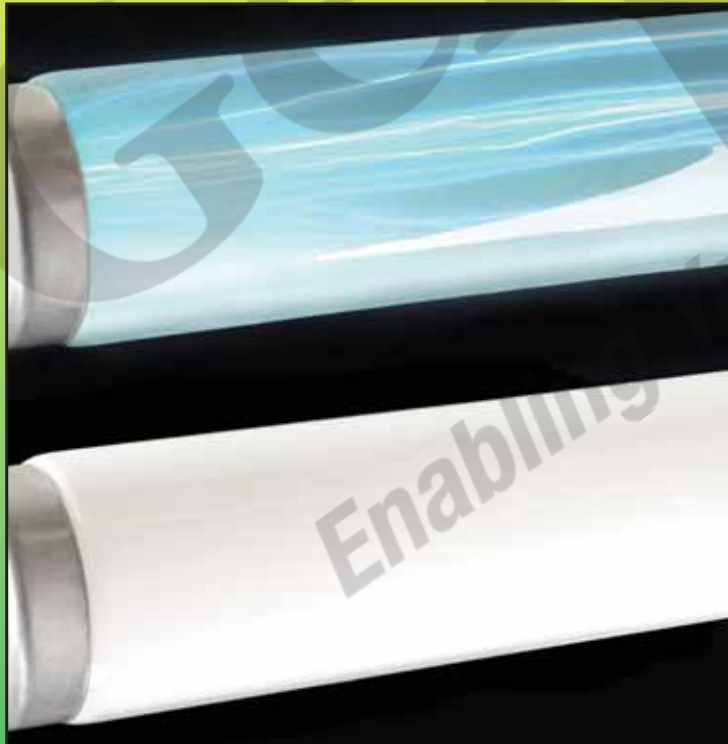


Gelest

Pt

OPTICAL MATERIALS



*Molecular and Thin
Film Coatings*

*Thick Film Coatings
for Thermal,
Mechanical and
Optical Properties*

Clear Gels

Clear Encapsulants

*High Strength
Encapsulants*

Pt

Gelest

Enabling Your Technology



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Sales of all products listed are subject to the published terms and conditions of Gelest, Inc.



OPTICAL MATERIALS

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Gelest, Inc. has broad expertise in silane, silicone and metal-organic technology.

Gelest products find applications in:

Advanced Ceramics
Adhesives and Sealants
Chemical Vapor Deposition
Coupling Agents and Composites
Conductive Coatings
Metallization
Microelectronics
Optical Coatings

Photolithography
Polymer Synthesis
Self-Assembled Monolayers
Separation Science
Solid State Ionics
Superconductors
Synthetic Organic Chemistry
UV-EB Coatings

Gelest, Inc. provides a full range of manufacturing services for support of its product lines, including:

Custom Synthesis
Bulk Manufacturing

Further information on the following subjects is available upon request.

Group IV Organometallics
Silicon
Germanium
Tin
Lead

Metal Alkoxides
Metal Diketonates
Metal-Organic Monomers
Silicon-Based Blocking Agents
Silicon-Based Reducing Agents
Silane Coupling Agents

Silicones
Reactive Silicones
Inert Silicones

Performance Products
Coatings
Impregnants
Gels

Hydrophobic Treatments For Glass and Ceramics

Features: Provides water-repellent silicone, molecular films with high durability for glass and vitreous surfaces. Acidic byproducts remove surface alkali from soda-lime glass substrates.





Applications:

laboratory glassware- improves drainage, reduce breakage.

optical fibers- reduces moisture adsorption and surface fracture.

clinical analysis- reduces protein and lipid adsorption. (Not for food or drug use.)

glass plate and glazing- provides high water contact angle, facilitate forced air blow-off.

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 low	Type	 100% active 1-part
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Aquaphobe® CM chlorinated polydimethylsiloxane

Description

Aquaphobe® CM is a chlorine terminated polydimethylsiloxane oligomer. The chlorines react with hydroxy and silanol groups of glass, siliceous surfaces and other metal oxide surfaces to form a chemically bound polydimethylsiloxane “siliconized” surface.

Properties of Treated Surfaces

(Values reported are for glass slides dipped in 1% solutions of Aquaphobe® CM and cured at 100°C.)

critical surface tension

untreated	$\gamma_c = 78$ dynes/cm
treated (hydrophobic)	$\gamma_c = 25$ dynes/cm

Typical Properties of Aquaphobe™ CM

% active	100%
flashpoint	15°C
specific gravity	0.99-1.01
viscosity	3-6 cSt.

Standard Packaging

PP1-AQCM Aquaphobe® CM
100g/\$26.00
1kg/\$196.00
18kg/commercial package

Cautions

Aquaphobe® is a mixture of corrosive chlorinated polysiloxanes. Avoid skin and eye contact. Use in a well ventilated area. Wear gloves and safety glasses.

Application Methods

1. Aquaphobe® coatings are most frequently applied as a 2-10% solution in dry solvents such as hexane, methylene chloride or toluene. Articles are dipped or wiped. Articles can be cured by air drying for 24 hours at conditions of <75% relative humidity. Heat curing at 110°C for 15-20 minutes in an exhausted oven provides the most effective surface treatment.

2. A master batch of Aquaphobe® in isopropanol or ethanol is desirable when large areas are to be treated and the acidic byproducts are difficult to handle. A 0.5-2.0% solution in isopropanol is prepared in a well-ventilated area. Hydrogen chloride fumes issue during this stage. Acidic character is reduced for subsequent surface treatment.

Over treatment results in a cloudy surface. The concentration should be reduced to eliminate this effect.

Hydrophobic and Oleophobic Treatments For Glass and Ceramics

Features: Provides water-repellent silicone, fluorinated silicone molecular films with high durability for glass and vitreous surfaces. Acidic byproducts remove surface alkali from soda-lime glass substrates.





Applications:

microcontact printing- provides durable release films for photocurable resins.

optical fibers- reduces moisture adsorption and surface fracture.

clinical analysis- reduces protein and lipid adsorption. (Not for food or drug use.)

glass plate and glazing- provides high water contact angle, facilitate forced air blow-off.

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 low	Type	 100% active 1-part
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Aquaphobe® CF chlorinated fluoroalkylmethylsiloxane

Description

Aquaphobe® CF is a chlorine terminated polyfluoroalkyl-methylsiloxane oligomer. The chlorines react with hydroxy and silanol groups of glass, siliceous surfaces and other metal oxide surfaces to form a chemically bound, low surface energy, fluorinated silicone surface.

Properties of Treated Surfaces

(Values reported are for glass slides dipped in 1% solutions of Aquaphobe® CF and cured at 100°C.)

critical surface tension

untreated	$\gamma_c = 78$ dynes/cm
treated (hydrophobic)	$\gamma_c = 16-19$ dynes/cm

Typical Properties of Aquaphobe® CF

% active	100%
flashpoint	65°C
specific gravity	1.40-1.43
refractive index	1.358
viscosity	6-10 cSt.

Reference:

J. Taniguchi et al, Jpn. Soc. Appl. Phys., 41, 4194, Part 1, No. 6B, 2002

Standard Packaging

PP1-AQCF	Aquaphobe® CF
	25g/\$82.00
	100g/\$266.00

Cautions

Aquaphobe® is a mixture of corrosive chlorinated polysiloxanes. Avoid skin and eye contact. Use in a well ventilated area. Wear gloves and safety glasses.

Application Methods

1. Aquaphobe® coatings are most frequently applied as a 2-10% solution in dry solvents such as hexane, methylene chloride or toluene. Articles are dipped or wiped. Articles can be cured by air drying for 24 hours at conditions of <75% relative humidity. Heat curing at 110°C for 15-20 minutes in an exhausted oven provides the most effective surface treatment.
2. A master batch of Aquaphobe® in isopropanol or ethanol is desirable when large areas are to be treated and the acidic byproducts are difficult to handle. A 0.5-2.0% solution in isopropanol is prepared in a well-ventilated area. Hydrogen chloride fumes issue during this stage. Acidic character is reduced for subsequent surface treatment.

