Technical Data Sheet

Silquest* A-1170

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Description

Silquest A-1170, Silquest Y-9627 and Silquest Y-11699 silanes are secondary aminofunctional bis-silanes. This category of silanes is generally useful to consider for a broad range of applications to promote adhesion in coatings, adhesives and sealants between organic polymers and glass, metal, wood or cast plastic substrates.

Typically, they can function as coupling agents to particulate mineral fillers in composites, as in foundry molds and cores, to improve mechanical properties such as tensile and flexural strengths.

These property improvements have been maintained in the presence of aggressive environments, such as high temperature and high humidity conditions.

Key Features and Benefits

- Bis-silyl functionality - generally affords greater bonding or adhesion promotion to inorganic substrates.
- Secondary amino functionality - can typically improve shelf stability in various resin systems.
- Methoxy silane ester versions Silquest A-1170 silane and Silquest Y-9627 silane generally offer fast reaction with moisture, which translates to rapid cure or adhesion build.
- Ethoxy silane ester version Silquest Y-11699 silane generally provides a controlled cure with a by-product of the coupling or crosslinking mechanisms that have a lower impact on the environment.

Typical Physical Properties

Property	Silquest A-1170 silane	Silquest Y-9627 silane	Property	Silquest Y-11699
Appearance	Clear liquid	Clear liquid	Appearance	Clear liquid
Color	Clear, pale	Straw to dark	Color	Pale
Odor	Ester	Ester	Odor	Ester
Percent Actives	100	100	Percent Actives	100
Density, g/cm^3	1.04	1.03	Density, g/cm^3	0.968
Percent Purity	> 95 / 90	> 95 / 90	Flash Point, Estimated, ASTM D93, °C (°F)	> 93 (200)
Specific Gravity, 25/25°C	1.0423	1.0423	Boiling Point, °C	>150
Flash Point, PMCC, ASTM Method D 93, °C (°F)	112.7 (235)	82 (179.6)	Freezing Point, °C (°F)	< 0 (32)
Boiling Point, at 4mm Hg, °C (°F)	152 (306)	>100 (>212)	Molecular Weight, g/mole	425.5
Molecular Weight, g/mole	341.5	341.5		

*Silquest is a trademark of Momentive Performance Materials Inc.

Potential Applications

Amino bis-silanes such as Silquest A-1170, Silquest Y-9627 and Silquest Y-11699 silanes have been shown to be effective in reacting with epoxy, urethane, melamine, polyimide, phenolic and furan thermosetting resins as well as many thermoplastics, such as polyamides and polyesters.

Durable water-resistant bonds are generally achieved when the silyl portion of these aminosilanes are condensed with an inorganic surface and are covalently bonded with the resin matrix of the composite, paint, adhesive or sealant.

The bis-alkoxysilane structure of the Silquest A-1170, Silquest Y-9627 and Silquest

Y-11699 silanes result in the addition of two silyl groups to a resin. This typically yields more durable wet adhesion and more efficient bonding per mole of added silane.

The ethoxy ester groups, as on Silquest Y-11699 silane, generally provide slower reaction with moisture, giving longer shelf stability when exposed to incidental or atmospheric moisture on storage.

The Silquest A-1170 silane and Silquest Y-9627 silane, as the methoxy ester versions, generally offer a quick cure and or rapid adhesion build.

The higher purity grade of Silquest A-1170 silane may be considered for applications which demand low color, and greater control of reaction stoichiometry.

Silquest Y-9627 silane may be considered for similar reactivity with potential savings.

These versatile silanes typically can be added directly to polymers during system formulation, or used independently as primers.

Typical Sealant Application – Adhesion to Cast Plastics

The Effect of Silquest A-1170 / Silquest Y-9627 Silanes on Adhesion of Filled RTV Silicone to Plastic Substrates

	Adhesion, pli w/ Silquest A-1170 or Silquest Y-9627 Silanes		**Control**	
Substrate	**Wet**	**Dry**	**Wet**	**Dry**
ABS	17	24	0.1	0.1
PVC	29	32	1.3	0.5
Styrene	31	31	1.1	0.5
Acrylic	26	36	0.5	0.5

Note: Test data. Actual results may vary.

Typical Foundry – Sand Mold Compounds

FURAN			**PHENOLIC**		
		Parts By Weight			**Parts By Weight**
Furfuryl Alcohol/ Phenol Resin		2.0	Resin		1.0
Silica Foundry Sand		100.0	Silica Foundry Sand		100.0
Silquest A-1170 / Silquest Y-9627 Silanes		**0.10**	**Silquest A-1170 / Silquest Y-9627 Silanes**		0.1
Hardener		0.60	Benzene Sulfonic Acid		0.4
Measured Properties			Measured Properties		
	No Silane	**Silane**		**No Silane**	**Silane**
Flexural Strength, Initial (psi)	142	187	Tensile Strength, Initial	11.0	53.0
Flexural Strength, Aged in resin -2 months	77	130	Tensile Strength, Aged in 2 months	16.0	69.0

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Standard copy to come

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