

Focus on results:

Mechanical properties: For all four materials, standard industry methods were used to determine hardness, specific gravity, elongation at break, tensile strength, and tear strength. Results for all materials were within a range acceptable for thin layers supported on rigid substrates. The two TPSiV® examples exhibited higher values for each property than either the TPV or the TPU alloy. Significantly, the 4200-60A TPSiV® showed tensile strength approximately twice that of either the TPV or the TPU alloy.

Abrasion resistance: Durability was measured by a Taber abrasion protocol. The results are shown in [Figure 1](#). The TPV lost nearly twice as much material and the TPU/SEBS compound more than three times as much as either TPSiV® elastomer.

Compression set: At room temperature, measured compression set for the 4000-60A TPSiV® was comparable to that of the TPV and the TPU alloy, while the 4200-70A formulation exhibited significantly better performance. At 70 °C, however, TPSiV® materials outperformed both comparative examples due to performance of silicone rubber component.

Bond strength: A modified peel test was conducted to determine bond strength to a polycarbonate substrate. The results are shown in [Figure 2](#). Notably, the strength of both TPSiV® samples was more than twice that of the TPU alloy under either condition.

Weatherability: UV resistance was measured by exposure of sample plaques to 340 nm wavelength light at an intensity of 0.5 Watt/m² for 500 hours. The resulting color shifts are shown in [Figure 3](#).

Heat resistance: All four materials were subjected to a temperature of 120 °C for a period of 1000 hours and then tested for retention of mechanical properties. Both TPSiV® elastomers showed changes of less than 25% for tensile strength, tear strength, and elongation. The TPU exhibited greater property losses overall, but the sample was severely degraded by shrinkage, warpage, and color change. The TPV sample disintegrated to the point that changes in several properties could not be determined.

“Multibase is committed to exactly meeting our customers’ needs on various thermoplastic elastomers by leveraging our 30 plus years compounding expertise’s”, says Hammer Li, Global Marketing Manager, “global operations, unique silicone technology and, more important, our strong willingness to help our customers to be more successful in extremely competitive electronics market, now and future!”

New material developments:

Based on our market analysis, we are actively developing new materials for the TPSiV® product portfolio, anticipating demands by designers in the electronics market for additional ways to distinguish our products from the competition. Two significant advances have reached the stage where samples can be provided:

- Anti-bacterial elastomers,
- Improved compression set, for use in seals that could make devices water-resistant or dustproof.

Other technologies are in various stages of evaluation for feasibility, including:

- Black materials that could be laser-etched to create decoration or information,
- Elastomers that can be bonded to nylon substrates, which can produce thinner, lighter sections, affecting overall device size and weight,
- TPSiV® elastomers incorporating bio-sourced thermoplastics.



Notes and contacts:

The information in this report was presented at the 6th Specialty Elastomers and TPE Conference in Shanghai, China. A PDF copy of the original presentation, including the complete data sets, can be downloaded from the Multibase web site at this address: www.multibase.com/home/stay-tuned/news.html

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About Multibase

With its unique portfolio of thermoplastics and silicone solutions, Multibase offers an exceptional potential for value creation in the thermoplastic industry.

Multibase, a Dow Corning Company (www.multibase.com), provides compounded solutions that enrich, reinforce, and modify technical polymers in association with additives, mineral fillers, and silicones in order to extend their potential field of applications and their markets.

With four manufacturing sites located in the Americas, Europe, and Asia (India and now China), and with more than ten years of proven experience and external recognition through relevant ISO / TS accreditation, Multibase can provide coordinated global coverage enhanced by local teams.

About Dow Corning

Dow Corning (www.dowcorning.com) provides performance-enhancing solutions to serve the diverse needs of more than 25,000 customers worldwide. A global leader in silicones, silicon-based technology and innovation, Dow Corning offers more than 7,000 products and services via the company's *Dow Corning*[®] and *XIAMETER*[®] brands. Dow Corning is equally owned by The Dow Chemical Company and Corning, Incorporated. More than half of Dow Corning's annual sales are outside the United States.