Over treatment results in a cloudy surface. The concentration should be reduced to eliminate this effect.



Hydrophobic Water-Dispersible Coatings For Glass and Ceramics

Features: Provides water-repellency, lubricity, surface resistivity to glass and vitreous surfaces.

Applications:





laboratory glassware - improves drainage, reduces breakage.

optical fibers - provides lubricity and reduces breakage during fabrication and operational flexing.

clinical analysis - decreases protein adsorption of analytical and diagnostic equipment, decreases hemolysis and increases clotting time of blood. Glassclad®18 is not for food or drug use.

fluorescent light bulbs - increases scratch resistance, reducing breakage, increases surface resistivity.

porcelain ware - provides a glide surface and reduces adhesion to other porcelain ware.

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 low	Type	 solvent-borne 1-part
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Glassclad®18 Hydrophobic Coating

Description

Glassclad®18 is a monomeric octadecylsilane derivative in a mixture of t-butanol and diacetone alcohol that reacts with water to form a silanol-rich prepolymer. The silanol-rich prepolymer condenses with available hydroxyl groups of siliceous substrates to form a chemically bound alkylsilicone.

Properties of Treated Surfaces

Values reported are for glass slides dipped in 1% solutions of Glassclad®18 and cured 5 minutes at 100°C.

Critical Surface Tension

untreated $\gamma_c = 78$ dynes/cm
treated (hydrophobic) $\gamma_c = 31$ dynes/cm

Surface Resistivity

untreated 1×10^{12} ohms
treated 1.2×10^{13} ohms

Coefficient of Friction, Static (glass slide on glass slide)

untreated 0.9-1.0
treated 0.2-0.3

Blood Protein Adsorption

(comparative 100 hour adsorption value for whole human blood on borosilicate glass surfaces)

untreated 0.13mg/mm²
treated 0.01-0.02mg/mm²

Solution Properties of Glassclad®18

solids 20%
color, gardner scale 8
specific gravity 0.88
flashpoint 10°C
viscosity 8-20 cSt.

Reference:

B. Arkles et al in "Silanes, Surfaces, Interfaces" D. Leyden ed, Gordon & Breach, 1986, p91.

Shelf Life of Glassclad®18

The shelf life of Glassclad®18 is six months in sealed containers. The product is normally hazy. A small amount of precipitate does not affect the performance of the solution.

Standard Packaging

PPI-GC18 Glassclad®18
100g/\$19.00
1.5kg/\$148.00
15kg/commercial package
180kg/commercial package

Application Methods

Glassclad®18 is most frequently used as a dilute aqueous dispersion containing 0.1-1.0% of reactive silane. A 0.2% solution of active chemical can be easily prepared by adding one part by weight of the product as supplied to 99 parts of water while stirring. The following treatment method is frequently employed.

1. Thoroughly clean objects with an alkaline detergent. Used or old glass surfaces may require immersion in 2-3% sodium hydroxide. All detergent and alkali should be removed with a final rinse.
2. Prepare a 1% solution of Glassclad®18 in water. Ordinary tap water is acceptable. "Hard water" or "fluoridated water," is not acceptable.
3. Immerse the glass or vitreous surface in the solution for 5-10 seconds, ensuring that all surfaces are wetted by the solution. Agitation of the solution or the object generally results in more uniform deposition. After immersion, remove the part and gently but thoroughly rinse with water to remove excess Glassclad®18 from the surface.
4. Cure Glassclad®18 by bringing surface temperature to 100°C for 3-5 minutes. Room temperature cure may be accomplished by air drying for 24 hours if relative humidity is 65% or less.

Each liter of solution will coat approximately 80 one liter beakers, 600 15cm test tubes, or approximately 250 m² of surface.

Stability of Glassclad®18 Solutions

Aqueous solutions are not stable and will turn cloudy and precipitate after standing for several days. The solution stability can be optimized by adjusting pH to 4.5-5.



Hydrophobic Water-Dispersible Coatings For Glass and Ceramics

Features: Provides water-repellency, lubricity, surface resistivity to glass and vitreous surfaces.

Applications:





semiconductor substrates - provides hydrophobic anti-stiction coatings for silicon.

laboratory glassware - improves drainage, reduces breakage.

optical fibers - provides lubricity and reduces breakage during fabrication and operational flexing.

clinical analysis - decreases protein adsorption of analytical and diagnostic equipment
decreases hemolysis and increases clotting time of blood. Siliclad® is not for food or drug use.

porcelain ware - provides a glide surface and reduces adhesion to other porcelain ware.

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 low	Type	 solvent-borne 1-part
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Siliclad® Hydrophobic Coating

Description

Siliclad® is a monomeric octadecylsilane derivative in a mixture of tertiary alcohols and diacetone alcohol that reacts with water to form a silanol-rich prepolymer. The silanol-rich prepolymer condenses with available hydroxyl groups of siliceous substrates to form a chemically bound alkylsilicone.

Properties of Treated Surfaces

Values reported are for glass slides dipped in 1% solutions of Siliclad® and cured 5 minutes at 100°C.

Critical Surface Tension

untreated	$\gamma_c = 78$ dynes/cm
treated (hydrophobic)	$\gamma_c = 31$ dynes/cm

Surface Resistivity

untreated	1×10^{12} ohms
treated	1.2×10^{13} ohms

Coefficient of Friction, Static (glass slide on glass slide)

untreated	0.9-1.0
treated	0.2-0.3

Blood Protein Adsorption

(comparative 100 hour adsorption value for whole human blood on borosilicate glass surfaces)

untreated	0.13mg/mm ²
treated	0.01-0.02mg/mm ²

Solution Properties of Siliclad®

solids	20%
color, gardner scale	7
specific gravity	0.88
flashpoint	27°C
viscosity	8-20 cSt.

Reference:

A. Almanza-Workman et al, J. Electrochem. Soc., 149, H6, 2002.

Shelf Life of Siliclad®

The shelf life of Siliclad® is six months in sealed containers. The product is normally hazy. A small amount of precipitate does not affect the performance of the solution.

Standard Packaging

SIS6952.0 Siliclad®

100g/\$20.00
1.5kg/\$172.00
15kg/commercial package

Application Methods

Siliclad® is most frequently used as a dilute aqueous dispersion containing 0.1-1.0% of reactive silane. A 0.2% solution of active chemical can be easily prepared by adding one part by weight of the product as supplied to 99 parts of water while stirring. The following treatment method is frequently employed.

1. Thoroughly clean objects with an alkaline detergent. Used or old glass surfaces may require immersion in 2-3% sodium hydroxide. All detergent and alkali should be removed with a final rinse.
2. Prepare a 1% solution of Siliclad® in water. Ordinary tap water is acceptable. "Hard water" or "fluoridated water," is not acceptable.
3. Immerse the glass or vitreous surface in the solution for 5-10 seconds, ensuring that all surfaces are wetted by the solution. Agitation of the solution or the object generally results in more uniform deposition. After immersion, remove the part and gently but thoroughly rinse with water to remove excess Siliclad® from the surface.
4. Cure Siliclad® by bringing surface temperature to 100°C for 3-5 minutes. Room temperature cure may be accomplished by air drying for 24 hours if relative humidity is 65% or less.

Each liter of solution will coat approximately 80 one liter beakers, 600 15cm test tubes, or approximately 250 m² of surface.

Stability of Siliclad® Solutions

Aqueous solutions are not stable and will turn cloudy and precipitate after standing for several days. The solution stability can be optimized by adjusting pH to 4.5-5.

Siliglide™ 10

Release and Slip Coating For Glass, Ceramics and Nonferrous Metals





Features: Provides a low coefficient of friction molecular film with a “glide” surface for glass, vitreous and metal substrates.

