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

1.1. **Product identifier**

<table>
<thead>
<tr>
<th>Product form</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Product name</td>
<td>HARDSIL™ AM</td>
</tr>
<tr>
<td>Product code</td>
<td>PP1-HSAM</td>
</tr>
<tr>
<td>Synonyms</td>
<td>METHYLSELSESQUIOXANE RESIN SOLUTION; METHYL T RESIN SILOXANE SOLUTION</td>
</tr>
<tr>
<td>Chemical family</td>
<td>ORGANO SILOXANE</td>
</tr>
</tbody>
</table>

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@gelestdde.com - www.gelestdde.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]

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category</th>
<th>H Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids, Category 2</td>
<td></td>
<td>H225</td>
</tr>
<tr>
<td>Acute toxicity (oral), Category 3</td>
<td></td>
<td>H301</td>
</tr>
<tr>
<td>Acute toxicity (dermal), Category 3</td>
<td></td>
<td>H311</td>
</tr>
<tr>
<td>Acute toxicity (inhalation:vapour) Category 3</td>
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<td>H331</td>
</tr>
<tr>
<td>Skin corrosion/irritation, Category 2</td>
<td></td>
<td>H315</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation, Category 1</td>
<td></td>
<td>H318</td>
</tr>
<tr>
<td>Specific target organ toxicity — single exposure, Category 1</td>
<td></td>
<td>H370</td>
</tr>
<tr>
<td>Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation</td>
<td></td>
<td>H335</td>
</tr>
<tr>
<td>Specific target organ toxicity — Single exposure, Category 3, Narcosis</td>
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<td>H336</td>
</tr>
</tbody>
</table>

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**
- **GHS06**
- **GHS08**

Signal word (CLP): Danger

Hazardous ingredients:
- Isopropanol; Methanol; n-Butanol

Hazard statements (CLP):
- H225 - Highly flammable liquid and vapour.
- H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled
- H315 - Causes skin irritation.
- H318 - Causes serious eye damage.
- H335 - May cause respiratory irritation.
- H336 - May cause drowsiness or dizziness.
- H370 - Causes damage to organs.

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

Not applicable

3.2. Mixtures

<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>Isopropanol</td>
<td>(CAS-No.) 67-63-0 (EC-No.) 200-661-7</td>
<td>30 - 60</td>
<td>Flam. Liq. 2, H225  Eye Irrit. 2, H319  STOT SE 3, H335</td>
</tr>
<tr>
<td>Methylsilsesquioxane resin</td>
<td>(CAS-No.) 96195-80-1</td>
<td>10 - 30</td>
<td>Not classified</td>
</tr>
<tr>
<td>Methanol</td>
<td>(CAS-No.) 67-56-1 (EC-No.) 200-659-6</td>
<td>10 - 30</td>
<td>Flam. Liq. 2, H225  Acute Tox. 3 (Oral), H301  Acute Tox. 3 (Dermal), H311  Acute Tox. 3 (Inhalation:vapour), H331  STOT SE 1, H370</td>
</tr>
<tr>
<td>n-Butanol</td>
<td>(CAS-No.) 71-36-3 (EC-No.) 200-751-6</td>
<td>10 - 30</td>
<td>Flam. Liq. 3, H226  Acute Tox. 4 (Oral), H302  Skin Irrit. 2, H315  Eye Dam. 1, H318  STOT SE 3, H335  STOT SE 3, H336</td>
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</tbody>
</table>

Specific concentration limits:

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>Specific concentration limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>(CAS-No.) 67-56-1 (EC-No.) 200-659-6</td>
<td>(3 &lt;= C &lt; 10) STOT SE 2, H371 (10 &lt;= C &lt; 100) STOT SE 1, H370</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

**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. Call a POISON CENTER/doctor.
First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice/advice. Immediately call a POISON CENTER/doctor.

First-aid measures after skin contact: Wash with plenty of water/…. Get immediate medical advice/advice. Immediately call a POISON CENTER/doctor.

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/advice.

