

Silquest^{*} A-151, Silquest A-171^{*} and Silquest A-2171 Silane

Product Description

Silquest A-151 silane, Silquest A-171 silane and Silquest A-2171 silane offer vinyl and silane functionality, making them excellent candidates for crosslinking organic polymers. Similarly, Silquest A-2171 silane is useful as a crosslinker in systems where greater elongation is required. It may also be useful for chain extension of RTV silicones or other silane or OHfunctional polymers. The resulting Si-O-Si crosslink sites are highly resistant to exposure to moisture, chemicals and UV. Siloxane crosslinks tend to not generate color and are resistant to acid rain.

Silquest A-171 silane may also be useful as a moisture scavenger in moisture cure systems where enhanced shelf-life is sought.

Key Features and Typical Benefits

Silquest A-151 Silane

Feature	Benefit
Vinyl Functionality	<ul style="list-style-type: none">• Vinyl functionality allows free radical addition to polymers.• Vinyl functionality increases the rate of silane hydrolysis.
Triethoxy Silane Functionality	<ul style="list-style-type: none">• Bonds to inorganic substrates to provide excellent wet and dry adhesion.• Fast hydrolysis rate.• Functions as a crosslinker.

Momentive Performance Materials provides versatile materials as the starting point for our creative approach to ideas that help enable new developments across hundreds of industrial and consumer applications. We are helping customers

solve product, process, and performance problems; our silanes, fluids, elastomers, sealants, resins, adhesives, urethane additives, and other specialty products are delivering innovation in everything from car engines to biomedical devices.

From helping to develop safer tires and keeping electronics cooler, to improving the feel of lipstick and ensuring the reliability of adhesives, our technologies and enabling solutions are at the frontline of innovation.



Silquest* A-151, Silquest A-171* and Silquest A-2171 Silanes

Key Features and Typical Benefits (continued)

Silquest A-171 Silane

Feature	Benefit
Vinyl Functionality	<ul style="list-style-type: none">• Allows free radical addition to polymers.• Increases the rate of silane hydrolysis.
Triethoxy Silane Functionality	<ul style="list-style-type: none">• Bonds to inorganic substrates to provide excellent wet and dry adhesion.• Functions as a crosslinker.• Useful as a moisture scavenger.

Silquest A-2171 Silane

Feature	Benefit
Vinyl Functionality	<ul style="list-style-type: none">• Allows free radical addition to polymers.• Increases the rate of silane hydrolysis.
Triethoxy Silane Functionality	<ul style="list-style-type: none">• Bonds to inorganic substrates to provide excellent wet and dry adhesion.• Can function as a chain extender or crosslinker in RTV silicone sealants.• Used as a monomer in vinyl/acrylic resins. It supplies two crosslink sites per silane resulting in decreased crosslink density, improving elongation performance of cured resin.• Methoxy groups offer rapid hydrolysis.

Typical Physical Properties

	Silquest A-151 Silane	Silquest A-171 Silane	Silquest A-2171 Silane
Appearance	Colorless to Light Straw	Colorless to Light Straw	Colorless to Light Straw
Specific Gravity at 25/25°C	0.91	0.97	0.88
Refractive Index n_D 25°C	1.397	1.3905	—
Flash Point, Tag Closed Cup, °C (°F)	44 (111)	28 (82)	8 (46)
Boiling Point, °C (°F)	160.5 (321)	122 (252)	106 (223)

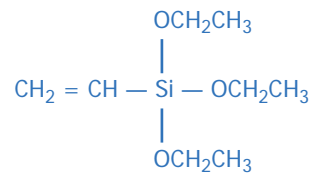
Solubility

Momentive Performance Materials family of vinyl Silquest silanes are soluble in water after they have been hydrolyzed. Hydrolyzing Silquest A-151 silane, Silquest A-171 silane or Silquest A-2171 silane in water is aided by adjusting the pH of the water to 5.0-5.5 with acetic acid prior to adding the silane.

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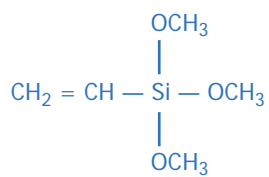
Chemical Structures

Silquest A-151 Silane



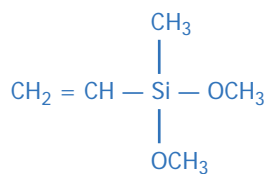
Vinyltriethoxy Silane

Silquest A-171 Silane



Vinyltrimethoxy Silane

Silquest A-2171 Silane



Vinylmethyldimethoxy Silane

Silquest* A-151, Silquest A-171* and Silquest A-2171 Silanes

Potential Applications

Crosslinking with the Momentive Performance Materials family of vinyl Silquest silanes

Silquest A-151 silane, Silquest A-171 silane and Silquest A-2171 silane are monomeric vinyl functional silanes in vinyl, vinyl acrylic and acrylic resins. The vinyl silanes can be added as monomers during emulsion polymerization to form silane modified latexes. The silanes in such latexes function as crosslinkers, forming very stable Si-O-Si linkages.

Vinyl silanes can also be grafted to select unsaturated polymers such as polyethylene, polyester, and styrene-butadiene co-polymers, via free radical chemistry. Once grafted to the resin, the resin exhibits silane functionality through which the resin can be crosslinked via an ambient moisture cure mechanism. This approach can be utilized to provide improved high temperature resistance, tensile and tear strengths to thermoplastic resin-based materials.

With the addition of an adhesion promoting silane, such as Silquest A-1110 silane or Silquest A-1120 silane, excellent adhesion to a wide array of substrates can be obtained (Note: See literature on SPUR* prepolymer-based technology for additional information on synergistic use of Silquest silane crosslinkers and adhesion promoters for excellent adhesion to difficult substrates). This approach may be suitable to warm applied hot melt adhesive and sealant applications.

Chain Extending with Momentive Performance Materials vinyl functional Silquest silanes

In RTV silicone sealant formulations, Silquest A-2171 silane acts as a chain extender. Crosslink density can be balanced by adjusting the ratio of Silquest A-2171 silane with higher functional Silquest silane crosslinkers such as Silquest A-171 silane (tri methoxy functional) and Silquest Y-11683 silane (penta-ethoxy functional disilane).

Moisture Scavenging with Momentive Performance Materials vinyl functional Silquest silanes

The electron withdrawing effect imparted by the silanes vinyl functionality enhances the rate of hydrolysis. This increased reactivity makes Silquest A-171 silane one of the fastest hydrolyzing alkoxy silanes available. The elevated rate of hydrolysis is sufficient to enable Silquest A-171 silane to be utilized as a moisture scavenging agent in moisture sensitive systems.

Silquest A-171 silane can be incorporated into urethane, silylated polyurethane (SPUR prepolymer) or other silane modified polymer based sealants and adhesives to extend the systems shelf-life.

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Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Product Safety, Handling and Storage

Customers considering the use of this product should review the latest Material Safety Data Sheet and label for product safety information, handling instructions, personal protective equipment if necessary, and any special storage conditions required. Material Safety Data Sheets are available at www.momentive.com or, upon request, from any Momentive Performance Materials representative. Use of other materials in conjunction with Momentive Performance Materials products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Limitations

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At sea	Radio U.S. Coast Guard, which can directly contact Momentive Performance Materials at 518.233.2500 or CHEMTREC at 800.424.9300.	

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