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

1.1. Product identifier

Product form: Substance
Physical state: Liquid
Substance name: 1,1,1,3,3,3-HEXAMETHYLDISILAZANE
Product code: SIH6110.0
Formula: C6H19NSi2
Synonyms: HMDS; HMDZ; BIS(TRIMETHYLSILYL)AMINE
Chemical family: ORGANOAMINOSILANE

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

Classification (GHS-US)
Flam. Liq. 2 H225
Acute Tox. 4 (Oral) H302
Acute Tox. 3 (Dermal) H311
Acute Tox. 3 (Inhalation/vapour) H311
Skin Corr. 1B H314
Eye Dam. 1 H318

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US):

Signal word (GHS-US): Danger
Hazard statements (GHS-US):
H225 - Highly flammable liquid and vapor
H302 - Harmful if swallowed
H311+H331 - Toxic in contact with skin or if inhaled
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage

Precautionary statements (GHS-US):
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P210 - Keep away from heat, open flames, sparks. - No smoking
P233 - Keep container tightly closed
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
P308+P311 - In case of fire: Use water spray, foam, carbon dioxide, dry chemical to extinguish
P260 - Do not breathe vapors
P270 - Do not eat, drink or smoke when using this product
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P301+P312 - If swallowed: Call a doctor if you feel unwell

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P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P264 - Wash hands thoroughly after handling
P361 - Take off immediately all contaminated clothing
P363 - Wash contaminated clothing before reuse
P271 - Use only outdoors or in a well-ventilated area
P403+P405 - Keep in a cool place
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste disposal facility.
P330 - Rinse mouth

2.3. Other hazards
Other hazards not contributing to the classification: Hexamethyl disilazane reacts with moisture in living tissue to generate ammonia.

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

SECTION 3: Composition/information on ingredients

3.1. Substance
Substance type: Mono-constituent
Name: 1,1,1,3,3,3-HEXAMETHYLDISILAZANE
CAS No: 999-97-3
EC no: 213-668-5

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexamethyl disilazane</td>
<td>(CAS No) 999-97-3</td>
<td>95-100</td>
<td>Flam. Liq. 2, H225, Acute Tox. 4 (Oral), H302, Acute Tox. 3 (Dermal), H311, Acute Tox. 3 (Inhalation: vapour), H331, Skin Corr. 1B, H314</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 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. Immediately call a poison center or doctor/physician.
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. Call a POISON CENTER or doctor/physician if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries: Causes severe skin burns and eye damage.
Symptoms/injuries after skin contact: Toxic in contact with skin. Repeated exposure to this material can result in absorption through skin causing significant health hazard. Causes (severe) skin burns.
Symptoms/injuries after eye contact: Causes serious eye damage.
Symptoms/injuries after ingestion: 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
1,1,1,3,3,3-HEXAMETHYLDISILAZANE
Safety Data Sheet

5.2. Special hazards arising from the substance or mixture

Fire hazard: Highly flammable liquid and vapor. 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: Use water spray to cool exposed surfaces. 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 vapor 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.

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: Hexamethyldisilazane is known to have an exceptional tendency to accumulate static charge. Human fatality has been reported from fires ignited by static discharge of hexamethyldisilazane. The user must take extreme care to dissipate static charge by grounding of all equipment involved in liquid transfer. Handle empty containers with care because residual vapors are flammable.

Precautions for safe handling: Containers must be properly grounded before beginning transfer. Take precautionary measures against static discharge. Provide good ventilation in process area to prevent accumulation of vapors. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Do not breathe vapors.

Hygiene measures: Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. 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. Ground/bond container and receiving equipment. Use explosion-proof electrical equipment. Comply with applicable regulations.

Storage conditions: Keep container tightly closed.


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

<table>
<thead>
<tr>
<th>Hexamethyldisilazane (999-97-3)</th>
<th>USA OSHA</th>
<th>OSHA PEL (TWA) (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>35 ppm (ammonia)</td>
</tr>
</tbody>
</table>

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.
### Section 9: 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>161.39 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</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>1.4080</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>~ 1</td>
</tr>
<tr>
<td>Melting point</td>
<td>&lt; -76 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>126 - 127 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>12 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>325 °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</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>50 mm Hg @ 50°C</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.7742</td>
</tr>
<tr>
<td>VOC content</td>
<td>100 %</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in water. Reacts 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>0.90 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>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>0.3 - 41 vol %</td>
</tr>
</tbody>
</table>