First-aid measures after ingestion: Never give anything by mouth to an unconscious person. Immediately call a POISON CENTER/doctor.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/effects: Causes damage to organs.
Symptoms/effects after inhalation: Toxic if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact: Toxic in contact with skin. Causes skin irritation. Repeated exposure to this material can result in absorption through skin causing significant health hazard.
Symptoms/effects after eye contact: Causes serious eye damage.
Symptoms/effects after ingestion: Toxic if swallowed. 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

5.2. Special hazards arising from the substance or mixture
Fire hazard: Highly flammable liquid and vapour. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures 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
Protective equipment: Wear protective equipment as described in Section 8.

Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment: For further information refer to section 8: “Exposure controls/personal protection”, Equip cleanup crew with proper protection. Do not attempt to take action without suitable protective equipment.

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 collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

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 vapours are flammable. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
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. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. 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: 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 < 5°C.


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>Isopropanol (67-63-0)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>MAK (mg/m³)</td>
<td>500 mg/m³ (short time value for large casting)</td>
</tr>
<tr>
<td>Austria</td>
<td>MAK (ppm)</td>
<td>200 ppm (short time value for large casting)</td>
</tr>
<tr>
<td>Austria</td>
<td>MAK Short time value (mg/m³)</td>
<td>2000 mg/m³ (STEL for large casting valid till 12/31/2013)</td>
</tr>
<tr>
<td>Austria</td>
<td>MAK Short time value (ppm)</td>
<td>800 ppm (STEL for large casting valid till 12/31/2013)</td>
</tr>
<tr>
<td>Belgium</td>
<td>Limit value (mg/m³)</td>
<td>500 mg/m³</td>
</tr>
<tr>
<td>Belgium</td>
<td>Limit value (ppm)</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Belgium</td>
<td>Short time value (mg/m³)</td>
<td>1000 mg/m³</td>
</tr>
<tr>
<td>Belgium</td>
<td>Short time value (ppm)</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>OEL TWA (mg/m³)</td>
<td>980 mg/m³</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>OEL STEL (mg/m³)</td>
<td>1225 mg/m³</td>
</tr>
<tr>
<td>France</td>
<td>VLE (mg/m³)</td>
<td>980 mg/m³</td>
</tr>
<tr>
<td>France</td>
<td>VLE (ppm)</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 900 Occupational exposure limit value (mg/m³)</td>
<td>500 mg/m³ (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)</td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 900 Occupational exposure limit value (ppm)</td>
<td>200 ppm (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)</td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 903 Biological limit value</td>
<td>25 mg/l (Medium: whole blood - Time: end of shift - Parameter: Acetone) 25 mg/l (Medium: urine - Time: end of shift - Parameter: Acetone)</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL TWA (mg/m³)</td>
<td>980 mg/m³</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL TWA (ppm)</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL STEL (mg/m³)</td>
<td>1225 mg/m³</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL STEL (ppm)</td>
<td>500 ppm</td>
</tr>
<tr>
<td>Italy - Portugal - USA ACGIH</td>
<td>ACGIH TWA (ppm)</td>
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<td>Latvia</td>
<td>OEL TWA (mg/m³)</td>
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<td>NIOSH REL (TWA) (mg/m³)</td>
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<tr>
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<td>500 ppm</td>
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<tr>
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<td>OSHA PEL (TWA) (mg/m³)</td>
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<td>OSHA PEL (TWA) (ppm)</td>
<td>400 ppm</td>
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<tr>
<td>Spain</td>
<td>VLA-ED (mg/m³)</td>
<td>500 mg/m³ (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound)</td>
</tr>
<tr>
<td>Spain</td>
<td>VLA-ED (ppm)</td>
<td>200 ppm (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound)</td>
</tr>
<tr>
<td>Spain</td>
<td>VLA-EC (mg/m³)</td>
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<tr>
<td>Spain</td>
<td>VLA-EC (ppm)</td>
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</tr>
<tr>
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<td>Standard</td>
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<td>-------------------------</td>
<td>-----------------------</td>
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<td>United Kingdom</td>
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<td>WEL TWA (ppm)</td>
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</tr>
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<td>United Kingdom</td>
<td>WEL STEL (mg/m³)</td>
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</tr>
<tr>
<td>United Kingdom</td>
<td>WEL STEL (ppm)</td>
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</tr>
<tr>
<td>Czech Republic</td>
<td>Expoziční limity (PEL)</td>
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<tr>
<td>Denmark</td>
<td>Grænseværdie (langvarig)</td>
