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

<table>
<thead>
<tr>
<th>1.1. Product identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product form</strong></td>
</tr>
<tr>
<td><strong>Physical state</strong></td>
</tr>
<tr>
<td><strong>Substance name</strong></td>
</tr>
<tr>
<td><strong>Product code</strong></td>
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<tr>
<td><strong>Formula</strong></td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
</tr>
<tr>
<td><strong>Chemical family</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2. Relevant identified uses of the substance or mixture and uses advised against</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use of the substance/mixture</strong></td>
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</table>

<table>
<thead>
<tr>
<th>1.3. Details of the supplier of the safety data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GELEST, INC.</strong></td>
</tr>
<tr>
<td>11 East Steel Road</td>
</tr>
<tr>
<td>Morrisville, PA 19067</td>
</tr>
<tr>
<td><strong>USA</strong></td>
</tr>
<tr>
<td>T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST</td>
</tr>
<tr>
<td><a href="mailto:info@gelest.com">info@gelest.com</a> - <a href="http://www.gelest.com">www.gelest.com</a></td>
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</table>

<table>
<thead>
<tr>
<th>1.4. Emergency telephone number</th>
</tr>
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<tbody>
<tr>
<td><strong>Emergency number</strong></td>
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</table>

### SECTION 2: Hazards identification

<table>
<thead>
<tr>
<th>2.1. Classification of the substance or mixture</th>
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<tbody>
<tr>
<td><strong>GHS-US classification</strong></td>
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<tr>
<td>Flam. Liq. 3</td>
</tr>
<tr>
<td>Skin Corr. 1B</td>
</tr>
<tr>
<td>Eye Dam. 1</td>
</tr>
<tr>
<td>STOT SE 3</td>
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<tr>
<td><strong>Full text of H statements : see section 16</strong></td>
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</table>

<table>
<thead>
<tr>
<th>2.2. Label elements</th>
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<tbody>
<tr>
<td><strong>GHS-US labeling</strong></td>
</tr>
<tr>
<td>Hazard pictograms (GHS-US)</td>
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<td><img src="image" alt="GHS02" /></td>
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<tr>
<td><strong>Signal word (GHS-US)</strong></td>
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<tr>
<td><strong>Hazard statements (GHS-US)</strong></td>
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<tr>
<td><strong>Precautionary statements (GHS-US)</strong></td>
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</table>
TITANIUM TETRAKIS(DIETHYLAMIDE), 99+%  
Safety Data Sheet

P321 - Specific treatment (see first aid instructions on this label)  
P363 - Wash contaminated clothing before reuse  
P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide, dry chemical to extinguish  
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: Additional diethylamine may be formed by reaction with moisture and water. The US OSHA PEL (TWA) for diethylamine 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: TITANIUM TETRAKIS(DIETHYLAMIDE), 99+%  
CAS No: 4419-47-0

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
</table>
| Titanium tetrakis(diethylamide)                    | (CAS no) 4419-47-0 | 99 -100 | Flam. Liq. 3, H226  
|                                                    |                    |     | Skin Corr. 1B, H314       |
|                                                    |                    |     | Eye Dam. 1, H318           |
|                                                    |                    |     | STOT SE 3, H335            |

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. 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 after inhalation: 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: Do not use straight streams.

5.2. Special hazards arising from the substance or mixture
Fire hazard: Flammable liquid and vapor. Irritating fumes of diethylamine and organic acid vapors may develop when material is exposed to water or open flame.

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".