Applications:

display glass - provides a smooth tactile surface, low surface conductivity and improved scratch resistance

ceramic parts - reduces contact binding and adhesion, reduces scratching

nonferrous - provides a clear high water contact angle with excellent release properties

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 high	Type	 solvent-borne 1-part
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Siliglide™ 10

Description

Siliglide™ 10 is a siloxane modified polysilazane that reacts with glass, siliceous surfaces and other metal oxide surfaces to form a chemically bound polymethylsiloxane resin “siliconized” surface. The cure is activated by small quantities of water normally found on the surfaces of substrates.

Properties of Treated Surfaces

(Values reported are for glass slides dipped in 5% solutions of Siliglide™ 10 and cured at room temperature for 30 minutes)

critical surface tension

untreated	$\gamma_c = 78$ dynes/cm
treated (hydrophobic)	$\gamma_c = 25$ dynes/cm

Typical Properties of Siliglide™ 10

% active	5%
flashpoint	26°C
specific gravity	0.89-0.90
viscosity	1-2 cSt.

PP1-SG10 Siliglide™ 10

100g/\$26.00
750g/\$196.00

Cautions

Siliglide™ 10 is a dispersion in flammable solvents. Avoid skin and eye contact. Use in a well ventilated area wearing gloves and safety glasses.

Application Methods

1. Siliglide™ 10 coatings are most frequently applied as supplied or diluted to a 1-2% solution in dry solvents such as mineral spirits or esters such as isobutyl acetate. Articles are dipped or wiped. Articles can be cured by air drying for 25 minutes at conditions of <75% relative humidity. Buffing or wiping the surface with a soft rag during cure optimizes release by insuring a thin film covers surface imperfections. Over treatment results in a cloudy surface. The concentration should be reduced to eliminate this effect.



Gelest Aquaphile™ AQ

Hydrophilic Treatment For Glass and Ceramics





Features: Provide water-wettable silicone molecular films with high durability for glass and vitreous surfaces.

Applications:

optical lenses provides an anti-fog coating

clinical analysis - provides non-specific (albumin-like) binding of proteins and DNA.

(Not for food or drug use.)

Capsular Description:	Thickness	 molecular	Cure	 air/moisture	Hardness	 low	Type	 solvent-borne 1-part
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Gelest Aquaphile™ AQ

Polyamine functional silane that provides low-contact angle surfaces

Description

Aquaphile™ AQ is a partially quaternized polyamine functional silane in isopropanol. Air-dried films bond tenaciously to glass and ceramic substrates by reacting with hydroxy and silanol groups.

Properties of Treated Surfaces

(Values reported are for glass slides dipped in solutions of Aquaphile™ AQ and cured at room temperature for 4 hours.)

Typical Properties of Aquaphile™ AQ

% active	25%
flashpoint	12°C
specific gravity	0.84-0.86
viscosity	

PP1-AQAQ Aquaphile™ AQ

100g/\$24.00

1kg/\$168.00

Cautions

Aquaphile™ AQ is dispersed in isopropanol, a flammable solvent. Avoid skin and eye contact. Use in a well ventilated area wearing gloves and safety glasses.

Application Methods

Aquaphile™ coatings are most frequently applied directly or as a 10-20% mixture with dry alcohol. Articles are dipped or wiped. Articles can be cured by air drying for 4 hours at conditions of <75% relative humidity. Heat curing at 90-100°C for 10-15 minutes in an exhausted oven provides the most effective surface treatment.

Over treatment results in a cloudy surface. The concentration should be reduced to eliminate this effect



Gelest Ceramic™ SI

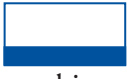



High Density Silicon Dioxide Films

Features: Provides thermally resistant dielectric coatings by dip or spin-on application.

Applications:

Electronics - provides dielectric layers for capacitors and other critical insulation applications.

Optics - provides overcoats for glass and quartz for index matching applications and as diffusion barriers.

Capsular Description:	Thickness	 thin	Cure	 thermal or UV	Hardness	 high	Type	 solvent-borne 1-part
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Seramic™ SI Silicon Dioxide Precursor

Description

Seramic™ SI is a β -chloroethylsilsesquioxane solution in methoxypropanol.

Film Properties

color	clear
dielectric constant	3.2-3.6
refractive index	
uncured films:	1.51
cured films:	2.1-2.2

Solution Properties

form	solution
solids	14-16%
density	0.96 g/cc
viscosity	3-5 cSt.
flashpoint	35°C

Shelf life: 6 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-SESI Ceramic™ SI	
100g/	\$78.00
750g/	\$368.00

Cautions

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

Application Methods

Thermal- Gelest Ceramic™ SI is applied as a coating by dipping or spin-on. After solvent evaporation, the system cures in 30-60 minutes at 300°C. As supplied, typical film deposition is 1500-2000 Å by spin-on application. Thinner films may be prepared by diluting with methoxypropanol or diglyme. The cure process liberates small amounts of ethylene and hydrogen chloride.

UV- Gelest Ceramic™ SI is converted to silicon dioxide on exposure to deep UV (<210nm). Exposed areas are insoluble, while unexposed areas may be removed by a solvent wash.



Gelest Ceramic™ SI-A





High Density Silicon Dioxide Films

Features: Provides thermally resistant dielectric coatings by dip or spin-on application.

Applications:

Electronics - provides dielectric layers for capacitors and other critical insulation applications.

Optics - provides overcoats for glass and quartz for index matching applications and as diffusion barriers.

Capsular Description:	Thickness	 thin	Cure	 thermal	Hardness	 high	Type	 solvent-borne 1-part
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Seramic™ SI-A Silicon Dioxide Precursor

Description

Seramic™ SI-A is a β-acetoxyethylsilsesquioxane solution in methoxypropanol.

Film Properties

color	clear
dielectric constant	3.2-3.6
refractive index	
uncured films:	1.40-1.45
cured films:	2.1-2.2

Solution Properties

form	solution
solids	18-20%
density:	0.97g/cc
viscosity:	3-5 cSt.
flashpoint	35°C

Reference

K. Ezbiansky et al, MRS. Symposium Proc., 606, 251, 2000

Shelf life: 6 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-SESIA Ceramic™ SI-A	
	100g/ \$84.00
	750g/\$480.00

Cautions

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

Application Methods

Thermal- Gelest Ceramic™ SI-A is applied as a coating by dipping or spin-on. After solvent evaporation, the system cures in 30-60 minutes at 350°C. The conversion temperature can be reduced to below <250°C by incorporation of 2% tetrabutylammonium fluoride. Films cured by catalysis have no absorption >190nm. As supplied typical film deposition is 1500-2000 Å by spin-on application. Thinner films may be prepared by diluting with methoxypropanol or diglyme. The cure process liberates small amounts of ethylene and acetic acid.





UV- Gelest Ceramic™ SI-A is converted to silicon dioxide on exposure to deep UV (<240nm). Exposed areas are insoluble, while unexposed areas may be removed by a solvent wash.

High Dielectric Constant Barium Strontium Titanate Films

Features: Provide thermally resistant dielectric coatings by dip or spin-on application.

Applications:

- Electronics** - provides high dielectric constant layers for capacitors and electroluminescent applications.
- Optics** - provide overcoats for glass and quartz for index matching applications and as diffusion barriers.

Capsular Description:	Thickness	 thin	Cure	 thermal	Hardness	 high	Type	 solvent-borne 1-part
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Seramic™ BST Barium Strontium Titanate Precursor

Description

Seramic™ BST is mixed barium strontium and titanium double metal alkoxides in a solution of higher alcohols. Cure is two-stage, moisture followed by thermal.