<td>490</td>
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<td>Grænseværdie (langvarig) (ppm)</td>
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</tr>
<tr>
<td>Finland</td>
<td>HTP-arvo (8h) (mg/m³)</td>
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<td>HTP-arvo (8h) (ppm)</td>
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<td>HTP-arvo (15 min) (ppm)</td>
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<td>Hungary</td>
<td>AK-érték</td>
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<tr>
<td>Hungary</td>
<td>CK-érték</td>
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<tr>
<td>Ireland</td>
<td>OEL (8 hours ref) (ppm)</td>
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<tr>
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<td>OEL (15 min ref) (ppm)</td>
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<td>Lithuania</td>
<td>IPRV (mg/m³)</td>
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<td>Romania</td>
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<td>NPHV (priemerná) (mg/m³)</td>
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<tr>
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<td>NPHV (Hraníčná) (mg/m³)</td>
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<td>Sweden</td>
<td>nivågränsvärde (NVG) (mg/m³)</td>
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<td>Australia</td>
<td>STEL (ppm)</td>
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</tr>
<tr>
<td>Portugal</td>
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<tr>
<td>Portugal</td>
<td>OEL STEL (ppm)</td>
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</tr>
<tr>
<td>Portugal</td>
<td>OEL chemical category (PT)</td>
<td>A4 - Not Classifiable as a Human Carcinogen</td>
</tr>
<tr>
<td>Country/Region</td>
<td>Exposure Limit</td>
<td>Unit</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>EU</td>
<td>IOELV TWA (mg/m³)</td>
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</tr>
<tr>
<td>EU</td>
<td>IOELV TWA (ppm)</td>
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</tr>
<tr>
<td>Austria</td>
<td>MAK (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>MAK (ppm)</td>
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<tr>
<td>Austria</td>
<td>MAK Short time value (mg/m³)</td>
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</tr>
<tr>
<td>Austria</td>
<td>MAK Short time value (ppm)</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>Limit value (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>Limit value (ppm)</td>
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</tr>
<tr>
<td>Belgium</td>
<td>Short time value (mg/m³)</td>
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<tr>
<td>Belgium</td>
<td>Short time value (ppm)</td>
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</tr>
<tr>
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<td>OEL TWA (mg/m³)</td>
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</tr>
<tr>
<td>Bulgaria</td>
<td>OEL TWA (ppm)</td>
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</tr>
<tr>
<td>Cyprus</td>
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<tr>
<td>Cyprus</td>
<td>OEL TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>VLE (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>VLE (ppm)</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>VME (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>VME (ppm)</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 900 Occupational exposure limit value (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 900 Occupational exposure limit value (ppm)</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>TRGS 903 Biological limit value</td>
<td></td>
</tr>
<tr>
<td>Gibraltar</td>
<td>Eight hours mg/m³</td>
<td></td>
</tr>
<tr>
<td>Gibraltar</td>
<td>Eight hours ppm</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>OEL TWA (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>OEL TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>OEL STEL (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>OEL STEL (ppm)</td>
<td></td>
</tr>
<tr>
<td>Italy - Portugal - USA ACGIH</td>
<td>ACGIH TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>Italy - Portugal - USA ACGIH</td>
<td>ACGIH STEL (ppm)</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>OEL TWA (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>OEL TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>OEL TWA (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>OEL TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>USA IDLH</td>
<td>US IDLH (ppm)</td>
<td></td>
</tr>
<tr>
<td>USA NIOSH</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>USA NIOSH</td>
<td>NIOSH REL (TWA) (ppm)</td>
<td></td>
</tr>
<tr>
<td>USA NIOSH</td>
<td>NIOSH REL (STEL) (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>USA NIOSH</td>
<td>NIOSH REL (STEL) (ppm)</td>
<td></td>
</tr>
<tr>
<td>USA OSHA</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>USA OSHA</td>
<td>OSHA PEL (TWA) (ppm)</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>VLA-ED (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>VLA-ED (ppm)</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>KZGW (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>KZGW (ppm)</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>MAK (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>MAK (ppm)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>Grenswaarde TGG 8H (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>Grenswaarde TGG 8H (ppm)</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>WEL TWA (mg/m³)</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>WEL TWA (ppm)</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>WEL STEL (mg/m³)</td>
