

# XIAMETER<sup>®</sup> OFS-6011 Silane

## Amino functional alkoxy silane

### FEATURES

- High purity
- Amino reactive group
- Triethoxy functional

### BENEFITS

- Improved adhesion
- Increased composite wet and dry tensile strength and modulus
- Increased composite wet and dry flexural strength and modulus
- Increased wet and dry compressive strength
- Increased transparency of fiberglass composites

### COMPOSITION

- Aminopropyltriethoxysilane

### APPLICATIONS

- Coupling agent to improve adhesion of many plastics, resins and elastomers to inorganic materials and surfaces
- Useful for improving the properties of mineral filled rubber
- Additive for foundry resins

### TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local XIAMETER sales representative prior to writing specifications on this product.

| Test                              | Unit    | Value                                |
|-----------------------------------|---------|--------------------------------------|
| Appearance                        |         | Colorless to very pale yellow liquid |
| Viscosity at 25°C (77°F)          | cst     | 1.6                                  |
| Specific Gravity at 25°C (77°F)   |         | 0.946                                |
| APHA Color                        |         | <25                                  |
| Flash Point, Setaflash closed cup | °C (°F) | 96 (205)                             |
| Purity by GC                      | %       | >98.5                                |
| Molecular weight                  | g/mol   | 221.37                               |
| CAS #                             |         | 919-30-2                             |

### DESCRIPTION

XIAMETER<sup>®</sup> OFS-6011 Silane is a reactive chemical containing an aminopropyl organic group and a triethoxysilyl inorganic group. Chemically, XIAMETER OFS-6011 Silane is designated gamma-aminopropyltriethoxysilane (fw 221.4).

Possessing both organic and inorganic reactivity, XIAMETER OFS-6011 Silane can react with organic resins and elastomers as well as with the surface of inorganic materials such as fiberglass and silica.

XIAMETER OFS-6011 Silane is particularly recommended for fiberglass-reinforced phenolic, melamine, and epoxy thermoset composites, either as a fiberglass finish or as a resinous additive. Data suggests that this silane can also

improve the performance of these types of thermoset resins when used as mineral binders in foundry and abrasive composite applications.

When used as a resin additive, generally the silane is added at a level of 1 percent based on the weight of the resin solids. For each specific application, the optimum level of additive should be determined by testing several concentrations. When used as an additive to epoxy coating, XIAMETER OFS-6011 Silane improves adhesion of the coating, particularly in very humid environments.

XIAMETER OFS-6011 Silane has also been found to be an effective coupling agent for clay-reinforced elastomers such as natural and nitrile rubber. The silane-treated clay

provides improvement in both physical and dynamic properties compared with similar cured elastomers containing untreated clay.

XIAMETER OFS-6011 Silane will also improve the adhesion of many coatings (urethanes, epoxies, phenolics, and others) to glass and metal surfaces. Best performance is realized when XIAMETER OFS-6011 Silane is used as a primer, although addition to the coating can also give benefits.

## HOW TO USE

XIAMETER OFS-6011 Silane can be applied to inorganic surfaces as a dilute aqueous solution (0.1 to 0.5 percent silane). Aqueous solutions can be prepared by simply adding the silane to water and stirring. (CAUTION: Poor agitation when adding XIAMETER OFS-6011 Silane to water can result in locally high concentration that may form gel particles.) It is commonly recommended that the silane solution be acidified to a pH of 3.5 to 6 (3.5 to 4 is optimal) with an organic acid such as acetic or oxalic<sup>1</sup>, to obtain optimum performance of reinforcing material such as fiberglass.

Inorganic surfaces can be treated with the aqueous solution by any suitable method. In the case of siliceous mineral fillers, the mineral can be treated by slurring in the aqueous solution or mixing with the silane at very high shear (with a Waring<sup>2</sup> or Welex<sup>3</sup> blender) as a 10 percent solution in isopropanol or etherglycol.

After applying this silane, the glass or mineral surface can be air-dried or dried briefly at 105 to 121°C (220 to 250°F) to effect complete condensation of silanol groups at the surface and to remove water and/or traces of ethanol from hydrolysis. Optimum application and drying conditions, such as time and temperature, should be determined for each application before use in a commercial process.

For use as a primer, two methods are suggested:

### Method 1:

Dissolve 5 percent XIAMETER OFS-6011 Silane in isopropyl alcohol; wipe onto the glass or metal substrate; dry at 75C (167F) for 15 minutes; then apply coating.

### Method 2:

To 40 percent XIAMETER OFS-6011 Silane in isopropanol, add 5 percent water; allow to stand for 6 hours; dilute to 5 percent active with isopropyl alcohol; then apply as in method 1.

## PRODUCT SAFETY INFORMATION

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL, ENVIRONMENTAL, AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE XIAMETER WEBSITE AT [WWW.XIAMETER.COM](http://WWW.XIAMETER.COM).

## USABLE LIFE AND STORAGE

When stored at or below 25°C (77°F) in the original unopened containers, these products have a usable life of 12 months from the date of production. After opening, avoid exposure to atmospheric moisture to prevent gelation.

## LIMITATIONS

This product is neither tested nor represented as suitable for medical or Pharmaceutical uses.

## LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

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