

FOR IMMEDIATE RELEASE:

8-CARBON SILANES CREATE SPACE: SHIN-ETSU

SILICONES LAUNCHES A NEW LINE OF LONG-CHAIN SPACER TYPE SILANE COUPLING AGENTS OFFERING INCREASED HYDROPHOBICITY AND FLEXIBILITY.

Akron, OH—June 2018

Shin-Etsu Silicones of America, Inc. (SESA: A U.S. subsidiary of Shin-Etsu Chemical Co. Ltd., Japan) recently introduced their uniquely advanced 8-Carbon Silane Coupling Agents during the American Coatings Show in Indianapolis, IN (Indiana Convention Center, April 10-12).



New to the Coatings, Adhesives, and Sealants industries, the KBM-1083 (olefinic functional) and KBM-4803 (epoxy functional) lines have eight carbons – creating more space between the reactive ends of the silanes. Typical silane coupling agents have three carbons separating the organic functional group from the inorganic silicon end. These traditional 3-carbon spacer silanes create a tighter, more rigid network than their 8-carbon counterparts.

The result of this ‘greater space’ presents a significant myriad of benefits that can be formulated into a wide variety of chemistries for Coatings, Adhesives, Sealants, and PSA applications including:



- Increased Reactivity due to easier access to the reactive group
- Improved Adhesion
- Enhanced flexibility of the cured resin
- Higher filler content enabled
- Greater alkali resistance
- More compatibility with plastics

KBM-1083 PROFILE: (OLEFINIC FUNCTIONAL)

General Properties (not specified values):

Purity (GC%) 90 or higher
Viscosity (25C) 1.8cSt

Expected Effects:

Enables higher filler contents
Increased flexibility of cured resin
Increased alkali resistance and water resistance

KBM-4803 PROFILE: (EPOXY FUNCTIONAL)

General Properties (not specified values):

Purity (GC%) 95 or higher
Viscosity (25C) 6.6cSt

Expected Effects:

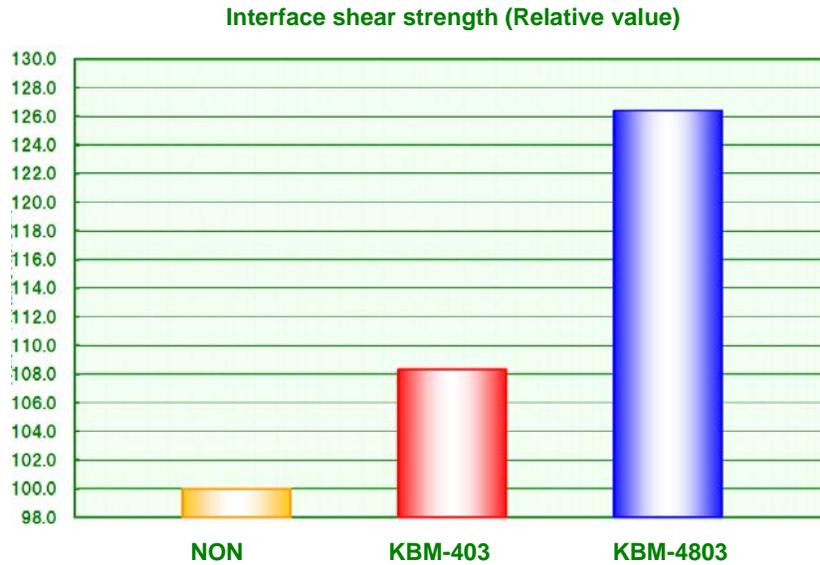
Increased adhesion
Increased flexibility of cured resin
Increased alkali resistance and water resistance
Enables higher filler contents

The following data demonstrates the many advantages of 8-Carbon Silane Coupling Agents:

Tack Free Comparison: The use of KBM-1083 resulted in a Tack Free time that was one-fifth of that using a typical Silane Coupling Agent—KBM-1003—and the Alkali resistance was improved.

SESA / TACK FREE TIME COMPARISON OF SILANE MODIFIED SILICONE OLIGOMERS	Modified by KBM-1083 (n=2)	Modified by KBM-1003 (n=2)	Base Silicone Oligomer
Tack Free Time	2 Min	10 Min	30 Min
Alkali Resistance ⁴⁾	OK	NG	NG

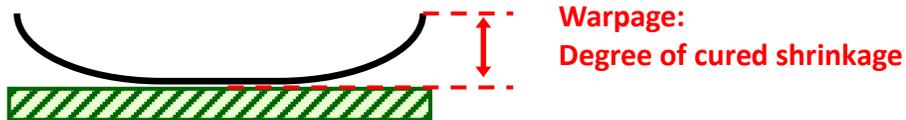
Glass-Epoxy Coupling Performance: KBM-4803 accounted for an 18% improvement in interfacial shear strength compared to KBM-403. The product is not water-soluble and has been successfully used in dental, electronics, and aerospace applications.