### 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.

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

#### 10.5 Incompatible materials

#### 10.6 Hazardous decomposition products
Ammonia. Organic acid vapors.

### Section 11: Toxicological information

#### 11.1 Information on toxicological effects
**Acute toxicity**

<table>
<thead>
<tr>
<th>1,1,1,3,3,3-HEXAMETHYLDISILAZANE (999-97-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
</tr>
<tr>
<td>ATE US (dermal)</td>
</tr>
</tbody>
</table>
1,1,1,3,3,3-HEXAMETHYLDISILAZANE
Safety Data Sheet

1,1,1,3,3,3-HEXAMETHYLDISILAZANE (999-97-3)
ATE US (vapors) 3.000 mg/l/4h

Hexamethyldisilazane (999-97-3)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>850 mg/kg</td>
</tr>
<tr>
<td>LD50 dermal rabbit</td>
<td>540 mg/kg</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l) (Exposure time: 4 h)</td>
<td>8.7 mg/l</td>
</tr>
<tr>
<td>LDLo intraperitoneal rat</td>
<td>650 mg/kg</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>847.000 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (dermal)</td>
<td>540.000 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>8.700 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>8.700 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: Bacterial reverse mutation test (Ames) is negative (non-mutagenic).

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:
- Toxic in contact with skin. Repeated exposure to this material can result in absorption through skin causing significant health hazard. Causes (severe) skin burns.
- Causes serious eye damage.
- Swallowing a small quantity of this material will result in serious health hazard.

SECTION 12: Ecological information

12.1. Toxicity

Hexamethyldisilazane (999-97-3)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1 (Exposure time: 96 h - Species: Pimephales promelas [static])</td>
<td>167 mg/l</td>
</tr>
<tr>
<td>EC50 Daphnia 1 (Exposure time: 48 h - Species: Daphnia magna)</td>
<td>186 mg/l</td>
</tr>
</tbody>
</table>

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

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

Waste 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 vapors are flammable.

Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

UN-No.(DOT) 3286
DOT NA no. UN3286
1,1,1,3,3,3-HEXAMETHYLDISILAZANE
Safety Data Sheet

14.2. UN proper shipping name

Proper Shipping Name (DOT) : FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
Department of Transportation (DOT) Hazard Classes : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Hazard labels (DOT) : 3 - Flammable liquid
             6.1 - Poison
             8 - Corrosive

DOT Symbols : G - Identifies PSN requiring a technical name
Packing group (DOT) : II - Medium Danger
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 243

14.3. Additional information

Other information : No supplementary information available.

Transport by sea

DOT Vessel Stowage Location : B - (i) The material may be stowed “on deck” or “under deck” 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; and (ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

DOT Vessel Stowage Other : 21 - Segregation same as for flammable liquids, 40 - Stow “clear of living quarters”, 100 - Stow “away from” flammable solids

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 5 L

SECTION 15: Regulatory information

15.1. US Federal regulations

Hexamethyldisilazane (999-97-3) Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

Hexamethyldisilazane (999-97-3) Listed on the AICS (Australian Inventory of Chemical Substances) Listed on the Canadian DSL (Domestic Substances List) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican national Inventory of Chemical Substances)

15.3. US State regulations

1,1,1,3,3,3-HEXAMETHYLDISILAZANE(999-97-3)

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

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1,1,1,3,3,3-HEXAMETHYLDISILAZANE
Safety Data Sheet

<table>
<thead>
<tr>
<th>Hexamethyldisilazane (999-97-3)</th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>No significance risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

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.

Full text of H-phrases:

- Acute Tox. 3 (Dermal): Acute toxicity (dermal) Category 3
- Acute Tox. 3 (Inhalation:vapour): Acute toxicity (inhalation:vapor) Category 3
- Acute Tox. 4 (Oral): Acute toxicity (oral) Category 4
- Eye Dam. 1: Serious eye damage/eye irritation Category 1
- Flam. Liq. 2: Flammable liquids Category 2
- Skin Corr. 1B: Skin corrosion/irritation Category 1B
- H225: Highly flammable liquid and vapor
- H302: Harmful if swallowed
- H311: Toxic in contact with skin
- H314: Causes severe skin burns and eye damage
- H318: Causes serious eye damage
- H331: Toxic if inhaled

HMIS III Rating

- Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
- Flammability: 4 Severe Hazard
- Physical: 1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 01/06/2015  Revision date: 08/28/2015  Version: 2.0

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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