



Technical Data Sheet

XIAMETER™ OFS-6011 Silane

XIAMETER™ OFS-6610 Silane

Amino functional alkoxysilane

Features & Benefits

- High Purity
- Amino reactive group
- Trialkoxy functional
- Improved adhesion
- Increased composite wet and dry tensile strength and modulus
- Increased composite wet and dry flexural strength and modulus
- Increased transparency of fiberglass composites

Composition

- XIAMETER™ OFS-6011 Silane
 - Aminopropyltriethoxysilane
- XIAMETER™ OFS-6610 Silane
 - Aminopropyltrimethoxysilane

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.

CTM ¹	ASTM ²	Property	Unit	Result	
				XIAMETER OFS-6011 Silane	XIAMETER OFS-6610 Silane
0004	D445	Viscosity at 25°C (77°F)	cst	1.6	1.6
0001A	D1298	Specific Gravity at 25°C (77°F)		0.946	0.946
0005	D1209	APHA Color		< 25	< 25
0176		Appearance		Colorless to very pale yellow liquid	Colorless to very pale yellow liquid
0053		Purity by GC	%	> 98.5	> 98.5

1. CTM : Corporate Test Method, available upon request
2. ASTM: American Society for Testing and Materials

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Typical Properties (Cont.)

CTM	ASTM	Property	Unit	Result	
			XIAMETER OFS-6011 Silane		XIAMETER OFS-6610 Silane
0917		Flash Point (Setaflash closed cup)	°C (°F)	96 (205)	
		Flash Point (TAG closed cup)	°C (°F)		82 (180)
		Molecular Weight	g/mol	221.37	179.29
		CAS #		919-30-2	13822-56-5

Description

XIAMETER OFS-6011 Silane and XIAMETER OFS-6610 Silane are reactive chemicals containing an aminopropyl organic group and a trialkoxysilyl inorganic group. Chemically XIAMETER OFS-6011 Silane and XIAMETER OFS-6610 Silane are designated gamma-aminopropyltriethoxysilane and gamma-aminopropyltrimethoxysilane (fw 221.4).

Possessing both organic and inorganic reactivity these silanes can react with organic resins and elastomers as well as with the surface of inorganic materials such as fiberglass and silica.

These aminopropyl functional silanes are in a series of XIAMETER™ organofunctional silane chemicals. Other reactive silanes include di-amine (DOWSIL™ Z-6020 Silane), methacrylate (DOWSIL™ Z-6030 Silane), epoxy (DOWSIL™ Z-6040 Silane), vinyl (DOWSIL™ Z-6300 Silane and XIAMETER™ OFS-6518 Silane), chloroalkyl (DOWSIL™ Z-6076 Silane and DOWSIL™ Z-6376 Silane), and vinylbenzylamine (XIAMETER™ OFS-6032 Silane and XIAMETER™ OFS-6224 Silane).

Recommended Uses

XIAMETER OFS-6011 Silane and XIAMETER OFS-6610 Silane are particularly recommended for fiberglass- reinforced phenolic, melamine, and epoxy thermoset composites, either as a fiberglass finish or as a resinous additive. Data suggests that these silanes 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% based on the weight of the resin solids. For each specific application, the optimum level should be determined by testing several concentrations. When used as an additive to an epoxy coating, the 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 and XIAMETER OFS-6610 Silane will 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 and XIAMETER OFS-6610 Silane are used as primers, although addition to the coating can also give benefits.

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How To Use

XIAMETER OFS-6011 Silane and XIAMETER OFS-6610 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 and XIAMETER OFS-6610 Silane to water can result in locally high concentrations 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, 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 slurrying in the aqueous solution or mixing with the silane at very high shear (with a Waring® or Welex® blender) as a 10 percent solution in isopropanol or etherglycol.

After applying these silanes, 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 alcohol 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 silane in isopropyl alcohol; wipe onto the glass or metal substrate; dry at 75°C (167°F) for 15 minutes or at room temperature for 30 minutes; then apply coating.

Method 2

Prepare a solution of 40 percent silane in isopropyl alcohol; add 5 percent water and allow to stand for 6 hours; dilute to 5 percent active with isopropyl alcohol; then apply as in method 1.

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT WWW.CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life And Storage

Product should be stored at or below 25°C (77°F) in original, unopened containers.

XIAMETER OFS-6011 Silane and XIAMETER OFS-6610 Silane generate alcohol (ethanol and methanol respectively) upon exposure to moisture. Appropriate ventilation should be provided to prevent the accumulation of hazardous concentrations of fumes in the working environment.

Limitations

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

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<http://www.xiameter.com>

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