<td></td>
</tr>
</tbody>
</table>
**n-Butanol (71-36-3)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Exposure Limit Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulgaria</strong></td>
<td>OEL TWA (mg/m³)</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td><strong>Bulgaria</strong></td>
<td>OEL STEL (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>France</strong></td>
<td>VLE (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>France</strong></td>
<td>VLE (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td>TRGS 900 TWA</td>
<td>310 mg/m³ (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td>TRGS 900 STEL</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td>TRGS 903 Biological limit</td>
<td>10 mg/g (Medium: urine - Time: end of shift - Parameter: 1-Butanol (after hydrolysis))</td>
</tr>
<tr>
<td><strong>Greece</strong></td>
<td>OEL TWA (mg/m³)</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td><strong>Greece</strong></td>
<td>OEL TWA (ppm)</td>
<td>100 ppm</td>
</tr>
<tr>
<td><strong>Greece</strong></td>
<td>OEL STEL (mg/m³)</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td><strong>Greece</strong></td>
<td>OEL STEL (ppm)</td>
<td>100 ppm</td>
</tr>
<tr>
<td><strong>Italy - Portugal - USA ACGIH</strong></td>
<td>ACGIH TWA (ppm)</td>
<td>20 ppm</td>
</tr>
<tr>
<td><strong>Latvia</strong></td>
<td>OEL TWA (mg/m³)</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td><strong>USA IDLH</strong></td>
<td>US IDLH (ppm)</td>
<td>1400 ppm (10% LEL)</td>
</tr>
<tr>
<td><strong>USA NIOSH</strong></td>
<td>NIOSH REL (ceiling) (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>USA NIOSH</strong></td>
<td>NIOSH REL (ceiling) (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>USA OSHA</strong></td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td><strong>USA OSHA</strong></td>
<td>OSHA PEL (TWA) (ppm)</td>
<td>100 ppm</td>
</tr>
<tr>
<td><strong>Spain</strong></td>
<td>VLA-ED (mg/m³)</td>
<td>61 mg/m³</td>
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<tr>
<td><strong>Spain</strong></td>
<td>VLA-ED (ppm)</td>
<td>20 ppm</td>
</tr>
<tr>
<td><strong>Spain</strong></td>
<td>VLA-EC (mg/m³)</td>
<td>154 mg/m³</td>
</tr>
<tr>
<td><strong>Spain</strong></td>
<td>VLA-EC (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>Switzerland</strong></td>
<td>KZGW (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>Switzerland</strong></td>
<td>KZGW (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>Switzerland</strong></td>
<td>MAK (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>Switzerland</strong></td>
<td>MAK (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>United Kingdom</strong></td>
<td>WEL STEL (mg/m³)</td>
<td>154 mg/m³</td>
</tr>
<tr>
<td><strong>United Kingdom</strong></td>
<td>WEL STEL (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>Czech Republic</strong></td>
<td>Expoziční limity (PEL) (mg/m³)</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>HTP-arvo (8h) (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>HTP-arvo (8h) (ppm)</td>
<td>50 ppm</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>HTP-arvo (15 min) (mg/m³)</td>
<td>230 mg/m³</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>HTP-arvo (15 min) (ppm)</td>
<td>75 ppm</td>
</tr>
<tr>
<td><strong>Hungary</strong></td>
<td>AK-érték</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td><strong>Hungary</strong></td>
<td>CK-érték</td>
<td>90 mg/m³</td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td>OEL (8 hours ref) (ppm)</td>
<td>20 ppm</td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td>OEL (15 min ref) (ppm)</td>
<td>60 ppm (calculated)</td>
</tr>
<tr>
<td><strong>Lithuania</strong></td>
<td>IPRV (mg/m³)</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td><strong>Lithuania</strong></td>
<td>IPRV (ppm)</td>
<td>15 ppm</td>
</tr>
<tr>
<td><strong>Lithuania</strong></td>
<td>NRV (mg/m³)</td>
<td>90 mg/m³</td>
</tr>
<tr>
<td><strong>Lithuania</strong></td>
<td>NRV (ppm)</td>
<td>30 ppm</td>
</tr>
<tr>
<td><strong>Norway</strong></td>
<td>Grenseverdi (Takverdi) (mg/m³)</td>
<td>75 mg/m³</td>
</tr>
<tr>
<td><strong>Norway</strong></td>
<td>Grenseverdi (Takverdi) (ppm)</td>
<td>25 ppm</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>NDS (mg/m³)</td>
<td>50 mg/m³</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>NDSCh (mg/m³)</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td><strong>Romania</strong></td>
<td>OEL TWA (mg/m³)</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td><strong>Romania</strong></td>
<td>OEL TWA (ppm)</td>
<td>33 ppm</td>
</tr>
<tr>
<td><strong>Romania</strong></td>
<td>OEL STEL (mg/m³)</td>
<td>200 mg/m³</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. 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 organic vapor (black 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>
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</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Colour</td>
<td>Straw. Amber.</td>
</tr>
<tr>
<td>Odour</td>
<td>Odor of alcohols.</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; -20 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>19 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>385 °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 vapour.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>% Volatiles</td>
<td>&gt; 60 %</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>
</tbody>
</table>
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosive properties: No data available
Oxidising properties: No data available
Explosive limits: 1.7 - 36.5 vol % (lower; upper)

