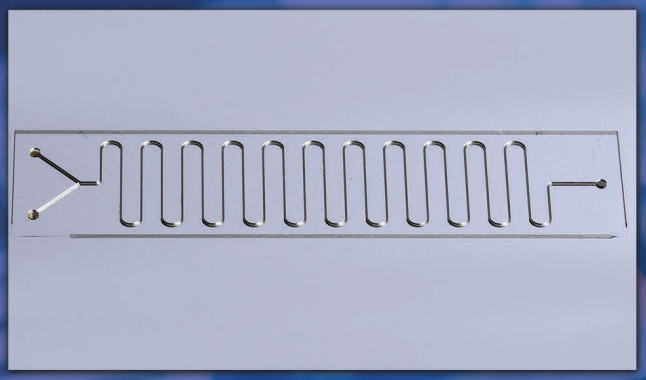
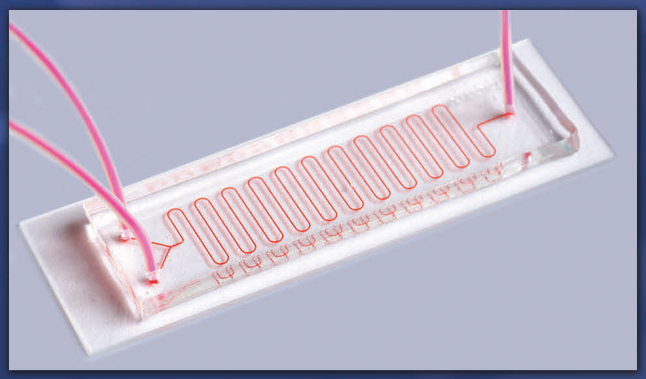
Gelest

Silicone Materials for Microfluidics



Microfluidic Master

Device Molding



Assembled Device

- **Reprographic Grade Silicones**
- **Optical Grade Silicones**
- **Silicone Elastomer Fabrication Toolkit**

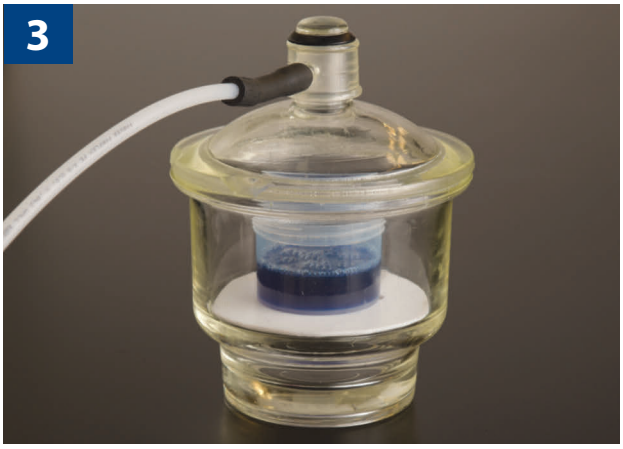
Gelest

Enabling Your Technology

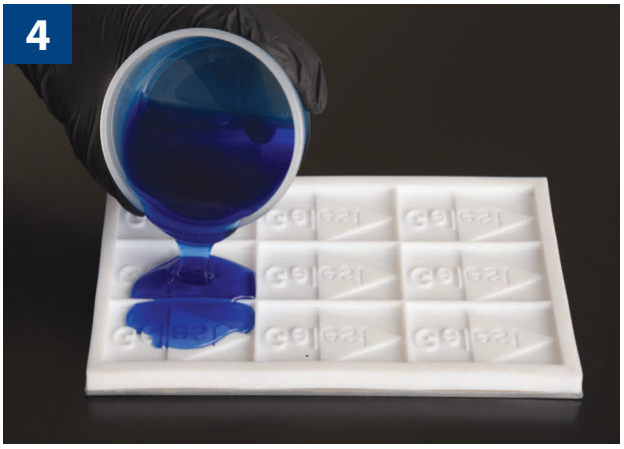
How To Use Gelest Silicones

WEIGHING: Weigh A and B in the recommended ratios. Fill container only 1/3 full to allow for foaming during Step 3.

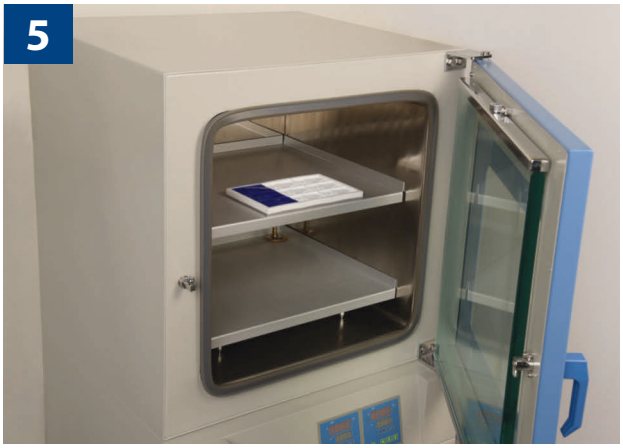
MIXING: Use a spatula to make a homogeneous mixture of A and B.



