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

1.1. Product identifier

- **Product form**: Substance
- **Physical state**: Liquid
- **Substance name**: ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)
- **Product code**: OMZR083
- **Formula**: C12H32N4Zr
- **Synonyms**: TETRAKIS(ETHYLMETHYLAMIDO)ZIRCONIUM
- **Chemical family**: METAL COMPOUND

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 3535106-500 - 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 2: H225
- Skin corrosion/irritation, Category 1C: H314
- Serious eye damage/eye irritation, Category 1: H318
- Specific target organ toxicity — Single exposure, Category 3: H335
- Respiratory tract irritation

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)**: 
  - GHS02
  - GHS05
  - GHS07

- **Signal word (CLP)**: Danger
Hazard statements (CLP):
H225 - Highly flammable liquid and vapour.
H314 - Causes severe skin burns and eye damage.
H335 - May cause respiratory irritation.

Precautionary statements (CLP):
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground/bond container and receiving equipment.
P260 - Do not breathe vapours.
P264 - Wash hands thoroughly after handling.
P310 - Immediately call a POISON CENTER or doctor/physician.

2.3. Other hazards
No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type: Mono-constituent
Name: ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)
CAS-No.: 19756-04-8

<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>Zirconium tetrakis(ethylmethylamide)</td>
<td>(CAS-No.) 175923-04-3</td>
<td>&gt; 95</td>
<td>Flam. Liq. 2, H225; Skin Corr. 1C, H314; Eye Dam. 1, H318; STOT SE 3, H335</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.

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.

First-aid measures after skin contact: Wash with plenty of 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/effects: Causes severe skin burns and eye damage.
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.

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: None known.

5.2. Special hazards arising from the substance or mixture
Fire hazard: Highly flammable liquid and vapour. Irritating fumes of ethylmethylamine and organic acid vapors may develop when material is exposed to water or open flame.
 Explosion hazard: May form flammable/explosive vapour-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 vapour 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

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. 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

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. Take precautionary measures against static discharge. Containers must be properly grounded before beginning transfer. 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: Ground/bond container and receiving equipment. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions: Keep container tightly closed.

Incompatible materials: Acids, alcohols, Oxidizing agent. Moisture. Water:

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>Zirconium tetrakis(ethylmethylamide) (175923-04-3)</th>
<th>Italy - Portugal - USA ACGIH</th>
<th>ACGIH TWA (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 ppm (Dimethylamine)</td>
<td></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

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
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

<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>Liquid.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>323.63 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>Pale yellow</td>
</tr>
<tr>
<td>Odour</td>
<td>Acrid. Amine, fishy.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>No additional information available</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>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>&lt; 10 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>81 °C @ 0.1 mm Hg</td>
</tr>
<tr>
<td>Flash point</td>
<td>10 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Highly flammable liquid and vapour.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt; 0.1 mm Hg @ 25°C</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.049</td>
</tr>
<tr>
<td>Solubility</td>
<td>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>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>Oxidising properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available</td>
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</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 stored under a dry inert atmosphere.

#### 10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating ethylmethylamine.

#### 10.4. Conditions to avoid

Heat. Open flame. Sparks.

#### 10.5. Incompatible materials

Acids. alcohols. Oxidizing agent. Moisture. Water:

#### 10.6. Hazardous decomposition products


### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Classification</th>
</tr>
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<tbody>
<tr>
<td>Acute toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)
Safety Data Sheet

STOT-single exposure : May cause respiratory irritation.
STOT-repeated exposure : Not classified
Aspiration hazard : Not classified
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.
Reason for classification : Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Acute aquatic toxicity : Not classified
Chronic aquatic toxicity : 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
Product/Packaging 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 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

14.1. UN number
UN-No. (ADR) : 2924
UN-No. (IMDG) : 2924
UN-No. (IATA) : 2924
UN-No. (ADN) : 2924
UN-No. (RID) : 2924

14.2. UN proper shipping name
Proper Shipping Name (ADR) : FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Proper Shipping Name (IMDG) : FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Proper Shipping Name (IATA) : Flammable liquid, corrosive, n.o.s.
Proper Shipping Name (ADN) : FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Proper Shipping Name (RID) : FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Transport document description (ADR) : UN 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II, (D/E)
Transport document description (IMDG) : UN 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II
Transport document description (IATA) : UN 2924 Flammable liquid, corrosive, n.o.s. (ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II
Transport document description (ADN) : UN 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II
Transport document description (RID) : UN 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)), 3 (8), II
## 14.3. Transport hazard class(es)

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<thead>
<tr>
<th>Mode</th>
<th>Description</th>
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<tr>
<td>ADR</td>
<td>Transport hazard class(es)</td>
<td>3 (8)</td>
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<td></td>
<td>Danger labels</td>
<td>3, 8</td>
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### IMDG

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<td>3 (8)</td>
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<td>Danger labels</td>
<td>3, 8</td>
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</table>

### IATA

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<td>Transport hazard class(es)</td>
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<tr>
<td>Hazard labels</td>
<td>3, 8</td>
</tr>
</tbody>
</table>

