



## 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	$1 \times 10^{12}$ ohms
treated	$1.2 \times 10^{13}$ 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 <sup>2</sup>
treated	0.01-0.02mg/mm <sup>2</sup>

#### 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 m<sup>2</sup> 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.