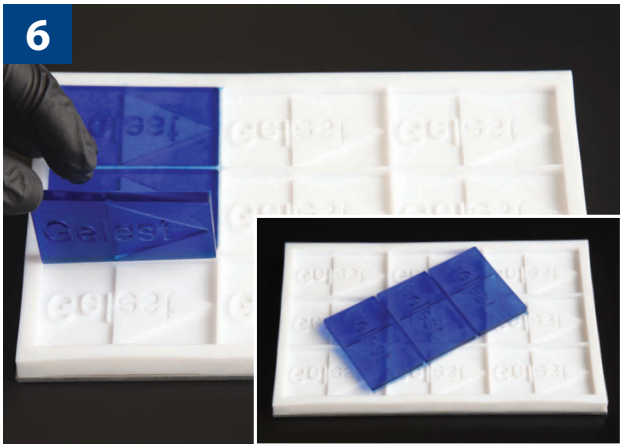
DEAIRING: Place the mixed silicone in a vacuum chamber (desiccator) and apply vacuum until foam collapes.



POURING: Pour mix into mold or form, avoid entrapment of air.



CURING: Follow the recommended cure schedule.



DEMOLDING THE FINISHED PART.

**Use of polyethylene disposable gloves recommended. Latex gloves can retard cure.*

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Reprographic Grade Silicones

Optical Grade Silicones

Silicone Elastomer Fabrication Toolkit

Microfluidic Elastomers

Gelest® RG 01 2-Part Reprographic Silicone Elastomer (10:1 kit)

Capsular Description: **Thickness** **thick** | **Cure** **Pt** **catalyst** | **Hardness** **medium** | **Type** **100% active 2-part**

Description

Gelest® RG 01 is a flexible, high definition clear molding and encapsulation compound. The moderate viscosity of the catalyzed mix and long pot-life at room temperature make this extremely versatile for a broad range of applications.

Cured Properties

Tensile Strength	5.5-7.0 MPa
Elongation	80-100%
Durometer, Shore A	45-60
Refractive Index (25°C)	1.43
Volatiles (4 hours/150°C)	1.0 wt%
Coefficient of Friction (aqueous environment, 37°C)	~1.5-2.0
Critical Surface Tension	23-24 mN/m
Tear Strength	1.75-2.60 kN/m
Specific Gravity	1.04
Contact Angle, water	105-110°

Uncured Properties of Gelest® RG 01

Viscosity (10:1) catalyzed: 3500-4500 cSt
Part A (base): 5000-5500 cSt
Part B (crosslinker): 50-75 cSt

Application Methods

Thoroughly mix Part A and Part B in a 10:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 12 hours at 25°C. Pot-life may be extended by storing at 5°C. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG01 Gelest® RG 01
100 g SpeedMixer™ kit
220 g kit (200g RG01-A, 20g RG01-B)
1.1 kg kit (1000g RG01-A, 100g RG01-B)

Application and Reference Data

1. Inglis, D. et al. *Biomicrofluidics* **2010**, *4*, 26504.

Gelest® RG 02 2-Part Oleophilic Reprographic Silicone Elastomer (10:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® RG 02 is a clear to translucent, high definition molding and encapsulation compound with greater adsorption of hydrocarbons than conventional silicones making it able to transfer a wider range of chemicals for self-assembly techniques and micro-contact printing.

Cured Properties

Tensile Strength	2.0-4.0 MPa
Elongation	80-100%
Durometer, Shore A	35-45
Refractive Index (25°C)	1.43
Dielectric Constant	2.6
Critical Surface Tension	27-29 mN/m
Tear Strength	1.75-2.10 kN/m
Specific Gravity	1.04
Contact Angle, water	110-115°
Swell (wt%)	
Toluene	**130%**
Heptane	**117%**

Standard Reprographic PDMS Swell (wt%)	
Toluene	90%
Heptane	83%

Uncured Properties of Gelest® RG 02

Viscosity (10:1) catalyzed: 3000-4000 cSt
Part A (base): 5000-5500 cSt
Part B (crosslinker): 35-75 cSt

Application Methods

Thoroughly mix Part A and Part B in a 10:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 12 hours at 25°C. Pot-life may be extended by storing at 5°C. Apply to substrate. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG02 Gelest® RG 02
100 g SpeedMixer™ kit
220 g kit (200g RG02-A, 20g RG02-B)
1.1 kg kit (1000g RG02-A, 100g RG02-B)

Gelest® RG 03 2-Part Hydrophilic Reprographic Silicone Elastomer (10:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® RG 03 is a clear to translucent, high definition molding and encapsulation compound with improved surface wettability and reduced coefficient of friction compared to conventional silicones. Microfluidic features exhibit lower hydrodynamic back-pressures.