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 vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. 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.
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

No additional information available

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: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. 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: Liquid.
Molecular mass: 336.4 g/mol
Color: Orange-amber.
TITANIUM TETRAKIS(DIETHYLAMIDE), 99+%  
Safety Data Sheet

## Odor
- **Odor**: Acrid, Amine.
- **Odor threshold**: No data available

## Refractive index
- **Refractive index**: 1.536
- **pH**: No data available

## Melting point
- **Melting point**: No data available

## Freezing point
- **Freezing point**: < 0 °C

## Boiling point
- **Boiling point**: 133 °C @ 1.2 mm Hg

## Flash point
- **Flash point**: 37 °C

## Auto-ignition temperature
- **Auto-ignition temperature**: No data available

## Decomposition temperature
- **Decomposition temperature**: No data available

## Flammability (solid, gas)
- **Flammability (solid, gas)**: Flammable liquid and vapor

## Vapor pressure
- **Vapor pressure**: 0.035 mm Hg @ 40°C

## Relative vapor density at 20 °C
- **Relative vapor density at 20 °C**: > 1
- **Relative density**: 0.938

## Solubility
- **Solubility**: Reacts with water.

## Viscosity, kinematic
- **Viscosity, kinematic**: No data available

## Viscosity, dynamic
- **Viscosity, dynamic**: No data available

## Explosive properties
- **Explosive properties**: No data available

## Oxidizing properties
- **Oxidizing properties**: No data available

## Explosion limits
- **Explosion limits**: No data available

## 9.2. Other information
- **9.2. Other information**: No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity
- **10.1. Reactivity**: No additional information available

### 10.2. Chemical stability
- **10.2. Chemical stability**: Stable in sealed containers stored under a dry inert atmosphere.

### 10.3. Possibility of hazardous reactions
- **10.3. Possibility of hazardous reactions**: Reacts with water and moisture in air, liberating diethylamine.

### 10.4. Conditions to avoid
- **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
- **11.1. Information on toxicological effects**: Not classified

- **Acute toxicity**: 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**: May cause respiratory irritation.
- **Symptoms/injuries after skin contact**: Causes (severe) skin burns.
TITANIUM TETRAKIS(DIETHYLAMIDE), 99+%
Safety Data Sheet

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 effects from this product.

SECTION 13: Disposal considerations
13.1. Waste treatment methods
Sewage disposal recommendations: Do not dispose of waste into sewer.
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): 2920
DOT NA no.: UN2920

14.2. UN proper shipping name
Proper Shipping Name (DOT): Corrosive liquids, flammable, n.o.s.
(TITANIUM TETRAKIS(DIETHYLAMIDE))
Class (DOT): 8 - Class 8 - Corrosive material 49 CFR 173.136
Hazard labels (DOT): 8 - Corrosive
3 - Flammable liquid

DOT Symbols: G - Identifies PSN requiring a technical name
Packing group (DOT): II - Medium Danger
DOT Packaging Exceptions (49 CFR 173.xxx): None
DOT Packaging Non Bulk (49 CFR 173.xxx): 202
DOT Packaging Bulk (49 CFR 173.xxx): 243

14.3. Additional information
Emergency Response Guide (ERG) Number: 132
Other information: No supplementary information available.

Transport by sea
DOT Vessel Stowage Location: C - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel
DOT Vessel Stowage Other: 25 - Shade from radiant heat,40 - Stow “clear of living quarters”

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 1 L
TITANIUM TETRAKIS(DIETHYLAMIDE), 99+%  
Safety Data Sheet

DOT Quantity Limitations Cargo aircraft only (49 : 30 L  
CFR 175.75)

SECTION 15: Regulatory information

15.1. US Federal regulations

Titanium tetrakis(diethylamide) (4419-47-0)  
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

Titanium tetrakis(diethylamide) (4419-47-0)  
Listed on the Canadian NDSL (Non-Domestic Substances List)  
Listed on ELINCS (European List of Notified Chemical Substances)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

<table>
<thead>
<tr>
<th>TITANIUM TETRAKIS(DIETHYLAMIDE), 99+% (4419-47-0)</th>
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<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
</tr>
</tbody>
</table>

Titanium tetrakis(diethylamide) (4419-47-0)  
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<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>Non-significant risk level (NSRL)</th>
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</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Non-significant risk level (NSRL)</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::

| H226 | Flammable liquid and vapor |
| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H335 | May cause respiratory irritation |

HMIS III Rating

Health  
3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability  
3 Serious Hazard

Physical  
1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 05/27/2016  
Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

05/27/2016  
EN (English US)  
SDS ID: OMT075  
6/7
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