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 hydrogen chloride.

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

10.5. Incompatible materials

10.6. Hazardous decomposition products
Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled.

ATE CLP:
- Oral: 295.88 mg/kg bodyweight
- Dermal: 1000 mg/kg bodyweight
- Vapours: 10 mg/l/4h

Isopropanol (67-63-0):
- LD50 oral rat: 1870 mg/kg
- LD50 dermal rabbit: 4059 mg/kg
- LC50 inhalation rat (mg/l): 72600 mg/m³ (Exposure time: 4 h)
- ATE CLP oral: 4396 mg/kg bodyweight
- ATE CLP dermal: 12800 mg/kg bodyweight

Methanol (67-56-1):
- LC50 inhalation rat (ppm): 22500 ppm (Exposure time: 8 h)
- ATE CLP oral: 100 mg/kg bodyweight
- ATE CLP dermal: 300 mg/kg bodyweight
- ATE CLP vapours: 3 mg/l/4h

n-Butanol (71-36-3):
- LD50 oral rat: 700 mg/kg
- LD50 dermal rabbit: 3402 mg/kg
- LC50 inhalation rat (ppm): > 8000 ppm/4h
- ATE CLP oral: 500 mg/kg bodyweight

Skin corrosion/irritation: Causes skin irritation.
Serious eye damage/irritation: Causes serious eye damage.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified

Isopropanol (67-63-0):
- IARC group: 3 - Not classifiable

Reproductive toxicity: Not classified
STOT-single exposure: Causes damage to organs. May cause respiratory irritation. May cause drowsiness or dizziness.
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified
Symptoms/effects after inhalation: Toxic if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact: Toxic in contact with skin. Causes skin irritation. Repeated exposure to this material can result in absorption through skin causing significant health hazard.
Symptoms/effects after eye contact: Causes serious eye damage.
Symptoms/effects after ingestion: Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
Reason for classification: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Acute aquatic toxicity: Not classified
Chronic aquatic toxicity: Not classified

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50 fish 1</th>
<th>EC50 Daphnia 1</th>
<th>LC50 fish 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol (67-63-0)</td>
<td>9640 mg/l (96 h)</td>
<td>11329 mg/l (48 h)</td>
<td>11130 mg/l (96 h)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>13299 mg/l (48 h)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methanol (67-56-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50 fish 1</td>
<td>28200 mg/l (96 h)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>&gt; 100 mg/l (96 h)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Log Pow (at 25 °C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol (67-63-0)</td>
<td>0.05</td>
</tr>
<tr>
<td>Methanol (67-56-1)</td>
<td>-0.77</td>
</tr>
<tr>
<td>n-Butanol (71-36-3)</td>
<td>0.64</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sewage disposal recommendations</th>
<th>Do not dispose of waste into sewer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product/Packaging disposal recommendations</td>
<td>May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.</td>
</tr>
<tr>
<td>Ecology - waste materials</td>
<td>Avoid release to the environment.</td>
</tr>
</tbody>
</table>

SECTION 14: Transport information

14.1. UN number
In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number
UN-No. (ADR): 1139
14.2. UN proper shipping name