Cured Properties

Tensile Strength	4.0-6.0 MPa
Elongation	100-200%
Durometer, Shore A	40-60
Refractive Index (25°C)	1.43
Coefficient of Friction (aqueous environment, 37°C)	**1.0-1.5**
Tear Strength	1.75-2.10 kN/m
Specific Gravity	1.04
Contact Angle, water	**85°**

Standard Reprographic PDMS	
Coefficient of Friction	≈2
Contact Angle, water	110°

Uncured Properties of Gelest® RG 03

Viscosity (10:1) catalyzed: 3000-4000 cSt
Part A (base): 3500-4500 cSt
Part B (crosslinker): 50-75 cSt

Application Methods

Thoroughly mix Part A and Part B in a 10:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 12 hours at 25°C. Pot-life may be extended by storing at 5°C. Apply to substrate. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG03 Gelest® RG 03
100 g SpeedMixer™ kit:
220 g kit (200g RG03-A, 20g RG03-B)
1.1 kg kit (1000g RG03-A, 100g RG03-B)

Application and Reference Data

1. Goff, J. et al. *MRS Proceedings* **2014**, 1626.

Gelest® RG 04 2-Part Oleophobic Reprographic Silicone Elastomer (10:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® RG 04 is a clear to translucent molding and encapsulation compound with greater resistance to swelling by hydrocarbons than conventional silicones, allowing for use of a wider range of solvents for microfluidic applications.

Cured Properties

Tensile Strength	1.5-2.0 MPa
Elongation	150-200%
Durometer, Shore A	25-30
Refractive Index (25°C)	1.39
Specific Gravity	1.36
Contact Angle, water	110°
Contact Angle, hexadecane	45°
Swell (wt%)	
Toluene	**7%**
Heptane	**2%**

Standard Reprographic PDMS Swell (wt%)	
Toluene	90%
Heptane	83%

Uncured Properties of Gelest® RG 04

Viscosity	(10:1) catalyzed: 30,000-35,000 cSt
	Part A (base): 65,000-70,000 cSt
	Part B (crosslinker): 800-1200 cSt

Application Methods

Thoroughly mix Part A with Part B in a 10:1 ratio. (Due to the high viscosity of this system, the mixing step is not as facile as standard PDMS elastomers.) De-air mix under vacuum for about 30 minutes. The pot-life is 6 hours at 25°C. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 80°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-RG04 Gelest® RG 04
100 g SpeedMixer™ kit
220 g kit (200g RG04-A, 20g RG04-B)
1.1 kg kit (1000g RG04-A, 100g RG04-B)

Gelest® RG 05 2-Part Low Volatile Content Reprographic Silicone Elastomer (10:1 kit)

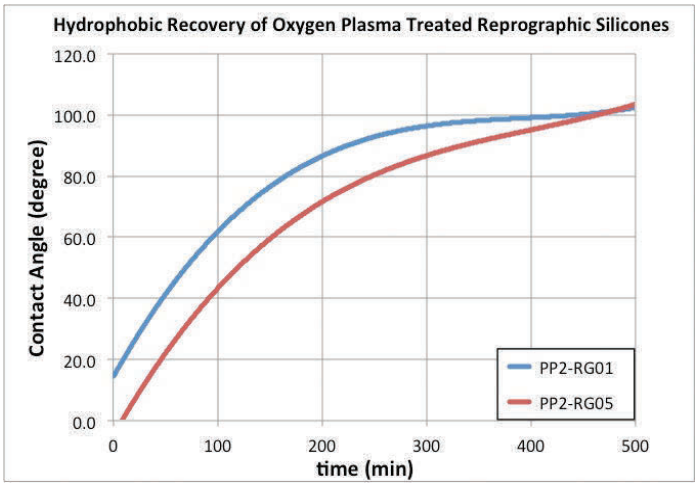
Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® RG 05 is a flexible, clear, high definition molding and encapsulation compound with low volatile content and greater dimensional stability. This low volatility formulation offers lower extractables and reduces the rate of hydrophobic recovery, providing improved performance in micro-electronic and medical applications. The low volatile content allows for a greater window for long-term surface treatments.