### ADN

<table>
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<th>Code</th>
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</thead>
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<tr>
<td>Transport hazard class(es)</td>
<td>3 (8)</td>
</tr>
<tr>
<td>Danger labels</td>
<td>3, 8</td>
</tr>
</tbody>
</table>

### RID

<table>
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<th>Description</th>
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</thead>
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<tr>
<td>Transport hazard class(es)</td>
<td>3 (8)</td>
</tr>
<tr>
<td>Danger labels</td>
<td>3, 8</td>
</tr>
</tbody>
</table>

## 14.4. Packing group

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>IMDG</td>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>IATA</td>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>ADN</td>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>RID</td>
<td>Packing group</td>
<td>II</td>
</tr>
</tbody>
</table>

## 14.5. Environmental hazards

<table>
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<tr>
<th>Description</th>
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<tr>
<td>Dangerous for the environment</td>
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<tr>
<td>Marine pollutant</td>
<td>No</td>
</tr>
<tr>
<td>Other information</td>
<td>No supplementary information available</td>
</tr>
</tbody>
</table>
14.6. Special precautions for user

- Overland transport
  Classification code (ADR) : FC
  Special provisions (ADR) : 274
  Limited quantities (ADR) : 1l
  Excepted quantities (ADR) : E2
  Packing instructions (ADR) : P001, IBC02
  Mixed packing provisions (ADR) : MP19
  Portable tank and bulk container instructions (ADR) : T11
  Portable tank and bulk container special provisions (ADR) : TP2, TP27
  Tank code (ADR) : L4BH
  Vehicle for tank carriage : FL
  Transport category (ADR) : 2
  Special provisions for carriage - Operation (ADR) : S2, S20
  Hazard identification number (Kemler No.) : 338
  Orange plates :
    - Tunnel restriction code (ADR) : D/E

- Transport by sea
  Special provisions (IMDG) : 274
  Limited quantities (IMDG) : 1 L
  Excepted quantities (IMDG) : E2
  Packing instructions (IMDG) : P001
  IBC packing instructions (IMDG) : IBC02
  Tank instructions (IMDG) : T11
  Tank special provisions (IMDG) : TP2, TP27
  EmS-No: (Fire) : F-E
  EmS-No. (Spillage) : S-C
  Stowage category (IMDG) : B
  Stowage and handling (IMDG) : SW2
  Properties and observations (IMDG) : Causes burns to skin, eyes and mucous membranes.

- Air transport
  PCA Excepted quantities (IATA) : E2
  PCA Limited quantities (IATA) : Y340
  PCA limited quantity max net quantity (IATA) : 0.5L
  PCA packing instructions (IATA) : 352
  PCA max net quantity (IATA) : 1L
  CAO packing instructions (IATA) : 363
  CAO max net quantity (IATA) : 5L
  Special provisions (IATA) : A3
  ERG code (IATA) : 3CH

- Inland waterway transport
  Classification code (ADN) : FC
  Special provisions (ADN) : 274
  Limited quantities (ADN) : 1 L
  Excepted quantities (ADN) : E2
  Carriage permitted (ADN) : T
  Equipment required (ADN) : PP, EP, EX, A
  Ventilation (ADN) : VE01
  Number of blue cones/lights (ADN) : 1
ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE)
Safety Data Sheet

- **Rail transport**
  - Classification code (RID): FC
  - Special provisions (RID): 274
  - Limited quantities (RID): 1L
  - Excepted quantities (RID): E2
  - Packing instructions (RID): P001, IBC02
  - Mixed packing provisions (RID): MP19
  - Portable tank and bulk container instructions (RID): T11
  - Tank codes for RID tanks (RID): L4BH
  - Transport category (RID): 2
  - Coils express (express parcels) (RID): CE7
  - Hazard identification number (RID): 338

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
ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE) is not on the REACH Candidate List
ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE) is not on the REACH Annex XIV List
ZIRCONIUM TETRAKIS(ETHYLMETHYLAMIDE) is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

15.1.2. **National regulations**

**Germany**

**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 gifte stoffen – Borstvoeding: The substance is not listed
NIET-limitatieve lijst van voor de voortplanting gifte stoffen – Vruchtbaarheid: The substance is not listed
NIET-limitatieve lijst van voor de voortplanting gifte stoffen – Ontwikkeling: The substance is not listed

**Denmark**
Class for fire hazard: Class I-1
Store unit: 1 liter
Classification remarks: F <Flam. Liq. 2>: Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations: Young people below the age of 18 years are not allowed to use the product

15.2. **Chemical safety assessment**
No additional information available

**SECTION 16: Other information**

Abbreviations and acronyms:
### Other information

Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Dam. 1</td>
<td>Serious eye damage/eye irritation, Category 1</td>
</tr>
<tr>
<td>Flam. Liq. 2</td>
<td>Flammable liquids, Category 2</td>
</tr>
<tr>
<td>Skin Corr. 1C</td>
<td>Skin corrosion/irritation, Category 1C</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation</td>
</tr>
<tr>
<td>H225</td>
<td>Highly flammable liquid and vapour.</td>
</tr>
<tr>
<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>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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