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# Silquest\* Y-15744 Silane

Adhesion Promoter for Sealants, Adhesives and Coatings on Porous and Other Difficult Substrates

## Product Description

Silquest Y-15744 silane is an amino functional silane oligomer that is an excellent candidate to consider for use in a broad range of applications to promote adhesion between organic / inorganic substrates and organic polymers including, but not limited to, in moisture curing formulations such as hybrid or silicone-based sealants, adhesives and coatings.

Its proprietary structure can help confer good wetting properties to the adhesive or sealant formulation in which it is incorporated.

This typically results in:

- Adhesion on concrete and difficult, low polarity substrates
- Moderate hydrophobicity with little impact on the formulation curing rate
- Improved adhesion in wet environments

## Key Features and Typical Benefits

The chemical properties of Silquest Y-15744 silane typically offer improved performance as an adhesion promoter on both porous and difficult organic substrates.

- Primary Amino Groups – Co-catalytic effect for curing of the coating, adhesive or sealant formulation
- Methoxy Silane Ester – Rapid attainment of bond strength
- Ability to improve wetting properties, even on substrates with low surface tension.
- Improved adhesion on damp masonry and concrete
- Strong, weather resistant bonds

## Typical Physical Properties

Physical Form	Light yellow liquid
Percent Active Material	100
Specific Gravity, 25/25°C	1.01
Flash Point, Pinsky-Martens Closed Cup, <sup>(1)</sup> °C (°F)	80 (176)
Boiling Point at 4.0 mm Hg, °C (°F)	>210 (>392)

(1) ASTM Method D93

Typical physical property values should not be used as specifications.

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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.

## Product Description (continued)

The typical mechanical properties of this adhesion promoter are similar to, or only slightly softer than, those achieved when Silquest A-1110 aminopropyltrimethoxysilane is at the same addition level. However, adhesion to low polarity plastics typically is significantly better.

In some filled formulations, it has been observed that Silquest Y-15744 silane can help improve the compatibility between the resin and the fillers. This can result in an increased transfer of mechanical strength from the mineral to the formulation. In those cases, a better tear resistance and higher toughness have been observed in the cured product.

## Potential Applications

For adhesives, sealants and coatings, Silquest Y-15744 silane may be considered for achieving weather- and moisture-resistant bonds to substrates such as glass, metal, but also on more difficult surfaces like concrete and plastics. Durable water-resistant bonds are generally achieved when the silyl portion of this aminosilane is condensed with an inorganic surface and is covalently bonded with the resin matrix of the coating, sealant or adhesive. The typical addition level of this product lies between 0.5 and 1.0%, based on the total formulation.

## Example Sealant Formulation

The following sealant formulation was used to evaluate the performance of Silquest Y-15744 silane.

**Table 1: Sealant Formulation**

	Percentage
SPUR+* 1015 LM prepolymer	23.14%
Plasticizer	18.51%
UV Stabilizer	0.46%
Thixotropic Agent	0.23%
Titanium Dioxide	1.16%
Calcium Carbonate	55.05%
Moisture Scavenger (Silquest A-171* silane)	0.35%
Adhesion Promoter	0.58%
Catalyst	0.05%

SPUR+ 1015 LM prepolymer and Silquest A-171 silane are available from Momentive Performance Materials.

Product formulations are included as illustrative examples only. Momentive makes no representation or warranty of any kind with respect to any such formulations, including, without limitation, concerning the efficacy or safety of any product manufactured using such formulations.

The physical properties of one-part SPUR+ prepolymer-based sealant incorporating Silquest Y-15744 silane were evaluated using European test methods ISO 37, 868.

Silquest Y-15744 silane was compared with Silquest A-1110 silane (aminopropyltrimethoxysilane), the most commonly used amino silane adhesion promoter in hybrid sealants.

**Table 2: Impact of Silquest Y-15744 silane on Sealant Mechanical Properties<sup>(1)</sup> Compared to Silquest A-1110 silane:**

Adhesion Promoter	Unit	Silquest A-1110 silane	Silquest Y-15744 silane
F max	N/mm <sup>2</sup>	2.18	1.92
F at rupture	N/mm <sup>2</sup>	2.15	1.84
Elongation	%	378	384
Mod 100	N/mm <sup>2</sup>	1.02	0.9
Shore A	-	35.5	34.3
TFT (Skin formation time)	Min	55-60	55-60
Aspect		Good	Good

(1) The numbers reported in this table represent average values measured on the cured formulation described in Table 1.

Note: Test data. Actual results may vary.

**Table 3: Adhesion Properties on Dry Substrates (ISO 8510-2)<sup>(2)</sup>**

Adhesion Promoter	Silquest A-1110 silane		Silquest Y-15744 silane	
	N/mm	% of cohesive failure	N/mm	% of cohesive failure
Concrete ISO 13640 type 1	1.85	80	1.93	95
Concrete ISO 13640 type 2	2.13	80	2.04	90
Glass	1.61	100	1.60	100
Aluminum	1.65	100	1.89	100
AlMg1 (alloy 5005 A – windows grade)	2.42	100	2.17	100
Galvanized Steel	1.93	100	1.95	100
Stainless Steel	1.77	100	1.93	100
ABS	0.12	0	<b>1.70</b>	<b>100</b>
PS	1.05	0	<b>2.01</b>	<b>100</b>
PA6	1.89	100	2.06	100
PC	2.04	100	1.79	100
POM (polyoxymethylene)	0.80	0	<b>1.55</b>	<b>50</b>
PMMA	0.64	0	<b>2.16</b>	<b>100</b>
PVC Rigid (CAW Simona)	2.72	100	1.98	100
PVC Soft	1.15	50	<b>1.48</b>	<b>100</b>

(2) The numbers reported in this table represent average values measured on the cured formulation described in Table 1.

Note: Test data. Actual results may vary.

\*Silquest, Silquest A-171 and SPUR+ are trademarks of Momentive Performance Materials Inc.

## Potential Applications (continued)

**Table 4: Adhesion Properties on Wet Substrates (ISO 10591)<sup>(2)</sup>**

Adhesion Promoter	Silquest A-1110 silane		Silquest Y-15744 silane	
	N/mm	% of cohesive failure	N/mm	% of cohesive failure
Concrete ISO 13640 type 1	0.72	10	<b>1.23</b>	20
Concrete ISO 13640 type 2	0.49	0	<b>1.11</b>	5
Glass	1.80	100	2.35	100
Aluminum	1.48	100	2.08	100
AlMg1 (alloy 5005 A – windows grade)	1.86	100	1.86	100
Galvanized Steel	1.81	100	1.83	100
Stainless Steel	1.72	100	1.92	100
ABS	0.18	0	<b>1.37</b>	<b>75</b>
PS	0.12	0	<b>1.17</b>	<b>50</b>
PA6	1.68	100	2.06	100
PC	1.60	100	1.98	100
POM (polyoxymethylene)	0.73	0	<b>1.13</b>	<b>40</b>
PMMA	0.72	0	<b>1.85</b>	<b>100</b>
PVC Rigid (CAW Simona)	2.21	100	1.75	100
PVC Soft	1.32	50	<b>1.47</b>	<b>100</b>

(2) The numbers reported in this table represent average values measured on the cured formulation described in Table 1.

Note: Test data. Actual results may vary.

## Patent Status

Technical subject matter in this publication is described and protected by one or more pending US patent applications and foreign counterparts.

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