Cured Properties

Tensile Strength	5.5-7.0 MPa
Elongation	80-100%
Durometer, Shore A	45-60
Refractive Index (25°C)	1.43
Volatiles (4 hours/150°C)	**≤0.2 wt%**
Dielectric Constant	2.7
Critical Surface Tension	23-24 mN/m
Tear Strength	1.75-2.60 kN/m
Specific Gravity	1.04
Contact Angle, water	105-110°



Uncured Properties of Gelest® RG 05

Viscosity	(10:1) catalyzed: 3500-5000 cSt
	Part A (base): 5000-6000 cSt
	Part B (crosslinker): 50-75 cSt

Standard Reprographic PDMS
Volatiles (4 hours/150°C) ≥ 1.0 wt%

Application Methods

Thoroughly mix Part A and Part B in a 10:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 12 hours at 25°C. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG05 Gelest® RG 05
100 g SpeedMixer™ kit
220 g kit (200g RG05-A, 20g RG05-B)
1.1 kg kit (1000g RG05-A, 100g RG05-B)

Gelest® cPDMS 2-Part Overcoatable Reprographic Silicone Elastomer (10:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® cPDMS is an overcoatable clear molding and encapsulation compound which allows for multilayer fabrication. The moderate viscosity of the catalyzed mix and long pot-life at room temperature make this extremely useful in microcontact printing, prototype and small production run applications.

Cured Properties

Tensile Strength	6.0-7.0 MPa
Elongation	100-200%
Durometer, Shore A	40-50
Refractive Index (25°C)	1.41
Dielectric Constant	2.7
Specific Gravity	1.02

Uncured Properties of Gelest® cPDMS

Viscosity	(10:1) catalyzed: 3500-4500 cSt
	Part A (base): 4000-5000 cSt
	Part B (crosslinker): 500-750 cSt

Application Methods

Thoroughly mix Part A and Part B in a 10:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 4 hours at 25°C. Avoid entrapping air. Cure at 80°C for 1 hour or at room temperature for 24 hours. Overcoating should be done within 24 hours in all cases. Use standard cure conditions for overcoating. Final cure should be twice the time of the initial cure.

Standard Packaging

PP2-RG06 Gelest® cPDMS
100 g SpeedMixer™ kit
220 g kit (200g RG06-A, 20g RG06-B)
1.1 kg kit (1000g RG06-A, 100g RG06-B)

Gelest® hPDMS 2-Part High Modulus Reprographic Silicone Elastomer (1:1 kit)

Capsular Description: **Thickness** **thick** **Cure** **Pt** **catalyst** **Hardness** **medium-high** **Type** **100% active 2-part**

Description

Gelest® hPDMS is a clear molding and encapsulation compound with a higher modulus than conventional silicones. This 'hard' PDMS addresses the issues of compliant PDMS in soft lithography applications.

Cured Properties

Tensile Strength	0.5-0.75 MPa
Elongation	30-40%
Durometer, Shore A	**60-70**
Refractive Index (25°C)	1.41
Specific Gravity	0.98

Uncured Properties of Gelest® hPDMS

Viscosity (1:1) catalyzed: 500-750 cSt
Part A (base): 800-1200 cSt
Part B (crosslinker): 150-300 cSt

Application Methods

Thoroughly mix Part A and Part B in a 1:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 4 hours at 25°C. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 24 hours. Care is required in demolding this material. Mechanical penetration of the cured elastomer may compromise integrity of material; device access ports should be included in the master mold design.

Standard Packaging

PP2-RG07 Gelest® hPDMS
100 g SpeedMixer™ kit
1 kg kit (500g RG07-A, 500g RG07-B)

Application and Reference Data

1. Schmid, H. et al. *Macromolecules* **2000**, *33,* 3042.
2. Odom, T. et al. *Langmuir* **2002**, *18*, 5314.

Gelest® sPDMS 2-Part Spin-Coatable Reprographic Silicone Elastomer (100:1 kit)

Capsular Description: **Thickness** **thin** | **Cure** **Pt** **catalyst** | **Hardness** **medium** | **Type** **100% active 2-part**

Description

Gelest® sPDMS is a spin-coatable, flexible, clear molding and encapsulation compound. This dilute formulation allows for spin-coating of Gelest® RG 01 thin films onto a substrate.