Film Properties

color	clear
Metal Atom Ratio	0.5:0.5:1.0 Ba:Sr:Ti
refractive Index:	1.8-1.9

Solution Properties

form	amber solution
solids	36-40%
flashpoint:	39°C
density:	1.00g/cc
grams of BaSr _{0.5} Ti _{0.5} O ₃ per 100 grams sol'n	11.0-12.0

Shelf life: 6 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-SEBS Ceramic™ BST
100g/ \$110.00
1kg/ \$660.00

Cautions

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

Application Methods

Gelest Ceramic™ BST is applied as a coating by dipping or spin-on. After solvent evaporation at 40-60% RH, the system cures in 15 minutes at 650°C. As supplied, typical film deposition is 1200-1500 Å by spin-on application at 3000rpm. Thinner films may be prepared by diluting with methoxypropanol or diglyme.





Silicone Resin Hard Coatings

Features: Provides clear silicone hard coat with excellent optical properties. HardSil™ A series are curable polysilsesquioxane 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.

Capsular Description:	Thickness	 thin-thick	Cure	 thermal	Hardness	 high	Type	 solvent-borne 1-part
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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.





Silicone Resin Hard Coatings

Features: Provides clear silicone hard coat with excellent optical properties. HardSil™ AP series are curable polysilsesquioxane 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.

Capsular Description:	Thickness		Cure		Hardness		Type	
		thin-thick		thermal		high		solvent-borne 1-part

HardSil™ AP Abrasion Resistant Coating - Thermal Cure

Description

HardSil™ AP is a primerless phenyl modified silicone dispersed in methoxypropanol for continuous use at temperatures up to 360°C.

Film Properties

Color	clear
Hardness, Rockwell R	120R
Tensile Strength	3500psi
Refractive Index	1.54-1.56

Solution Properties

Form	liquid
Solids	20%
Flashpoint	35°C
Specific Gravity	0.95
Viscosity	3-5 cSt.

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

Standard Packaging

PP1-HSAP HardSil™ AP	
	100g/\$29.00
	750g/\$150.00
	10kg/commercial package

Cautions

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

Application Methods

Gelest HardSil™ AP is applied as a coating by spraying, dipping or brushing. Material is allowed to dry for 1 hour and then cured at 240°C for 20-30 minutes. Thinner films may be prepared by diluting with methoxypropanol. Cure can be accelerated by adding 0.5% zinc 2-ethylhexanoate.





Electrical and Optical Barrier Silicone Resin Coating

Features: A clear silicone hard coat with excellent thermal and optical properties that provides a mechanical and oxidation barrier. HardSil™ AR is a curable polysilsesquioxane T-resin modified to provide sufficient flexibility to withstand thermal cycling associated with power-up of electrical and optical circuit components.

Applications:

Optical Components- provides effective scratch-resistant coatings with good adhesion to glass. High refractive index provides a step-index cladding.

Electrical components- hard, heat resistant coating for thermal cycling from room temperature to 290°C. Examples include resistor and capacitor coatings.

Capsular Description:	Thickness  thin-thick	Cure  thermal	Hardness  high	Type  solvent-borne 1-part
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HardSil™ AR High Temperature Electrical Coating - Thermal Cure

Description

HardSil™ AR is a primerless modified phenyl silicone resin for continuous use at temperatures up to 325°C, dispersed in methoxypropanol.

Film Properties

Color	clear
Hardness, Rockwell R	110
Refractive Index	1.56-1.58
Volume Resistivity	1x10 ¹³ ohm-cm

Solution Properties

Form	liquid
Solids	20%
Flashpoint	35°C
Specific Gravity	0.92
Viscosity	3-5 cSt.

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

Standard Packaging

PP1-HSAR HardSil™ AR	
	100g/ \$29.00
	1kg/\$196.00
	10kg/commercial package

Cautions

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

Application Methods


Gelest HardSil™ AR is applied as a coating by spraying, dipping or brushing. Material is allowed to dry for 1 hour and then cured at 220°C for 20-25 minutes. Thinner films may be prepared by diluting with methoxypropanol. Cure can be accelerated by adding 0.5% zinc 2-ethylhexanoate, although this will reduce volume resistivity.

Thermoplastic Silicone-Block Polymers

Features: Provides thin film high strength coatings and films. Sibrid® T series are fully cured thermoplastic silicone block polymers with the ability to form thin film sections combined with high permeability allowing maximum transport of water and oxygen.

Applications:

- electronic devices** - strippable low dielectric constant coatings.
- microelectrodes** - electrolyte confinement with high gas transport.
- membranes** - form high strength, high O₂ and H₂O transport rate films.

Capsular Description:	Thickness	 thin	Cure	 air/moisture	Hardness	 medium	Type	 solvent-borne 1-part
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Sibrid®TI Thermoplastic Silicone-Polyimide

Description

Sibrid® TI is a fully cured thermoplastic silicone-polyimide block copolymer dissolved in N-methylpyrrolidone solvent. It is suitable for casting or coating.

Film Properties

Color	light gold-amber
Tensile Strength	>3500 psi
Dielectric Constant	2.56
Specific Gravity	1.18
Glass Transition	168°C
Permeability, O ₂	35 $\frac{(10^{-9} \text{ cc O}_2(\text{RTP}) \text{ cm}}{\text{s., cm}^2, \text{ cmHg } \Delta P}$

Solution Properties

Form	solution
Solids	14-16%
Flashpoint	86°C
Specific Gravity	1.1
Refractive Index	1.49

Standard Packaging

PP1-SBTI Sibrid® TI	
	100g/ \$19.00
	1kg/ \$134.00
	10kg/commercial package

Caution

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

Application Methods

Gelest Sibrid® TI is applied as a coating by spraying, dipping or brushing. The solvent is removed by evaporation at 75°C-125°C in an exhausted oven. As supplied, typical film deposition is 25-50 microns. Thinner films (<10 micron) may be prepared by diluting with THF, NMP or dioxane.



Gelest Zipcone™ CE





Conformal Coating Pure Silicone Elastomer

Features: Provides conformal silicone elastomer films with excellent electrical properties that may be removed mechanically or by solvent systems. Systems are high-speed moisture cure.

Applications:

electronic devices- forms a soft conformal coating.

temporary conformable gaskets and seals- may be applied by dipping or brushing.

Capsular Description:	Thickness	 thin-thick	Cure	 air/moisture	Hardness	 low	Type	 100% active 1-part
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Gelest Zipcone™ CE low viscosity, solvent-free polydimethylsiloxane RTV

Description

Zipcone™ CE is a moisture activated silicone RTV containing no fillers. In the presence of atmospheric moisture, a condensation of silicone prepolymers occurs. The byproduct of the cure reaction is acetone. The system is designed as a physical and moisture barrier for electrical and optical assemblies which can be debonded for maintenance. A UV tracer dye has been incorporated to enable inspection of coating integrity.

Cured Properties

Tensile Strength	50psi
Elongation	40%
Durometer, Shore A	30
Volume Resistivity, ohm-cm	1x10 ¹⁴

Uncured Properties of Zipcone™ CE

Solids	97%
Viscosity	60-70 cSt.
Skin-over time	4-6 minutes
Cure time (0.25mm)	6-9 hours
Specific gravity	0.97

Standard Packaging

PP1-ZPCE Zipcone™ CE
100g/\$38.00
750g/\$180.00
17kg/commercial package

Application Methods

Zipcone™ C series is applied by dipping, brushing, flow-coat or spin-on. Cure is at room temperature. After opening, containers should be inerted with dry air or nitrogen before sealing, to avoid cure in the container.



Gelest Zipcone™ CG





Conformal Coating Pure Silicone Elastomers

Features: Provides conformal silicone elastomer films with excellent electrical properties that may be removed mechanically or by solvent systems. Systems are high-speed moisture cure.

Applications:

electronic devices- forms a soft conformal coating.

temporary conformable gaskets and seals- may be applied by dipping or brushing.