Proper Shipping Name (ADR): COATING SOLUTION
Proper Shipping Name (IMDG): COATING SOLUTION
Proper Shipping Name (IATA): Coating solution
Proper Shipping Name (ADN): COATING SOLUTION
Proper Shipping Name (RID): COATING SOLUTION

Transport document description (ADR): UN 1139 COATING SOLUTION (METHANOL & n-BUTYL ALCOHOL), 3, II, (D/E)
Transport document description (IMDG): UN 1139 COATING SOLUTION (METHANOL & n-BUTYL ALCOHOL), 3, II
Transport document description (IATA): UN 1139 Coating solution (METHANOL & n-BUTYL ALCOHOL), 3, II
Transport document description (ADN): UN 1139 COATING SOLUTION (METHANOL & n-BUTYL ALCOHOL), 3, II
Transport document description (RID): UN 1139 COATING SOLUTION (METHANOL & n-BUTYL ALCOHOL), 3, II

14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR): 3
Danger labels (ADR): 3

IMDG
Transport hazard class(es) (IMDG): 3
Danger labels (IMDG): 3

IATA
Transport hazard class(es) (IATA): 3
Hazard labels (IATA): 3

ADN
Transport hazard class(es) (ADN): 3
Danger labels (ADN): 3

RID
Transport hazard class(es) (RID): 3
Danger labels (RID): 3
14.4. Packing group

Packing group (ADR) : II
Packing group (IMDG) : II
Packing group (IATA) : II
Packing group (ADN) : II
Packing group (RID) : II

14.5. Environmental hazards

Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport
  Classification code (ADR) : F1
  Special provisions (ADR) : 640C
  Limited quantities (ADR) : 51
  Excepted quantities (ADR) : E2
  Packing instructions (ADR) : P001
  Mixed packing provisions (ADR) : MP19
  Portable tank and bulk container instructions (ADR) : T4
  Portable tank and bulk container special provisions (ADR) : TP1, TP8
  Tank code (ADR) : L1.5BN
  Vehicle for tank carriage : FL
  Transport category (ADR) : 2
  Special provisions for carriage - Operation (ADR) : S2, S20
  Hazard identification number (Kemler No.) : 33
  Orange plates : 33
  Tunnel restriction code (ADR) : D/E

- Transport by sea
  Limited quantities (IMDG) : 5 L
  Excepted quantities (IMDG) : E2
  Packing instructions (IMDG) : P001
  IBC packing instructions (IMDG) : IBC02
  Tank instructions (IMDG) : T4
  Tank special provisions (IMDG) : TP1, TP8
  EmS-No. (Fire) : F-E
  EmS-No. (Spillage) : S-E
  Stowage category (IMDG) : B
  Properties and observations (IMDG) : Miscibility with water depends upon the composition.

- Air transport
  PCA Excepted quantities (IATA) : E2
  PCA Limited quantities (IATA) : Y341
  PCA limited quantity max net quantity (IATA) : 1L
  PCA packing instructions (IATA) : 353
  PCA max net quantity (IATA) : 5L
  CAO packing instructions (IATA) : 364
HARDSIL™ AM
Safety Data Sheet

CAO max net quantity (IATA): 60L
Special provisions (IATA): A3
ERG code (IATA): 3L

- Inland waterway transport
  Classification code (ADN): F1
  Special provisions (ADN): 640C
  Limited quantities (ADN): 5 L
  Excepted quantities (ADN): E2
  Equipment required (ADN): PP, EX, A
  Ventilation (ADN): VE01
  Number of blue cones/lights (ADN): 1

- Rail transport
  Classification code (RID): F1
  Special provisions (RID): 640C
  Limited quantities (RID): 5 L
  Excepted quantities (RID): E2
  Packing instructions (RID): P001
  Mixed packing provisions (RID): MP19
  Portable tank and bulk container instructions (RID): T4
  Portable tank and bulk container special provisions (RID): TP1, TP8
  Tank codes for RID tanks (RID): L1.5BN
  Transport category (RID): 2
  Coils express (express parcels) (RID): CE7
  Hazard identification number (RID): 33

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
Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances
Contains no REACH Annex XIV substances