Solution Properties

Solids	8-12 wt%
Flashpoint	-4°C
Specific Gravity	0.71
Viscosity	1.0-2.0 cSt

Cured Properties

Tensile Strength	5.5-7.0 MPa
Elongation	80-100%
Durometer, Shore A	45-60
Refractive Index (25°C)	1.43
Dielectric Constant	2.7
Critical Surface Tension	23-24 mN/m
Tear Strength	1.75-2.60 kN/m
Contact Angle, water	105-110°

Uncured Properties of Gelest® sPDMS

Viscosity	(100:1) catalyzed: 1.0-2.0 cSt
	Part A (base): 1.0-2.0 cSt
	Part B (crosslinker): 50-75 cSt

Application Methods

Thoroughly mix Part A and Part B in a 100:1 ratio. The pot-life is 12 hours at 25°C. Recommended spin-coating speed is 1000-2000 rpm to achieve PDMS thin films with sub-micron thickness. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG08 Gelest® sPDMS
1.01 kg kit (1000g RG08-A, 10g RG08-B)

Gelest® xPDMS 2-Part High Elongation Reprographic Silicone Elastomer (100:1 kit)

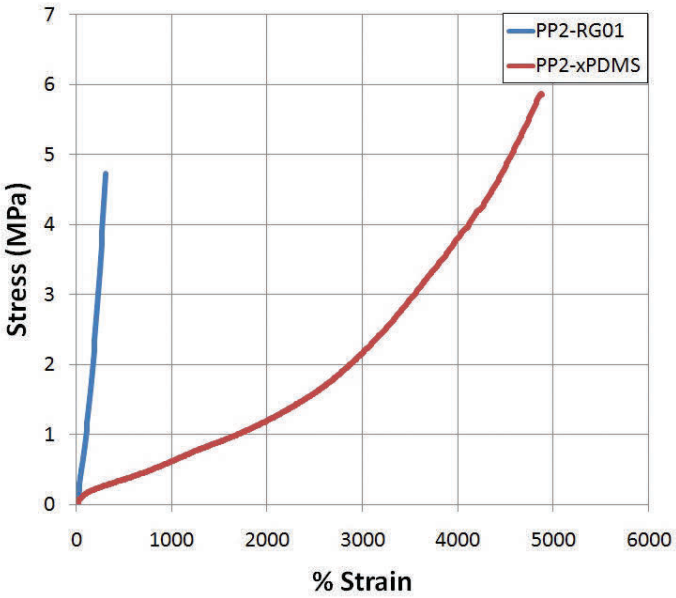
Capsular Description: **Thickness** **thick** | **Cure** **Pt** **catalyst** | **Hardness** **low** | **Type** **100% active 2-part**

Description

Gelest® xPDMS is a flexible, translucent molding and encapsulation compound with significantly higher elongation than conventional silicones. Gelest® xPDMS also has a greater amount of self-sealing compared to conventional silicone RTVs, allowing for mechanical penetration of cannulae and optical fibers as well as electroactive interconnects.

Cured Properties

Tensile Strength	6.0-7.0 MPa
Elongation	**4000-6000%**
Durometer, Shore A	10-15
Refractive Index (25°C)	1.41
Volatiles (4 hours/150°C)	**≤0.1 wt%**
Critical Surface Tension	23-24 mN/m
Specific Gravity	1.12
Contact Angle, water	105-110°
Tear Strength	40.0-42.0 kN/m
Elongation @ Tear	2000%



Uncured Properties of Gelest® xPDMS

Viscosity (100:1) catalyzed: 12,000-14,000 cSt
Part A (base): 12,000-14,000 cSt
Part B (crosslinker): 800-1000 cSt

Application Methods

Thoroughly mix Part A and Part B in a 100:1 ratio. Try to avoid introducing bubbles. For critical applications, de-air mix under vacuum for about 20 minutes. The pot-life is 24 hours at 25°C. Avoid entrapping air during transfer and casting. Cure at 80°C for 4 hours or at room temperature for 36 hours.

Standard Packaging

PP2-RG09 Gelest® xPDMS
202 g kit (200g RG09-A, 2g RG09-B)
1.01 kg kit (1000g RG09-A, 10g RG09-B)

Application and Reference Data

1. Goff, J. et al. *Polymer Preprints* **2012**, *53(1),* 486.
2. Goff, J. et al. *Advanced Materials* **2016**, *28(12),* 2393-2398.

