Solution Case Study
Formulate VOC-Reduced SMP Based Adhesives and Sealants and Silicones with Excellent Mechanical Properties

Technology
Dynasylan® organofunctional silanes

Key adhesives and sealants technologies
• Silane modified polyurethane/polyether (SMP)
• MS Polymer
• RTV-1/RTV-2 oxime- and alkoxy-silicones

Markets
Construction, transportation, do-it-yourself, industrial assembly

Key benefits
• Improved adhesion to plastics, especially to polycarbonate (PC)
• High tensile strength in SMP
• Well-balanced mechanical properties in silicones
• > 50 % VOC-reduction compared to traditional aminosilanes
• Without regards to other raw materials, add up to 30 % VPS SIVO 260 without labeling

The challenge
Adhesion on critical substrates like plastics is a key challenge in the adhesive industry. It comes along with the difficult task to keep other performances like mechanical properties at a suitable level. What if you could go even beyond and get adhesion on critical substrates along with increased mechanical properties and VOC-reduction?

The solution
You can now develop adhesives, sealants and silicones with increased adhesion performance, excellent mechanical properties within an environmentally friendly formulation. Indeed, with VPS SIVO 260, you now get up to 27 % adhesion increase on PC and achieve higher strength by higher flexibility in silicones. Not only it enables the formulation of environmentally friendly products, it usually allows labeling free adhesives or sealants.

This unique combination of performances enables:
• Longer product lifecycle
• Higher endurance to vibration, stress, temperature variation
• The possibility to bond complex substrates to broaden the application
• Providing of environmentally friendly and labeling free final products
Excellent adhesion performance on metal and plastics
With VPS SIVO 260, formulated in SMP products or RTV-silicones, excellent adhesion on a wide variety of substrates like metal and low energy plastic surfaces (e.g. PVC, PET) can be achieved.

As shown in the figure below, a STPU adhesive with VPS SIVO 260 exhibits an outstanding adhesion on PC with +27 % compared to standard aminosilanes:

![Graph showing lap shear comparison](image1)

In addition, the final STPU adhesive showed better adhesion on aluminum with +29 % adhesion performance vs. standard aminosilanes, too:

![Graph showing lap shear comparison on aluminum](image2)

Excellent performance in silicones: adhesion and mechanical performance at its best
With VPS SIVO 260, formulated in RTV-silicones, you can achieve excellent adhesion and mechanical performance.

In oxime silicones, VPS SIVO 260 improves the mechanical properties positively. So you can achieve higher strength by higher flexibility. The tear and tensile strength are respectively increased by 35 % and 25 % with VPS SIVO 260 vs. standard aminosilanes.

![Graph showing tear and tensile strength](image3)

MS-polymer adhesives showed also improved adhesion on plastics e.g. PVC with +45 % compared to standard aminosilanes
Moreover, the elongation at break is increased by 60 % with VPS SIVO 260:

![Graph showing elongation at break (%) and Modulus 100% elongation (N/mm²) in a cured oxime silicone (adhesion promoter = 1 %)](image)

In addition, thanks to VPS SIVO 260, the final oxime silicone showed a better adhesion on PVC compared to standard aminosilanes:

![Graph showing Lap shear strength (N/mm²) in a cured oxime silicone on PVC (adhesion promoter = 1 %)](image)

Additional advantages are provided by VPS SIVO 260:
- Low volatile adhesion promoter for the use in odor reduced hotmelt formulations
- Environmentally friendly silane, due to significant VOC-reduction compared to conventional aminosilanes

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