Capsular Description:	Thickness	 thin-thick	Cure	 air/moisture	Hardness	 low	Type	 100% active 1-part
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Gelest Zipcone™ CG medium viscosity, solvent-free polydimethylsiloxane RTV

Description

Zipcone™ CG is a moisture activated 100% solids silicone RTV. In the presence of atmospheric moisture, a condensation of silicone prepolymers occurs. The byproduct of the cure reaction is acetone. The system is designed as a physical and moisture barrier for electrical and optical assemblies which can be debonded for maintenance. A UV tracer dye has been incorporated to enable inspection of coating integrity.

Cured Properties

Tensile Strength	>110psi
Elongation	>100%
Durometer, Shore A	25
Volume Resistivity, ohm-cm	3x10 ¹⁴

Uncured Properties of Zipcone™ CG

Solids	100%
Viscosity	2500 cSt.
Skin-over time	5-6 minutes
Cure time (0.25mm)	6-9 hours
Specific gravity	1.03

Standard Packaging

PP1-ZPCG Zipcone™ CG	
	100g/\$45.00
	1kg/\$270.00
	17kg/commercial package

Application Methods

Zipcone™ C series is applied by dipping, brushing, flow-coat or spin-on. Cure is at room temperature. After opening, containers should be inerted with dry air or nitrogen before sealing, to avoid cure in the container.

Filler-Free Fast-Cure Pure Silicone Elastomers

Features: Provides thick film rapid-cure pure silicone elastomers with good adhesion to metals, glass and solvent compatible plastics and fibers. Products are free of abrasive-silica. Systems are high-speed moisture cure.





Applications:

electronic devices - forms a soft conformal coating, free of abrasive silica.

rubber and plastic overcoat - provides a uniform low-roughness coating suitable for release and with an exceptionally smooth touch.

supported membranes - filler-free silicone allows maximum transport of gases.

thin film seals and conformable gaskets - may be applied by dipping or brushing.

Capsular Description:	Thickness	 thin-thick	Cure	 air/moisture	Hardness	 low	Type	 solvent-borne 1-part
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Gelest Zipcone™ FA polydimethylsiloxane RTV for maximum adhesion to polar substrates

Description

Zipcone™ FA is a moisture activated filler-free silicone RTV dispersed in a solution of methyltetrahydrofuran. In the presence of atmospheric moisture, a condensation of silicone prepolymers occurs. The byproduct of the cure reaction is acetic acid which imparts a vinegar-like odor. The system is designed for wet out and adhesion to polar substrates.

Cured Properties

Tensile Strength	>100psi
Elongation	>150%
Durometer, Shore A	>8
Tear Strength	>5pli

Uncured Properties of Zipcone™ FA

Solids	48-52%
Viscosity	200-400 cSt.
Skin-over time	30-45 minutes
Cure time (0.25mm)	6-9 hours
Specific gravity	1.05
Flashpoint	-11°C

Standard Packaging

PP1-ZPFA Zipcone™ FA	
100g	\$22.00
750g	\$132.00
10kg	commercial package

Cautions

Zipcone™ F series contain flammable solvents and cure released byproducts which are eye irritants. Avoid skin and eye contact. Use in a well ventilated area wearing gloves and safety glasses. Consult MSDS of the specific product used for additional safety information.

Application Methods





Zipcone™ F series is applied by dipping, brushing or spin-on. Solvent is allowed to evaporate in an exhausted area. Cure is at room temperature. After opening, containers should be inerted with dry air or nitrogen before sealing to avoid cure in the container.

Filler-Free Fast-Cure Pure Silicone Elastomer for Maximum Release

Features: Provides thick film rapid-cure pure silicone elastomers with good adhesion to metals, glass and solvent compatible plastics and fibers. Products are free of abrasive-silica. Systems are high-speed moisture cure.

Applications:

- electronic devices** - forms a soft conformal coating, free of abrasive silica.
- rubber and plastic overcoat** - provides a uniform low-roughness coating suitable for release and with an exceptionally smooth touch.
- supported membranes** - filler-free silicone allows maximum transport of gases.
- thin film seals and conformable gaskets** - may be applied by dipping or brushing.

Capsular Description:	Thickness		Cure		Hardness		Type	
		thin-thick		air/moisture		low	solvent-borne 1-part	

Gelest Zipcone™ FN polydimethylsiloxane RTV for rapid, neutral cure, maximum release

Description

Zipcone™ FN is a moisture activated filler-free silicone RTV dispersed in odorless hydrocarbon. In the presence of atmospheric moisture, a condensation of silicone prepolymers occurs. The byproduct of the cure reaction is an amine. Amine byproducts have little or no corrosive effects on most metals, but copper is affected.

Cured Properties

Tensile Strength	>50psi
Elongation	>150%
Durometer, Shore A	>5
Tear Strength	>5pli
Refractive Index	1.403

Uncured Properties of Zipcone™ FN

Solids	32-35%
Viscosity	100-150 cSt.
Skin-over time	15 minutes
Cure time (0.25mm)	2 hours
Specific gravity	0.81
Flashpoint	0°C

Standard Packaging

PP1-ZPFN Zipcone™ FN
100g/\$28.00
650g/\$140.00
10kg/commercial package

Cautions

Zipcone™ F series contain flammable solvents and cure released byproducts which are eye irritants. Avoid skin and eye contact. Use in a well ventilated area wearing gloves and safety glasses. Consult MSDS of the specific product used for additional safety information.

Application Methods

Zipcone™ F series is applied by dipping, brushing or spin-on. Solvent is allowed to evaporate in an exhausted area. Cure is at room temperature. After opening, containers should be inerted with dry air or nitrogen before sealing to avoid cure in the container.



Gelest Zipcone™ TC

Fast-Cure Thermal Control White Silicone Elastomer

Features: Provides highly thermal conductivity silicone elastomeric coatings with excellent heat resistance, electrical insulation and good adhesion to a variety of substrates.

Applications:

appliances - soft white insulating coatings with a comfortable touch.

electrical devices and connectors - insulating coatings with heat dissipation properties

Capsular Description:	Thickness  thick	Cure  air/moisture	Hardness  medium	Type  solvent-borne 1-part
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Zipcone™ TC Thermally Conductive Coating

Description

Zipcone™ TC is a high magnesium oxide load, oxime cure RTV dispersed in odorless mineral spirits.

Film Properties

Color	white
Durometer, Shore A	20-25
Specific Gravity	1.2
Tensile strength	>250psi
Elongation	>250%

Solution Properties

Form	Liquid Dispersion
Solids	65%
Viscosity	400-600 cSt.
Flashpoint	57°C

Standard Packaging

PP1-ZPTC Zipcone™ TC
100g/ \$42.00
1kg/ \$194.00

Cautions

Use in a well ventilated area.
Combustible -Avoid flame and ignition sources.

Application Methods

Zipcone™ TC is applied by brushing or dipping. Recommended coating thickness is 100 microns (4-5mils). Room temperature cure profile at 50% R.H. is skin over: 20 min; tack free: 90 min; full cure 5 days. Thinner coatings may be applied by diluting with dry solvents such as toluene, naptha, or hexane.



Gelest Zipcone™ TR

Fast-Cure Highlight Reflectivity White Silicone Elastomers

Features: Provides high light reflectivity silicone elastomeric coatings with excellent heat resistance, electrical insulation and good adhesion to a variety of substrates.

Applications:

aerospace - reflective/conductive coatings withstand weather and thermal extremes.

electrical devices and connectors - insulating silicones with heat dissipation properties

silicone rubber fabrication - marking inks and seals.

Capsular Description:	Thickness		Cure		Hardness		Type	
		thick		air/moisture		medium		solvent-borne 1-part

Zipcone™ TR Reflective Thermal Control Coating

Description

Zipcone™ TR is a high titanium dioxide load, oxime cure RTV dispersed in odorless mineral spirits.