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Gelest® OE 41 1.41 Refractive Index 2-Part Silicone RTV Encapsulant (1:1 kit)

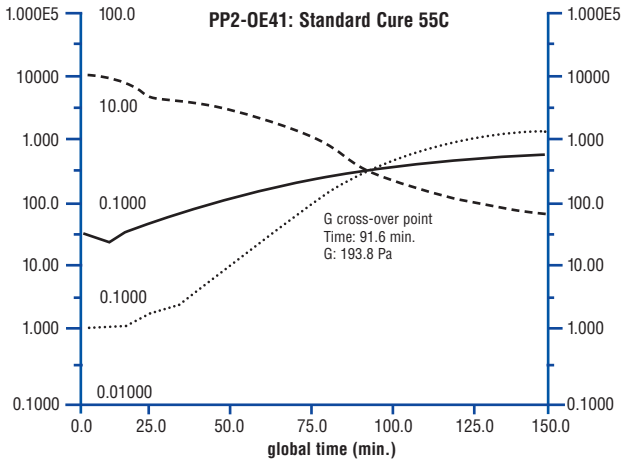
Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

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 (25°C)	1.41
Tensile Strength	>2.0 MPa
Elongation	140-200%
Durometer, Shore A	15-30
Tear Strength	0.90-2.60 kN/m



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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE41 Gelest® OE 41
1 kg kit (500g OE41-A, 500g OE41-B)
6 kg kit (3000g OE41-A, 3000g OE41-B)

Application and Reference Data

1. Lien, V. et al. *IEEE Photon. Technol. Lett.* **2004**, *16(6),* 1525.
2. Jeong, J. et al. *Organic Electronics* **2011**, *12,* 2095.

Gelest® OE 42 1.42 Refractive Index 2-Part Silicone RTV Encapsulant (1:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	medium	100% active 2-part

Description

Gelest® OE 42 is a flexible, optically clear molding, encapsulation and coating compound, offering improved adhesion to substrates compared to Gelest® OE 41. 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 (25°C)	1.42
Tensile Strength	>1.5 MPa
Elongation	90-150%
Durometer, Shore A	10-25
Tear Strength	0.90-1.75 kN/m

Uncured Properties of Gelest® OE 42

Viscosity (1:1) catalyzed: 1500-2000 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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE42 Gelest® OE 42
1 kg kit (500g OE42-A, 500g OE42-B)
6 kg kit (3000g OE42-A, 3000g OE42-B)

Gelest® OE 43 1.43 Refractive Index 2-Part Silicone RTV Encapsulant (1:1 kit)

Capsular Description: **Thickness** **thick** **Cure** **Pt** **catalyst** **Hardness** **low** **Type** **100% active 2-part**

Description

Gelest® OE 43 is a flexible, optically clear molding, encapsulation and coating compound, offering improved adhesion to substrates compared to Gelest® OE 41. 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 (25°C)	1.43
Tensile Strength	>1.5 MPa
Elongation	75-100%
Durometer, Shore A	5-15
Tear Strength	0.90-1.75 kN/m

Uncured Properties of Gelest® OE 43

Viscosity (1:1) catalyzed: 800-1500 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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE43 Gelest® OE 43
1 kg kit (500g OE43-A, 500g OE43-B)
6 kg kit (3000g OE43-A, 3000g OE43-B)

Application and Reference Data

Employed in microfluidics waveguides.

1. Kee, J. et al. *Optics Express* **2009**, *17(14),* 11739.

Gelest® OE 46 1.46 Refractive Index 2-Part Silicone RTV Encapsulant (1:1 kit)

Capsular Description:	Thickness	Cure	Hardness	Type
	thick	Pt catalyst	low	100% active 2-part

Description

Gelest® OE 46 is a flexible, optically clear molding, encapsulation and coating compound. Refractive index of Gelest® OE 46 matches glass, allowing for fabrication with 'invisible' joints. 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 (25°C)	1.46
Tensile Strength	0.25 MPa
Elongation	50%
Durometer, Shore A	10-20
Specific Gravity	1.05

Uncured Properties of Gelest® OE 46

Viscosity (1:1) catalyzed: 1500-2500 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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE46 Gelest® OE 46
200 g kit (100g OE46-A, 100g OE46-B)
1 kg kit (500g OE46-A, 500g OE46-B)

Gelest® OE 46.1 1.46 Refractive Index 2-Part Silicone RTV Encapsulant, Medium Strength (1:1 kit)

Capsular Description: **Thickness** **thick** **Cure** **Pt** **catalyst** **Hardness** **medium** **Type** **100% active 2-part**

Description

Gelest® OE 46.1 is a flexible, optically clear molding, encapsulation and coating compound. Refractive index of Gelest® OE 46.1 matches glass, allowing for fabrication with 'invisible' joints. The 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 (25°C)	1.46
Tensile Strength	0.55 MPa
Elongation	65-75%
Durometer, Shore A	34-45
Specific Gravity	1.19

