



# Silquest\* A-1100

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### Description

Silquest A-1100 silane, gamma-Aminopropyltriethoxysilane, a versatile amino-functional coupling agent may be an excellent candidate for use in a range of broad applications to provide superior bonds between inorganic substrates and organic polymers.

### Typical Physical Properties

Physical Form	Liquid
Color	Clear, colorless
Specific Gravity at 25/25°C	0.9500
Boiling Point at 760 mm Hg, °C (°F)	220 (428)
Refractive Index, $n_D$ 25°C	1.420
Flash Point, Pensky-Martens Closed Cup <sup>(1)</sup> , °C (°F)	96 (205)

(1) ASTM Method D 93

### Chemical Structure

The silicon-containing portion of the molecule can help provide strong bonding to substrates. The primary amine function reacts with a wide array of thermoset, thermoplastic and elastomeric materials. Silquest A-1100 silane has the following structural formula:



### Potential Applications

#### Coatings, Adhesives and Sealants

This aminosilane is an excellent adhesion promoter in acrylic coatings, adhesives and sealants. With polysulfide, urethane, RTV silicones, epoxy, nitrile, and phenolic adhesives and sealants, the product improves pigment dispersion and maximizes adhesion to glass, aluminum and steel.

#### Glass-Reinforced Resin Systems

In glass-reinforced thermosets, Silquest A-1100 silane enhances the flexural, compressive and interlaminar shear strengths before and after exposure to humidity. This product greatly improves wet electrical properties. Glass-reinforced thermoplastics, polyamides, polyesters and polycarbonates exhibit increased flexural and tensile strengths before and after wet exposure when this silane is used.

#### Glass Fiber and Mineral Wool Insulation

As a phenolic resin binder additive, Silquest A-1100 silane imparts moisture resistance and allows recovery after compression.

#### Mineral-Filled Resin Systems

Silquest A-1100 silane maximizes the physical and electrical properties of mineral-filled phenolics, epoxies, polyamides, polybutylene terephthalate and a host of other thermoset and thermoplastic composites. Filler wetting and dispersibility in the polymer matrix are also improved.

### Foundry Applications

In shell molding, this silane strengthens the bond between the phenolic binder and foundry sand.

### Grinding Wheels

The product promotes an improved, water-resistant bond between the abrasive grit and phenolic resin binder.

### Solubility

Many of the potential applications for Silquest A-1100 silane require complete solubilization without the formation of finely dispersed particles. These particles appear as a haze when dispersed in water. Our unique process and carefully controlled process conditions typically produce Silquest A-1100 silane that minimize the amount of haze that is often found in competitors' products.

Figure 1 illustrates the very low levels of haze of Silquest A-1100 silane, as measured by Hach number, when compared with Chinese and European competitors' products. Hach number, a typical measurement of the amount of dispersed particles in the water solution of the silane, is a quantitative measurement of the haze of the aqueous silane solution. Our upper specification limit (USL) for Hach number is less than or equal to 3.

Silquest A-1100 silane is completely and immediately soluble in water (with reaction), alcohol and aromatic and aliphatic hydrocarbons. Ketones are not recommended as diluents. Hydrolysis is noticeably exothermic and releases ethanol.

### Figure 1. The Hach numbers of aqueous solutions Silquest A-1100 silane and several competitive aminosilane offerings



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