Note: The gold bar is no silane, the red bar is typical silane, the blue bar is the 8-Carbon Silane. A 10% increase is a significant improvement. SESA’s KBM-4803 is 18% better—showing extraordinary adhesion strength improvement as a primer.

Cured Resin Film Test: Due to its longer molecular chain, the KBM-4803 shrank less than the KBM-403 in the Cured Film test resulting in no observed warpage.

SESA / CURED RESIN FILM TEST	KBM-4803 Resin	KBM-403 Resin
Pencil Hardness	3H	5H
Warpage	Not observed	Observed

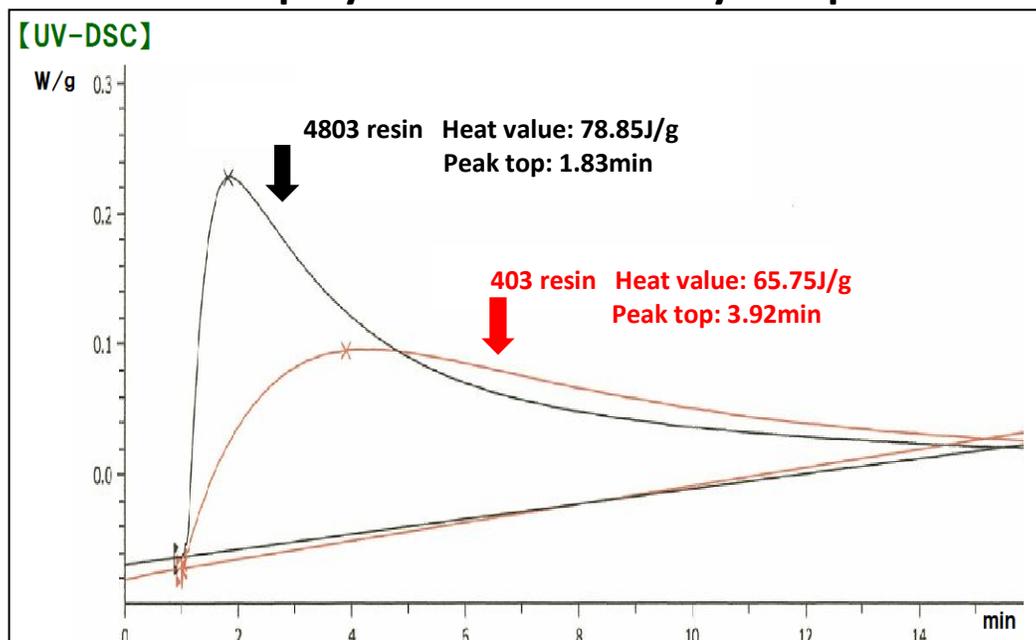


Silica Treatment: Fumed silica was treated with both KBM-4803 and KBM-403 and compounded with multi-functional epoxy at 10% loading. The viscosity of the compound with KBM-4803 was less than half of that with the traditional silane. The benefit is faster blending with less energy required.

Sample	Viscosity (Pa·s)
Treated with 4803	120
Treated with 403	260

Cationic Polymerization Activity: KBM-4803 exhibits higher polymerization activity compared to KBM-403 as evidenced by the higher Heat Value and the shorter Peak Time.

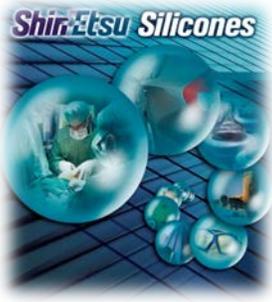
<Cationic polymerization activity comparison>



According to SESA's International Business Development Manager for Silanes Technology, Michael Gunther, Ph.D., "Ultimately, this new line of long-chain spacer type 8-Carbon Silane Coupling Agents represents a great addition to SESA's growing silane product portfolio in North America. We are confident that their increased hydrophobicity and flexibility will provide formulators infinite product options and advantages across a vast array of applications in the Coatings, Adhesives, and Sealants market segments."

For more detailed information, visit the Shin-Etsu Silicones web site at:

<http://www.shinetsusilicones.com>



CORPORATE PROFILE:

A U.S. subsidiary of Shin-Etsu Chemical Co. Ltd., Japan, Shin-Etsu Silicones of America Inc. offers vast technical and capital resources to formulate solutions as a major supplier of silicone materials to North America's medical, automotive, electronics, aerospace, cosmetics, and manufacturing industries. Shin-Etsu's premium silicone compounds incorporate leading-edge technology, staff expertise, and value-added service; offering customers the highest levels of quality and consistency in specialty silicone materials.

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