SMP
FOR RV AND TRAILER APPLICATIONS
SILYL-MODIFIED POLYMER

Moisture cure sealants and adhesives have been used in the RV and trailer industries for the past 20 years. The dominant chemistries in these applications have historically been polyurethane, silicone, and waterbased adhesives. Bostik is proud to offer a relatively new chemistry that provides differentiated advantages not available from the chemistries used in the past. This chemistry is known as SMP, or Silyl-Modified Polymer.

SMP adhesives are created from a base raw material called MS Polymer (Modified Silicone). This raw material was developed by Kaneka Co. in 1979, and Bostik developed its first product with this polymer in 1987. Basically, an SMP adhesive combines many of the advantages of silicone and polyurethane to form a product that is ideal for many RV and trailer applications.

BELOW IS MORE SPECIFIC INFORMATION ABOUT HOW SMP CHEMISTRY PERFORMS IN SOME “HIGH NEED” AREAS.

HIGH TEMPERATURE RESISTANCE

Bostik’s SMP technology can have a temperature resistance over a longer period of time up to approximately 250°F. Compared to PU adhesives, the resistance can be around 80°F higher. This is very beneficial for “high temperature regions” in the world. For example, we have seen temperatures on dark-coated vehicles or on the black ceramic frit coatings of windows which can go up to 175°F or 195°F. If the adhesive or sealant is continually exposed to these influences over a long period of time, aging and movement in the constructions will influence the strength of the adhesive or sealant.

Additionally, various tests have been run with Bostik’s SMP technology inside powder coated production lines. The temperature needed to bake the powder coating can go up to 425°F. If the Bostik SMP technology has been completely cured prior to being subjected to the powder coat process, the adhesive, as well as the adhesion to the employed substrates, will not be attacked by these high temperatures. The other advantage of Bostik’s SMP technology is that the formulation will not attack the chemical treatment needs for the powder coating processes. More specifically, the chemicals inside the dipping baths will not be contaminated. The adhesive will not be attacked and the technical properties of the SMP technology will not change in the chemical dipping baths as well.
As mentioned earlier some parts of the world have to deal with extreme high temperatures and other parts have to face low temperatures and extreme cold for certain periods of the year. Some parts of the world that come in contact with extremely cold weather conditions include the USA, Canada, Siberia, Russia, Northern parts of Scandinavia, and others. Temperatures in those areas can easily drop to -40°F to -60°F. Additionally, the temperature of the substrates on the vehicle can get even lower. In this climate, the manufacturers have strict demands. The strength of a construction is often calculated with the elastic adhesives included. This means the adhesive will be a part of the stiffness of the construction and the manufacturer has to rely on the technical properties of the adhesives. The technical performance at very low temperatures is best characterized by its measured glass transition temperature, or Tg. We call this the Tg value of an adhesive. The Tg value of Bostik’s SMP technology will be around -55°C. Tg is the value when the elastic properties of the adhesive will change into a glass-like composition and the adhesive becomes brittle. Before it will reach the Tg value, the shore A hardness will slowly rise and this can influence the performance of an elastic adhesive. For example, if the temperature will drop below the Tg value of -55°C, the movement in an elastic bond will become very low. However, the vehicle will still naturally have some movement, and since the vehicle components can move, but the adhesive cannot due to its limited elasticity at low temperatures, a laminated window of a vehicle can break. If a manufacturer is producing vehicles for these kinds of cold regions, a calculation needs to be added to the design. The thickness of the bonding line needs to be calculated with higher temperature differences. If the vehicles will be sold to extremely hot or cold places, the differences between these temperatures needs to be added to the calculation of the construction as well.

**FOR EXAMPLE:**

Production at 70°F
Market demands: 120°F and -40°F. The differences will be:
- Increase of temperatures after bonding will be 50°F
- Decrease of temperature after bonding will be -110°F

Due to extensive experience and education, Bostik is an expert in the field of making these kinds of calculations and is able to advise manufacturers in the various transportation markets. All advice comes from independent research carried out by well-known, independent organizations.

The next graph shows the difference between Bostik’s SMP technology in comparison to a general PU adhesive. It shows the SMP technology compared to PU technology has better control of its elastic properties at high and low temperatures. This will make it easier for engineers to calculate the elastic properties of an adhesive even under extreme conditions. Bostik will be available for all market segments to help with these needed calculations.
Bostik’s SMP technology has been tested at several locations and by independent institutes. In general, the test results have shown that SMP technology has a much higher UV resistance in comparison to PU technology. This gives vehicle manufacturers the opportunity to create a seal without any protection against UV influences from the outside.

Sealing of windows and body construction can be carried out without any trim or other protection against UV. Bostik has also found that there is no color degradation due to the mentioned UV influences.

Bostik’s SMP is an adhesive technology which has excellent UV resistance over a very long period of time. All manufacturers, supplying regions where extreme UV influences are seen, are advised to use SMP technology.

FEATURES:
• In general, no degradation under UV light
• Mechanical properties not significantly influenced by UV light
• After two years outdoor exposure in Florida, no changes in strength have been seen (an automotive OEM requirement)
• Tested in QUV equipment for up to 12 months; equivalent to 15 years outside exposure

The SMP chemistry has flexibility that allows the formulator to tailor the product to make it suitable to sealing, all-purpose bonding, or high “grab” bonding. SMP products can also be painted over after the bead has formed a skin layer, as compared to polyurethane sealants that need to have fully cured prior to painting. Additionally, substrates typically need little to no surface preparation (like using primers or scuffing the surface) to acquire optimum adhesion with SMP sealants. Other benefits include solvent, isocyanate and PVC-free, no smell, little to no shrinkage, high electrical resistivity (in applications where the sealant will be near or bonded to electrical components), and long storage stability in the container.