Uncured Properties of Gelest® OE 46.1

Viscosity (1:1) catalyzed: 15,000 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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE46.1 Gelest® OE 46.1
200 g kit (100g OE46.1-A, 100g OE46.1-B)
1 kg kit (500g OE46.1-A, 500g OE46.1-B)

Gelest® OE 46.2 1.46 Refractive Index 2-Part Silicone RTV Encapsulant, High Strength (1:1 kit)

Capsular Description: **Thickness** **thick** **Cure** **Pt** **catalyst** **Hardness** **medium** **Type** **100% active 2-part**

Description

Gelest® OE 46.2 is a flexible, optically clear molding, encapsulation and coating compound. Refractive index of Gelest® OE 46.2 matches glass, allowing for fabrication with 'invisible' joints. The 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 (25°C)	1.46
Tensile Strength	1-1.5 MPa
Elongation	200-250%
Durometer, Shore A	45-50
Specific Gravity	1.22

Uncured Properties of Gelest® OE 46.1

Viscosity (1:1) catalyzed: 30,000 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. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE46.2 Gelest® OE 46.2
200 g kit (100g OE46.2-A, 100g OE46.2-B)
1 kg kit (500g OE46.2-A, 500g OE46.2-B)

Gelest® OE 50 1.50 Refractive Index 2-Part Silicone RTV Encapsulant (1:1 kit)

Capsular Description: **Thickness** **thick** **Cure** **Pt** **catalyst** **Hardness** **low** **Type** **100% active 2-part**

Description

Gelest® OE 50 is a flexible, optically clear molding, encapsulation and coating compound. The higher refractive index of Gelest® OE 50 can act as cladding in optical waveguide applications. 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 (25°C)	1.50
Tensile Strength	0.1 MPa
Elongation	75-100%
Durometer, Shore A	10-20
Specific Gravity	1.07

Uncured Properties of Gelest® OE 50

Viscosity (1:1) catalyzed: 3000-5000 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 12 hours at 25°C. Pot-life may be extended by storing at 5°C. Pour into mold or apply to substrate. Avoid entrapping air. Cure at 55°C for 4 hours or at room temperature for 72 hours.

Standard Packaging

PP2-OE50 Gelest® OE 50
200 g kit (100g OE50-A, 100g OE50-B)
1 kg kit (500g OE50-A, 500g OE50-B)

UtenSil® Primer P1

Adhesive/Primer for Reprographic Grade Silicones

Description

UtenSil® Primer P1 enhances the adhesion of reprographic silicones to a desired substrate.

Solution Properties

Form	clear, colorless
Solids	5-10 wt%
Flashpoint	-4°C
Specific Gravity	0.70
Viscosity	1.0-2.0 cSt

Shelf life

12 months when stored below 25°C in sealed containers. Keep container sealed after dispensing product.

Application Methods

UtenSil® Primer P1 is applied as a coating by spraying, dipping or brushing. The solvent is removed by evaporation in an exhausted area. Moisture induced crosslinking occurs at room temperature over 1-2 hours at 35-85% relative humidity.

Standard Packaging

PP1-USP1 UtenSil® Primer P1
100 g
1 kg

UtenSil® Bonding Agent B1

Bonding Agent for Reprographic Grade Silicones

Description

UtenSil® Bonding Agent B1 binds reprographic silicone surfaces together irreversibly.

Solution Properties

Form	opaque, white*
Solids	5-10 wt%
Flashpoint	-1°C
Specific Gravity	0.78
Viscosity	2.0-3.0 cSt

**Turns clear after deactivation.*

Shelf life

6 months when stored below 25°C in sealed containers. Keep container sealed after dispensing product.

Application Methods

UtenSil® Bonding Agent B1 is applied by spraying, dipping or brushing. The solvent is removed by evaporation in an exhausted area. Bonding of silicone surfaces occurs at 80°C over 4 hours. After bonding is complete the process is deactivated by heating to 140°C for 4 hours in a exhausted area. An amine odor is generated during the deactivation step.

Standard Packaging

PP1-USB1 UtenSil® Bonding Agent B1
100 g
1 kg

UtenSil® Wetting Agent W1

Hydrophilic Modification Solution for Reprographic Grade Silicones

Description

UtenSil® Wetting Agent W1 increases the wettability of reprographic silicone surfaces.

Solution Properties

Form	clear, colorless
Solids	5-7 wt%
Flashpoint	6°C
Specific Gravity	0.88
Viscosity	1.0-2.0 cSt
Contact Angle, water (1mm thickness)	20°

Shelf life

12 months when stored below 25°C in sealed containers. Keep container sealed after dispensing product.