% Volatiles: > 60 %

15.1.2 National regulations

Germany
Reference to AwSV: Water hazard class (WGK) 3, Highly hazardous to water (Classification according to AwSV, Annex 1)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV: Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands
SZW-lijst van kankerverwekkende stoffen: None of the components are listed
SZW-lijst van mutagene stoffen: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling: Methanol is 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. Pregnant/breastfeeding women working with the product must not be in direct contact with the product

### 15.2. Chemical safety assessment

No additional information available

### SECTION 16: Other information

Abbreviations and acronyms:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox. 3 (Dermal)</td>
<td>Acute toxicity (dermal), Category 3</td>
</tr>
<tr>
<td>Acute Tox. 3 (Inhalation:vapour)</td>
<td>Acute toxicity (inhalation:vapour) Category 3</td>
</tr>
<tr>
<td>Acute Tox. 3 (Oral)</td>
<td>Acute toxicity (oral), Category 3</td>
</tr>
<tr>
<td>Acute Tox. 4 (Oral)</td>
<td>Acute toxicity (oral), Category 4</td>
</tr>
<tr>
<td>Eye Dam. 1</td>
<td>Serious eye damage/eye irritation, Category 1</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>Serious eye damage/eye irritation, Category 2</td>
</tr>
<tr>
<td>Flam. Liq. 2</td>
<td>Flammable liquids, Category 2</td>
</tr>
<tr>
<td>Flam. Liq. 3</td>
<td>Flammable liquids, Category 3</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/Irritation, Category 2</td>
</tr>
<tr>
<td>STOT SE 1</td>
<td>Specific target organ toxicity — single exposure, Category 1</td>
</tr>
<tr>
<td>STOT SE 2</td>
<td>Specific target organ toxicity — Single exposure, Category 2</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>H226</td>
<td>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>H301</td>
<td>Toxic if swallowed.</td>
</tr>
<tr>
<td>H302</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>H311</td>
<td>Toxic in contact with skin.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H331</td>
<td>Toxic if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H336</td>
<td>May cause drowsiness or dizziness.</td>
</tr>
<tr>
<td>H370</td>
<td>Causes damage to organs.</td>
</tr>
<tr>
<td>H371</td>
<td>May cause damage to organs.</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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Gelest HardSil™ AM
Silicone Resin Hard Coatings

Features: Provides clear silicone hard coat with excellent optical properties. HardSil™ A series are curable poly-silsesquioxane T-resins with excellent abrasion resistance.

Applications:
**Optical Thermoplastics** - provides effective scratch-resistant coatings with good weather resistance for polycarbonates and polyacrylates. Examples include glazing, windscreen, computer screen and ophthalmic applications.

**Laminated Structures** - hard, heat resistant impregnants for continuous exposures up to 360°C.

<table>
<thead>
<tr>
<th>Capsular Description:</th>
<th>Thickness</th>
<th>Cure</th>
<th>Hardness</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>thin-thick</td>
<td>thermal</td>
<td>high</td>
<td>solvent-borne 1-part</td>
</tr>
</tbody>
</table>

**HardSil™ AM** Abrasion Resistant Coating - Thermal Cure

**Description**
HardSil™ AM is a primerless acrylated silicone nanocomposite dispersed in a mixture of alcohols including methanol, n-butanol and isopropanol. The nanocomposite structure imparts scratch resistance to a clear film structure.

**Film Properties**
- **Color**: clear
- **Abrasion Resistance**: Taber 500 cycles 500g CS10F - 5

**Solution Properties**
- **Form**: solution
- **Solids**: 19-21%
- **Flashpoint**: 19°C
- **Specific Gravity**: 0.91
- **Viscosity**: 5-15 cSt.

**Shelf Life**: 3 months when stored below 5°C in sealed containers. Containers should be warmed to 15°C before opening to reduce condensation of water.

**Standard Packaging**
- PP1-HSAM HardSil™ AM
  - 100g/$39.00
  - 750g/$210.00
  - 10kg/commercial package

**Cautions**
Use in a well ventilated area.
Flammable.
Avoid contact with skin and eyes.

**Application Methods**
Gelest HardSil™ AM is applied as a coating by spraying, dipping or brushing. After solvent evaporation, the system cures in 30-60 minutes at 125-140°C. As supplied, typical film deposition is 6-8 microns. Thinner films may be prepared by diluting with methoxypropanol or isopropanol.