Film Properties

Color	white
Durometer, Shore A	25-30
Specific Gravity	1.54
Tensile strength	>250psi
Elongation	>250%

Solution Properties

Form	Liquid Dispersion
Solids	70%
Viscosity	500-700 cSt.
Flashpoint	57°C

Standard Packaging

PP1-ZPTR	Zipcone™ TR
	100g/ \$42.00
	1kg/ \$252.00

Caution

Use in a well ventilated area.
Combustible -Avoid flame and ignition sources.

Application Methods

Zipcone™ TR is applied by brushing or dipping. Recommended coating thickness is 100 microns (4-5mils). Room temperature cure profile at 50% R.H. is skin over: 20 min; tack free: 90 min; full cure 5 days. Thinner coatings may be applied by diluting with dry solvents such as toluene, naptha, or hexane.



Gelest Zipcone™ UA

Ultraviolet Cure Clear Silicone Elastomer for Polymethacrylates

Features: Provide UV cure silicone elastomer coatings with high transparency and refractive index control.

Applications:

optical component coating - effective cladding and elastomeric seals.

optical thermoplastics - provides index matching (UA) for polymethacrylates. Applications include glazing, windscreens and computer screens.

Capsular Description:	Thickness  thin to thick	Cure  UV	Hardness  medium	Type  1-part
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Zipcone™ UA Index matching - UV Cure

Description

Zipcone™ UA is a clear acrylate modified silicone designed for UV cure.

Film Properties

Color	clear
Refractive Index	1.464
Hardness, Shore A	>60
Tensile Strength	80-120psi
Elongation	1%

Uncured Properties

Form	liquid
Solids	100%
Viscosity	40-180 cSt.
Specific Gravity	1.10
Flashpoint	>65°C

Shelf life: 3 months when stored below 15°C in sealed, light-protected containers.

Standard Packaging

PP1-ZPUA Zipcone™ UA
100g/\$110.00
1kg/\$660.00

Caution

Use in a well-ventilated area.
Avoid contact with skin and eyes.

Application Methods

Zipcone™ UA is applied as a coating by dipping, brushing or syringing. Exposure to UV irradiation at 250-364 nm (mercury lamp) cures the coating in <1 minute. Oxygen inhibits film formation. Nitrogen blanket or other methods of air exclusion are recommended.

Ultraviolet Cure Clear Silicone Elastomers

Features: Provides an abrasion resistant UV cure silicone elastomer coatings with high transparency and refractive index control.

Applications:

optical component coating - effective cladding and elastomeric seals.

optical thermoplastics - provides scratch resistance for polycarbonates and polymethacrylates.

Applications include glazing, windscreens and computer screens.

Capsular Description:	Thickness  thin to thick	Cure  UV	Hardness  medium	Type  1-part
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Zipcone™ UE Abrasion Resistant - UV Cure

Description

Zipcone™ UE is a primerless epoxycyclohexyl modified silicone designed for UV cure.

Film Properties

Color	clear
Abrasion Resistance, Taber 500 cycles 500g CS10F	4-9
Refractive Index	1.470

Uncured Properties

Form	liquid
Solids	100%
Viscosity	25-75 cSt.
Specific Gravity	0.99
Flashpoint	57°C

Shelf life: 3 months when stored below 25°C in sealed, light-protected containers.

Standard Packaging

PP1-ZPUE Zipcone™ UE
100g/\$51.00
1kg/\$360.00

Caution

Use in a well-ventilated area.
Combustible.
Avoid contact with skin and eyes.

Application Methods

Zipcone™ UE is applied as a coating by spraying, dipping or brushing. Exposure to UV irradiation at 250-300 nm (type H lamp preferred with a minimum energy density of 150mj/cm² cures the coating in <1 minute. Thinner coatings may be applied by diluting with dry methoxypropanol or isopropanol.

Clear Dimethylsilicone Gel Elastomers

Features: Gels are solids with fluid characteristics. They provide mechanical protection and dampening with good cohesion, high instantaneous deformation.

Applications:

shock absorption- provide a property range extending from vibration dampening to sound absorption

electrical devices- provide low stress protection to delicate components.

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

Gelest Gel D200 2-Part Silicone Gel

Description

Gel D200 is a temporarily deformable medium penetration gel with typical dimethylsilicone properties and a refractive index of 1.41.

Gel Properties

Color	clear
Refractive Index	1.407
Penetration	150-250mm
Specific Gravity	0.97

Uncured Properties

Form	liquid
Viscosity	1000 cSt

Processing

Gel D200 is a 2-part addition cure system. Each system comprises an "A" part and a "B" part which are mixed in a 10:1 ratio. After thoroughly mixing 10 parts "A" to 1 part "B", allow mix to de-air. Pot life is 3-4 hours. Pour or syringe around part or into cavity. Cure at 115-120°C for 30-60 minutes or at room temperature for 48 hours. If the gel is too firm (low penetration), increase the ratio of A to B to 11:1, 12:1 etc.

Caution: Avoid contact with skin and eyes

Shelf life: 12 months when stored below 25°C in sealed containers.

Standard Packaging

PP2-D200 Gelest Gel D200
1kg/\$60.00 (910g D200A, 90g D200B)

Gelest Gel D300 2-Part Silicone Gel

Description

Gel D300 is a temporarily deformable high penetration gel with typical dimethylsilicone properties and a refractive index of 1.41.

Gel Properties

Color	clear
Refractive Index	1.407
Penetration	200-400mm
Specific Gravity	0.97

Uncured Properties

Form	liquid
Viscosity	350 cSt

Processing

Gel D300 is a 2-part addition cure system. Each system comprises an "A" part and a "B" part which are mixed in a 10:1 ratio. After thoroughly mixing 10 parts "A" to 1 part "B", allow mix to de-air. Pot life is 3-4 hours. Pour or syringe around part or into cavity. Cure at 115-120°C for 30-60 minutes or at room temperature for 48 hours. If the gel is too firm (low penetration), increase the ratio of A to B to 11:1, 12:1 etc.

Caution: Avoid contact with skin and eyes

Shelf life: 12 months when stored below 25°C in sealed containers.

Standard Packaging

PP2-D300 Gelest Gel D300
1kg/\$65.00 (910g D300A, 90g D300B)



Gelest GEL Series

Clear Specialty Silicone Gel Elastomers

Features: Gels are solids with fluid characteristics. They provide mechanical protection and dampening with good cohesion, high instantaneous deformation and good resilience with a wide range of chemical resistance and refractive index control.

Applications:

optical component coating- coupling media and elastomeric seals.

shock absorption- provide a property range extending from vibration dampening to sound absorption

electrical devices- provide low stress protection to delicate components.

Capsular Description:	Thickness  thick	Cure Pt catalyst	Hardness  low	Type  100% active 2-part
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Gelest Gel P065 2-Part Silicone Gel

Description

Gel P065 is a temporarily deformable material with excellent low temperature properties and a refractive index of 1.43. It performs as a dielectric gel from 115° to 235°C.

Gel Properties

Color	clear
Refractive Index	1.430
Penetration	60-80mm
Specific Gravity	0.99
Dielectric Constant	2.8

Uncured Properties

Form	liquid
Viscosity (initial mix)	700-800 cSt

Processing

Gel P065 is a 2-part addition cure system. It is comprised of "A" and "B" parts which are mixed in a 1:1 ratio. After thoroughly mixing 1 part "A" to 1 part "B", allow mix to de-air. Pot life is 3-4 hours. Pour or syringe around part or into cavity. Cure at 115-120°C for 30-60 minutes or at room temperature for 48 hours. If the gel is too firm (low penetration) increase the ratio of A to B to 1.1:1, 1.2:1 etc.

Caution: Avoid contact with skin and eyes

Shelf life: 12 months when stored below 25°C in sealed containers.

