SECTION 1: Identification

1.1. Identification

Product name: GELEST OPTICAL ENCAPSULANT 41 LOW VOLATILITY GRADE 1 KG KIT
Product code: PP2-OE41.6
Product form: Mixture
Physical state: Liquid
Synonyms: Gelest OE™ 41.6 2-part Low Volatility Optical Encapsulant VINYL MODIFIED SILICA Q RESIN in POLY(DIMETHYLSILOXANE), VINYL TERMINATED with (part B) HYDRIDE FUNCTIONAL CROSSLINKER RESIN REINFORCED VINYL TERMINATED POLYDIMETHYLSILOXANE
Chemical family: ORGANOSILOXANE

1.2. Recommended use and restrictions on use

Recommended use: Chemical intermediate

1.3. Supplier

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification: Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labeling: No labeling applicable

2.3. Hazards not otherwise classified (HNOC)

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

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>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A: Monovinyl terminated polydimethylsiloxane</td>
<td>(CAS-No.) 68951-99-5</td>
<td>&gt; 70</td>
<td>Not classified</td>
</tr>
<tr>
<td>Vinyl modified Q silica resin</td>
<td>(CAS-No.) 68584-83-8</td>
<td>&lt; 30</td>
<td>Not classified</td>
</tr>
<tr>
<td>Part B: Methylhydrosiloxane-dimethylsiloxane copolymer, trimethylsiloxane terminated</td>
<td>(CAS-No.) 68037-59-2</td>
<td>&lt; 10</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

Full text of hazard classes and 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.

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 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 medical advice/attention.
4.1. First-aid measures after ingestion: Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects (acute and delayed)
- Symptoms/effects after inhalation: No information available.
- Symptoms/effects after skin contact: May cause skin irritation.
- Symptoms/effects after eye contact: May cause eye irritation.
- Symptoms/effects after ingestion: No information available.

4.3. Immediate medical attention and special treatment, if necessary
No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media
- Unsuitable extinguishing media: None known.

5.2. Specific hazards arising from the chemical
- Fire hazard: Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

5.3. Special protective equipment and precautions for fire-fighters
- Firefighting instructions: Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers.
- 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
- For non-emergency personnel
  - Protective equipment: Wear protective equipment as described in Section 8.
  - Emergency procedures: Evacuate unnecessary personnel.
- For emergency responders
  - Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: “Exposure controls/personal protection”.

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
- For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
- Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
- Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist.
- Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
- Storage conditions: Keep container tightly closed.
- Storage area: Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available
8.2. Appropriate engineering controls

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

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical goggles. 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

Physical state: Liquid
Appearance: Clear liquid.
Molecular mass: (mixture)
Color: No data available
Odor: No data available
Odor threshold: No data available
Refractive index: No data available
pH: No data available
Relative evaporation rate (butyl acetate=1): No data available
Melting point: < -60 °C
Freezing point: No data available
Boiling point: > 205 °C
Flash point: 220 °C
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapor pressure: < 1 mm Hg @ 20°C
Relative vapor density at 20 °C: No data available
Relative density: 1.01
% Volatiles: < 3 %
Solubility: Insoluble in water.
Log Pow: No data available
Log Kow: No data available
Viscosity, kinematic: 1000 - 4000 cSt
Viscosity, dynamic: No data available
Explosive properties: No data available
Oxidizing properties: No data available
Explosion limits: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available
10.2. Chemical stability
Stable in sealed containers stored under a dry inert atmosphere.

10.3. Possibility of hazardous reactions
No additional information available

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

10.5. Incompatible materials

10.6. Hazardous decomposition products
Organic acid vapors. Silicon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

- Acute toxicity: Not classified
- Skin corrosion/irritation: Not classified
- Serious eye damage/irritation: Not classified
- Respiratory or skin sensitization: Not classified
- Germ cell mutagenicity: Not classified
- Carcinogenicity: Not classified

- Reproductive toxicity: Not classified
- Specific target organ toxicity – single exposure: Not classified
- Specific target organ toxicity – repeated exposure: Not classified

- Aspiration hazard: Not classified
- Symptoms/effects after inhalation: No information available.
- Symptoms/effects after skin contact: May cause skin irritation.
- Symptoms/effects after eye contact: May cause eye irritation.
- Symptoms/effects after ingestion: No information available.

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
Effect on the ozone layer: No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods
- Sewage disposal recommendations: Do not dispose of waste into sewer.
- Product/Package disposal recommendations: Incinerate. Dispose in a safe manner in accordance with local/national regulations.
- Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number
Not regulated for transport.

14.2. UN proper shipping name
Not applicable
14.3. Additional information

Other information: No supplementary information available.

