DOT)**: 8 - Corrosive

#### DOT Packaging Non Bulk (49 CFR 173.xxx)
- **DOT Packaging Non Bulk**: 203

#### DOT Packaging Bulk (49 CFR 173.xxx)
- **DOT Packaging Bulk**: 241

#### DOT Packaging Exceptions (49 CFR 173.xxx)
- **DOT Packaging Exceptions**: 154

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

#### 14.3. Additional Information
- **Emergency Response Guide (ERG) Number**: 153
- **Other information**: No supplementary information available.
(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE, tech-90
Safety Data Sheet

Transport by sea
DOT Vessel Stowage Location: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
DOT Vessel Stowage Other: 52 - Stow "separated from" acids

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 60 L

SECTION 15: Regulatory information
15.1. US Federal regulations

| (1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE, tech-90 (1184179-50-7) |
| TSCA Exemption/Exclusion | CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States. |

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

| Bis(3-triethoxysilyl)propylamine (13497-18-2) |
| Listed on the United States TSCA (Toxic Substances Control Act) inventory |

15.2. International regulations

CANADA
No additional information available

| Bis(3-triethoxysilyl)propylamine (13497-18-2) |
| Listed on the Canadian NDSL (Non-Domestic Substances List) |

EU-Regulations
No additional information available

| Bis(3-triethoxysilyl)propylamine (13497-18-2) |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |

National regulations

| Bis(3-triethoxysilyl)propylamine (13497-18-2) |
| Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) |
| Listed on the Japanese ISHL (Industrial Safety and Health Law) |
| Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) |

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Full text of H-phrases:

| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H335 | May cause respiratory irritation |

Print date: 04/11/2019 EN (English US) SDS ID: SIT8187.2
(1-(3-TRIETHOXYSILYL)PROPYL)-2,2-DIETHOXY-1-AZA-2-SILACYCLOPENTANE, tech-90
Safety Data Sheet

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.

Hazard Rating

Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability: 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)
Physical: 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Prepared by safety and environmental affairs.

Date of issue: 10/28/2015 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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