Standard Packaging

PP2-P065 Gelest Gel P065
100g/\$65.00
1kg/\$390.00

Gelest Gel F065 1-Part Silicone Gel

Description

Gel F065 is a temporarily deformable material with fluorosilicone properties, providing fuel resistant properties and a low refractive index. The one part addition cure system is technically achieved by incorporating a fugitive inhibitor to the catalyzed mix.

Gel Properties

Color	clear
Refractive Index	1.384
Penetration	60-80mm
Specific Gravity	1.27

Uncured Properties

Form	liquid
Viscosity	1200-1500 cSt

Processing

Gel F065 is a 1-part addition cure system. Pour or syringe around part or into cavity. Cure at 100-150°C for 20-30 minutes. If the gel is too firm (low penetration), FMV-4031 fluorosilicone polymer can be added at 5-20% levels prior to cure.

Caution: Avoid contact with skin and eyes

Shelf life: 6 months when stored below <0°C in sealed containers.

Standard Packaging

PP1-F065 Gelest Gel F065
100g/\$160.00

High Modulus Clear Casting and Impregnation Resin




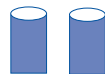
Features: Provides rigid silicone resins with excellent optical properties. HardSil™ C is a curable phenyl silicone resin with excellent thermal stability and good electrical properties.

Applications:

Electrical Components - high temperature, high power encapsulating and mounting resin.

Laminated Structures - hard, heat resistant impregnants for continuous exposures up to 300°C.

X-ray equipment- radiation resistant encapsulating resin.

Capsular Description:	Thickness  thick	Cure  thermal	Hardness  high	Type  2-part
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HardSil™ CC Clear Casting and Impregnation Resin

Description

HardSil™ CC is a peroxide curable solventless silicone resin supplied with catalyst.

Bulk Properties

Color	clear-straw transparent
Dielectric Strength (1/8")	350 volts/mil
Volume Resistivity	5 x 10 ¹⁵ ohm-cm
Refractive Index	1.530

Resin Properties

Form	liquid
Flashpoint	>180°C
Specific Gravity	1.10
Viscosity	80-150 cSt.

Application Methods

Gelest HardSil™ CC Part A (resin) and 1 wgt % Part B (peroxide) are combined and mixed thoroughly. The mix is poured or applied as an encapsulant or impregnant. Cure is for 6 hours at 150°C followed by two hours at 200°C. If the component is operating above 200°C, it should be cured for three hours at the maximum operating temperature before entering service.

Cautions

Use in a well ventilated area.
 Avoid contact with skin and eyes.
 Part B catalyst is an oxidizer and should be stored away from flammables.

Shelf life: 12 months when stored below 25°C in sealed containers.

Standard Packaging

PP2-HSCC HardSil™ CC 99:1 kit
100g/\$140.00
1kg/\$925.00



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.

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

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

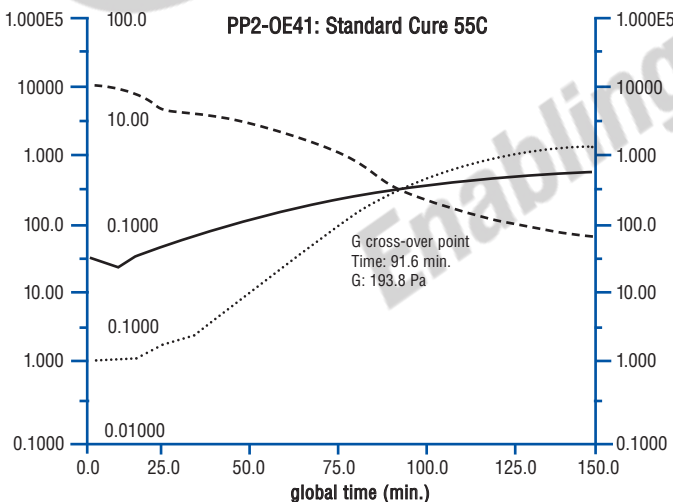
Refractive Index	1.407
Tensile Strength	>300psi
Elongation	140-200%
Durometer, Shore A	15-30
Tear Strength	5-15pli

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 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™ OE41.4B**

1 kg kit (500g OE41.4A, 500g OE41B):	\$96.00
6 kg kit (3kg OE41.4A, 3kg OE41.4B):	\$384.00

Gelest OE™ 41.6 Low Volatility

Low volatility content of **Gelest OE™ 41.6** offers advantages in electrical and high vacuum where bleed or migration of low molecular weight species can have deleterious effects.

PP2-OE41.6 **Gelest OE™ 41.6**

1 kg kit (500g OE41.6A, 500g OE41.6B):	\$160.00
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Gelest OE™ 41.7 Low Volatility in solution

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

PP1-OE41.7 **Gelest OE™ 41.7**

100g/\$85.00



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.

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

<p>Gelest OE™ 42 1.42 refractive index 2-part silicone RTV encapsulant, supplied as 1:1 kit</p> <p>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.</p> <p>Cured Properties</p> <table border="0"> <tr><td>Refractive Index</td><td>1.420</td></tr> <tr><td>Tensile Strength</td><td>>200psi</td></tr> <tr><td>Elongation</td><td>90-150%</td></tr> <tr><td>Durometer, Shore A</td><td>10-25</td></tr> <tr><td>Tear Strength</td><td>5-10pli</td></tr> </table> <p>Uncured Properties of Gelest OE™ 42 Viscosity (1:1) catalyzed: 1500-2000 cSt.</p> <p>Standard Packaging PP2-OE42 Gelest OE™ 42</p> <table border="0"> <tr><td>1 kg kit (500g OE42-A, 500g OE42B):</td><td>\$180.00</td></tr> <tr><td>6 kg kit (3kg OE42-A, 3kg OE42B):</td><td>\$748.00</td></tr> </table>	Refractive Index	1.420	Tensile Strength	>200psi	Elongation	90-150%	Durometer, Shore A	10-25	Tear Strength	5-10pli	1 kg kit (500g OE42-A, 500g OE42B):	\$180.00	6 kg kit (3kg OE42-A, 3kg OE42B):	\$748.00	<p>Gelest OE™ 43 1.43 refractive index 2-part silicone RTV encapsulant, supplied as 1:1 kit</p> <p>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.</p> <p>Cured Properties</p> <table border="0"> <tr><td>Refractive Index</td><td>1.430</td></tr> <tr><td>Tensile Strength</td><td>>200psi</td></tr> <tr><td>Elongation</td><td>75-100%</td></tr> <tr><td>Durometer, Shore A</td><td>5-15</td></tr> <tr><td>Tear Strength</td><td>5-10pli</td></tr> </table> <p>Uncured Properties of Gelest OE™ 43 Viscosity (1:1) catalyzed: 800-1500 cSt.</p> <p>Standard Packaging PP2-OE43 Gelest OE™ 43</p> <table border="0"> <tr><td>1 kg kit (500g OE43-A, 500g OE43B):</td><td>\$180.00</td></tr> <tr><td>6 kg kit (3kg OE43-A, 3kg OE43B):</td><td>\$748.00</td></tr> </table>	Refractive Index	1.430	Tensile Strength	>200psi	Elongation	75-100%	Durometer, Shore A	5-15	Tear Strength	5-10pli	1 kg kit (500g OE43-A, 500g OE43B):	\$180.00	6 kg kit (3kg OE43-A, 3kg OE43B):	\$748.00
Refractive Index	1.420																												
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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 over 72 hours.



Gelest Reprographic and Moldmaking Series

Filler-Free 2-part Silicone Elastomers

Features: Provide low surface roughness silicone elastomers with high definition in thin sections with moderate viscosity and extended pot-life for accurate reprographic and prototype transfer technologies. Systems are vinyl-addition (platinum) cure.

Applications:

micro-contact printing- provides stamp and transfer detail to dimensions of 1 micron.

design transfer- high definition allows accurate image transfer from prototypes.