Transport by sea
No additional information available

Air transport
No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Part A: Monovinyl terminated polydimethylsiloxane (68951-99-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Vinyl modified Q silica resin (68584-83-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Part B: Methylhydrosiloxane-dimethylsiloxane copolymer, trimethylsiloxane terminated (68037-59-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Part A: Monovinyl terminated polydimethylsiloxane (68951-99-5)
Listed on the Canadian DSL (Domestic Substances List)

Vinyl modified Q silica resin (68584-83-8)
Listed on the Canadian DSL (Domestic Substances List)

Part B: Methylhydrosiloxane-dimethylsiloxane copolymer, trimethylsiloxane terminated (68037-59-2)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations
No additional information available

Vinyl modified Q silica resin (68584-83-8)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Part A: Monovinyl terminated polydimethylsiloxane (68951-99-5)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)

Vinyl modified Q silica resin (68584-83-8)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
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)

Part B: Methylhydrosiloxane-dimethylsiloxane copolymer, trimethylsiloxane terminated (68037-59-2)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
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

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

SECTION 16: Other information
GELEST OPTICAL ENCAPSULANT 41 LOW VOLATILITY GRADE 1 KG KIT
Safety Data Sheet

Abbreviations and acronyms:
Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor.

Hazard Rating
Health: 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability: 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)
Physical: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Prepared by safety and environmental affairs.
Date of issue: 08/25/2016 Version: 1.0

SDS US (GHS HazCom 2012) - Custom
According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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 Flexible Optical Encapsulant Series

Filler-Free 2-part Silicone Elastomers

Features: Provide rapid-cure pure silicone elastomers with high optical transmission. They have relatively low viscosity and extended pot-life, allowing potting, embedding and coating. Systems are vinyl-addition (platinum) cure.

Applications:
- **electronic devices** - provide mechanical and chemical protection to electronic components, free of abrasive silica.
- **optical devices** - index matching, cladding or transmission media applications.
- **supported membranes** - filler-free silicone allows maximum transport of gases.

<table>
<thead>
<tr>
<th>Capsular Description</th>
<th>Thickness</th>
<th>Cure Pt</th>
<th>Hardness</th>
<th>Type</th>
<th>100% active 2-part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gelest OE™ 41</td>
<td>thick</td>
<td>catalyst</td>
<td>medium</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Gelest OE™ 41**
- 1.41 refractive index 2-part silicone RTV encapsulant, supplied as 1:1 kit

**Description**

Gelest OE™ 41 is a flexible, optically clear molding, encapsulation and coating compound. The low viscosity of the catalyzed mix, long pot-life at room temperature and moderate cure temperature make this extremely useful in laboratory, prototype and small production run applications.

**Cured Properties**
- Refractive Index: 1.407
- Tensile Strength: >300 psi
- Elongation: 140-200%
- Durometer, Shore A: 15-30
- Tear Strength: 5-15 pli

**Uncured Properties of Gelest OE™ 41**
- Viscosity (1:1) catalyzed: 1750-2500 cSt.

**Application Methods**

Thoroughly mix Part A with Part B in a 1:1 ratio. De-air mix under vacuum for about 20 minutes. The pot-life is 18 hours at 25°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature over 72 hours.

**Standard Packaging**

- PP2-OE41: Gelest OE™ 41
- 1 kg kit (500g OE41A, 500g OE41B): $84.00
- 6 kg kit (3kg OE41A, 3kg OE41B): $384.00

Gelest OE™ 41 is available in other versions in which cure speed or volatile content has been varied to match special requirements.

**Gelest OE™ 41.2 Accelerated Cure**

Rapid cure version of standard Gelest OE™ 41, cures in less than 1 hour at room temperature, has a working time of about 10 minutes.

- PP2-OE41.2: Gelest OE™ 41.2
- 1 kg kit (500g OE41.2A, 500g OE41.2B): $96.00
- 6 kg kit (3kg OE41.2A, 3kg OE41.2B): $384.00

**Gelest OE™ 41.4 Extended Cure**

Slow cure version of standard Gelest OE™ 41, offers a pot-life of 48 hours at room temperature. Cures in one hour at 120°C.

- PP2-OE41.4: Gelest OE™ 41.4B
- 1 kg kit (500g OE41.4A, 500g OE41.4B): $96.00
- 6 kg kit (3kg OE41.4A, 3kg OE41.4B): $384.00

**Gelest OE™ 41.6 Low Volatility**

Rapid cure version of standard Gelest OE™ 41, offers a pot-life of 48 hours at room temperature. Cures in one hour at 120°C.

- PP2-OE41.6: Gelest OE™ 41.6
- 1 kg kit (500g OE41.6A, 500g OE41.6B): $96.00
- 6 kg kit (3kg OE41.6A, 3kg OE41.6B): $384.00

**Gelest OE™ 41.7 Low Volatility in solution**

A single component solution version in toluene which cures after evaporation of solvent in 24 ours to form optically clear films. Product must be stored <5°C.

- PP1-OE41.7: Gelest OE™ 41.7
- 100g/$85.00

**Graphic Representation**

- Plot of cross-over point and time (min.)
- G: 193.8 Pa

**Contact Information**

Gelest
(215) 547-1015  FAX: (215) 547-2484  www.gelest.com

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