Application Methods

Immerse oxygen plasma treated reprographic silicone into UtenSil® Wetting Agent W1 for 1 hour. (Reprographic silicones with a thickness >1mm may require longer immersion time in UtenSil® Solution.) Dip the silicone into ethanol to remove excess material. Cure wetting agent on silicone surface at 100°C over 2 hours.

Standard Packaging

PP1-USW1 UtenSil® Wetting Agent W1
100 g
1 kg

UtenSil® Dissolution Agent D1

Digestion Solution for Reprographic Grade Silicones

Description

UtenSil® Dissolution Agent D1 is a cleaning solvent that chemically reacts and dissolves silicones.

Solution Properties

Form	amber-light brown
Solids	20-30 wt%
Flashpoint	93°C
Specific Gravity	0.85
Viscosity	5-10 cSt

Shelf life

12 months when stored below 25°C in sealed containers. Keep container sealed after dispensing product.

Application Methods

Place silicone to be dissolved in a stainless steel or glass container which may be covered to reduce evaporation. Remove any water on the silicone by physical drying or heating in an oven. Immerse silicone in UtenSil® Dissolution Agent D1 solution at room temperature. Dissolution time depends on the type of silicone, thickness and surface area. A typical silicone with a 5 mm section thickness will dissolve in 4-8 hours. Dissolution can be accelerated by warming to 35-50°C. Spot dissolution can be achieved by deposition of Dissolution Agent D1 with a pipette and removing the dissolved material with a pipette, followed by a brief acetone and water rinse.

Standard Packaging

PP1-USD1 UtenSil® Dissolution Agent D1
100 g
1 kg

UtenSil® Cure Retarder R1

Cure Moderator Solution for Reprographic Grade Silicones

Description

UtenSil® Cure Retarder R1 moderates the cure rate of vinyl-addition (platinum) cure silicones.

Solution Properties

Form	clear, colorless
Flashpoint	112°C
Specific Gravity	0.98
Viscosity	300-500 cSt

Shelf life

12 months when stored below 25°C in sealed containers. Keep container sealed after dispensing product.

Application Methods

UtenSil® Cure Retarder R1 is mixed with Part A of a 2-Part silicone RTV encapsulant formulation prior to throughly mixing with Part B. Increased concentrations of UtenSil® Cure Retarder R1 solution in Part A will increase the pot-life of the formulation at room temperature and slow the rate of the vinyl-addition (platinum) cure at elevated temperatures. In an exemplary procedure, mixing 1wt% UtenSil® Cure Retarder R1 solution with Part A of PP2-OE41 will increase the pot-life of the catalyzed mixture from 18 hours to 48 hours at room temperature. Performance of UtenSil® Cure Retarder R1 may differ between RTV formulations depending on platinum concentration.

Standard Packaging

PP1-USR1 UtenSil® Cure Retarder R1
100 g
1 kg

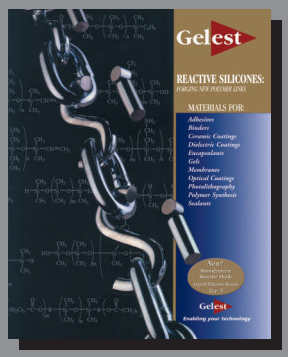
Gelest

Silicon Compounds: Silanes and Silicones

Detailed chemical properties and reference articles for over 3,000 compounds. The 600 page handbook of silane and silicone chemistry includes scholarly reviews as well as detailed application information.

Optical Materials

This 24 page brochure showcases a wide range of optical materials. Product offerings include optical grade silicone encapsulants with refractive indices ranging from 1.39 to 1.50, optical grade hard resin coatings with refractive indices ranging from 1.55-1.64, refractive index matching fluids, and UV-active/Fluorescent molecular coatings.



Reactive Silicones: Forging New Polymer Links

The 64 page brochure describes reactive silicones that can be formulated into coatings, membranes, cured rubbers and adhesives for mechanical, optical, electronic and ceramic applications. Information on reactions and cures of silicones as well as physical properties shortens product development time for chemists and engineers.

Silicone Fluids: Stable Inert Media

Design and Engineering properties for conventional silicone fluids as well as thermal, fluorosilicone, hydrophilic and low temperature grades are presented in a 24 page selection guide. The brochure provides data on thermal, rheological, electrical, mechanical and optical properties for silicones. Silicone fluids are available in viscosities ranging from 0.65 to 2,500,000 cSt.

Hydrophobicity, Hydrophilicity and Silane Surface Modification

Organosilanes are used extensively for modification of surface properties. This 80-page brochure describes silane surface modification with an emphasis on making surfaces hydrophobic or hydrophilic.

Gelest

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