Capsular Description:	Thickness  thick	Cure Pt catalyst	Hardness  medium	Type  100% active 2-part
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Gelest RG™ 01 2-part reprographic silicone elastomer, supplied as 10:1 kit

Description

Gelest RG™ 01 is a flexible, clear molding and encapsulation compound. The moderate viscosity of the catalyzed mix and long pot-life at room temperature make this extremely useful in micro-contact printing, prototype and small production run applications.

Cured Properties

Refractive Index	1.43
Dielectric Constant	2.7
Critical Surface Tension	23-24 dynes/cm
Tensile Strength	800-1000psi
Elongation	80-100%
Durometer, Shore A	30-40
Tear Strength	10-15pli
Specific Gravity	1.04

Uncured Properties of Gelest RG

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

Application Methods

Thoroughly mix Part A with 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. Cure at 55°C for 4 hours or at room temperature over 36 hours.

Standard Packaging

PP2-RG01 Gelest RG™ 01
1.1 kg kit (1000g RG01-A, 100g RG01B): \$180.00

Gelest RG™ 02 2-part oleophilic reprographic silicone elastomer, supplied as 10:1 kit

Description

Gelest RG™ 02 is a clear to translucent 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.

Cured Properties

Refractive Index	1.43
Dielectric Constant	2.6
Critical Surface Tension	27-29 dynes/cm
Tensile Strength	600-800psi
Elongation	80-100%
Durometer, Shore A	25-35
Tear Strength	10-12pli
Specific Gravity	1.04

Uncured Properties of Gelest RG

Viscosity (10:1) catalyzed:	3000-4000 cSt
Viscosity- Part A: (base)	5000-5500 cSt
Part B (crosslinker):	75-125 cSt

Application Methods

Thoroughly mix Part A with 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. Cure at 55°C for 4 hours or at room temperature over 36 hours.

Standard Packaging

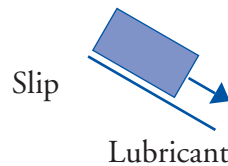
PP2-RG02 Gelest RG™ 02
1.1 kg kit (1000g RG02-A, 100g RG02B): \$240.00

Gelest PP1-LUB01

Fluorocarbon-Fluorosilicone Light Grease

Features: Provides a clean nonstick/slip boundary lubricant for electrical contact and precision timing devices.

Capsular
Description:



Description

Gelest PP1-LUB01 is a highly lubricious gel consisting of submicron particles of fluoropolymer dispersed in a fluorinated silicone copolymer. The gel has the unusual property of exhibiting increased slip as higher shear force is applied

Lubrication Properties

4-ball wear, mm, 232°C: (1200 rpm, 40 kg, 2hrs, M-10 steel)	1.60-1.65
Dropping-point, °C:	200-210
Penetration, 60 stroke:	320-340
Coefficient of friction, static carbon steel after break-in	0.10-0.12

Bulk Properties

Viscosity, cSt:	8000-9000
Specific gravity:	1.41

Standard Packaging





PP1-LUB01
100g/\$140.00
1kg/\$980.00

Hybrid Silicone Primer for Low Polarity Surfaces

Features: Provide thin adhesive films that act as primers for organic resins on metal and glass substrates. Sibrid® Primer A1 is a silane modified organic polymer with the ability to form thin films on siliceous and metal substrates and then crosslink with subsequently applied organic resins at room or moderately elevated temperatures.

Applications:

- optical-electronic interface device assembly and packaging
- thin film adhesive protective coatings
- primer on metals, glass and concrete for organic coatings

Capsular Description:	Thickness	 thin-thick	Cure	 air/moisture	Hardness	 medium	Type	 solvent-borne 1-part
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Gelest® Primer A1 Adhesive/primer for low polarity resins

Description

Gelest® Primer A1 is a linear polymer containing reactive alkoxy silane, anhydride and unsaturation functionality dissolved in toluene. It is suitable for nonpolar resins including silicones and polyolefins. The primer is normally applied to the inorganic substrate and after drying the polymer is applied.

Solution Properties

Form	amber solution
Solids	12-14%
Flashpoint	5°C
Specific Gravity	0.85
Viscosity	2-5 cSt.

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

Standard Packaging

PP1-SBPA1 Gelest® Primer A1
100g/ \$29.00
1kg/ \$174.00

Caution

Use in a well ventilated area.
Flammable. Avoid contact with skin and eyes.
Product is moisture sensitive. Containers should be tightly sealed.

Application Methods

Gelest® Primer A1 is applied as a coating by spraying, dipping or brushing. The solvent is removed by evaporation in an exhausted area. Simultaneous with evaporation, moisture induced cross-linking is initiated. After drying, maximum bond strength with the substrate is achieved by heating to 80°C for 30 minutes, but normally this is not necessary.



Silicone Fluids for Optical Applications

Gelest offers pure silicone fluids (not blends) with a wide range of refractive indices. Listed below are fluids with refractive indices and viscosities. Detailed information including chemical structure, physical properties, electrical properties and chemical structure can be found in the Gelest product literature entitled Silicone Fluids: Stable, Inert Media. Fluids with the same product code prefix can be blended to exact refractive index requirements.

Product Code	Refractive Index 589.3nm	Viscosity (cSt)	Price/25g	Price/100g
SIB1816.0	1.336	6-7	\$98.00	\$320.00
FMS-121	1.382	80-120	\$38.00	\$124.00
FMS-221	1.387	80-120	\$13.00	\$41.00
DMS-T12	1.400	20		\$10.00
DMS-T21	1.402	100		\$10.00
DMS-T22	1.403	200		\$10.00
PDM-0421	1.422	100		\$14.00
PTT-1117	1.428	70-75		\$32.00
DBE-224	1.430	400		\$16.00
PDM-0821	1.436	100-125		\$12.00
DES-T12	1.439	15-20		\$80.00
ALT-143	1.445	600-1000		\$14.00
DBE-814	1.452	40-50		\$12.00
ALT-213	1.462	1200-1600		\$19.00
PMM-0011	1.470	10-20	\$28.00	\$90.00
PDM-1922	1.490	160-230		\$22.00
ALT-233	1.493	1500-2000		\$16.00
PMM-5021	1.500	125		\$21.00
PMM-6025	1.506	500-550		\$20.00
PMM-0021	1.520	100-200		\$78.00
PMM-0025	1.533	500		\$21.00
PMP-5025	1.543	400-500	\$35.00	\$112.00
PDM-7040	1.556	35-40		\$38.00
PDM-7050	1.588	170-175		\$52.00

Gelest Product Lines



Silicon Compounds: Silanes & Silicones

Detailed chemical properties and reference articles for over 2000 compounds. The 560 page Gelest catalog of silicon and metal-organic chemistry includes scholarly reviews as well as detailed application information. Physical properties, references, structures, CAS numbers as well as HMIS (Hazardous Material Rating Information) of metal-organic and silicon compounds enable chemists to select materials to meet process and performance criteria.



Reactive Silicones - Forging New Polymer Links

The 48 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. The detailed text provides starting-point formulations, references and application information. Vinyl, hydride, silanol and alkoxy functional silicones are provided for conventional silicone cure systems. Amine, epoxy, methacrylate, hydroxy and mercapto silicones are provided for hybrid organic-silicone cure systems.



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

A description of non-functional silanes that are used to prepare hydrophobic and water repellent surfaces, as well as polar and hydroxylic silanes used to prepare wettable surfaces.



Metal-Organics for Material & Polymer Technology

A reference manual for optical and electronic and nanotechnology applications. The literature provides information on metallization, electroceramic, and dielectric applications of silicon, germanium, aluminum, gallium, copper and other metal chemistries. Deposition techniques include ALD, CVD, spin coating and self-assembled monolayers (SAMs). Presents chemistry and physics in the context of device applications ranging from ULSI semiconductors to DNA array devices to flat-panel displays.



Gelest

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