Additional information

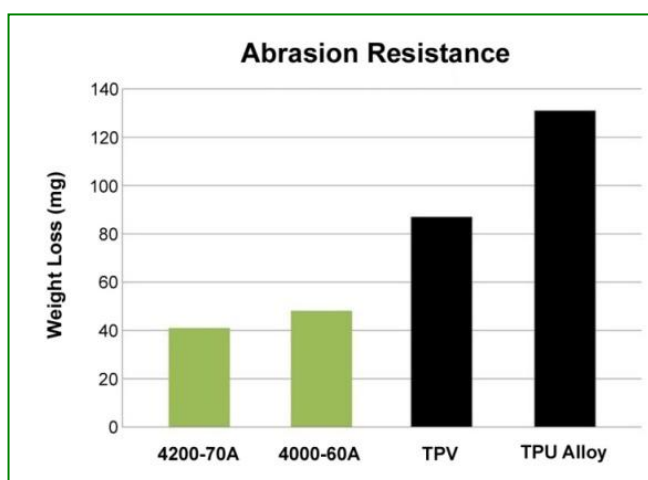


Figure 1: Material removed by Taber abrasion (ASTM D1440: H-18 wheel, 1000 g weight, and 1000 cycles).

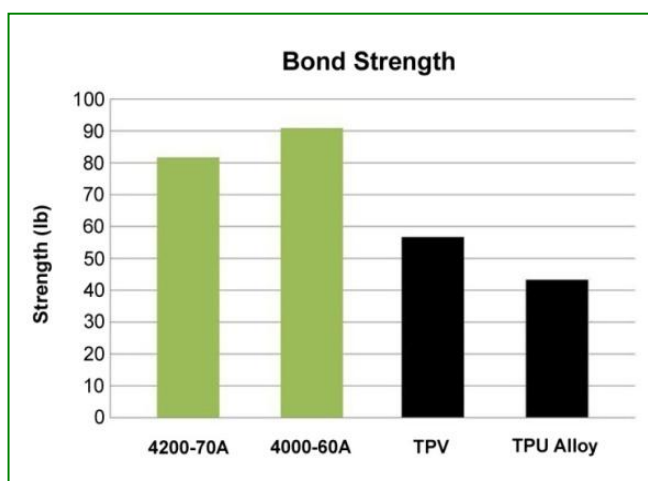


Figure 2: Bond strength was measured 'as molded' and after aging for seven days at 80 °C for peak strength. The 'as molded' results are shown here. Comparable gains were exhibited by each material after aging for seven days at 80 °C for peak bond strength.

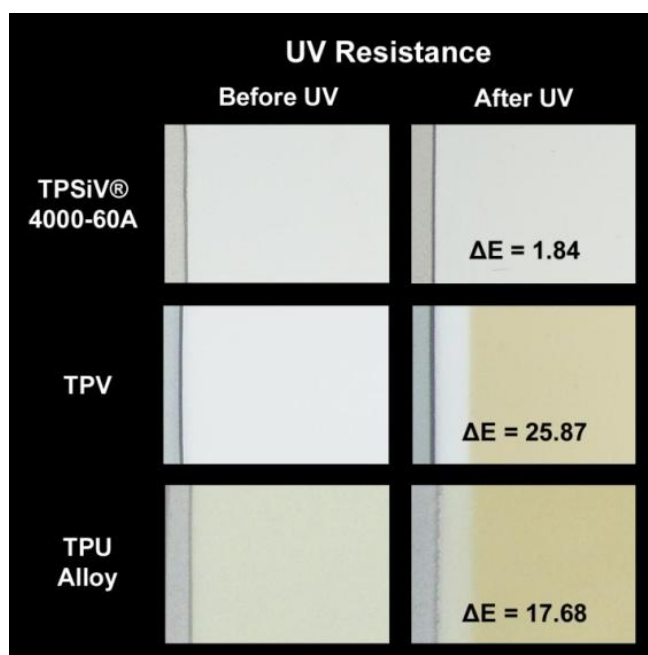


Figure 3: Color stability was measured by exposure to light with a wavelength of 340 nm, at an intensity of 5 W/m², for 500 hours. These photos show color shifts between exposed and unexposed plaques. Not shown is the shift for the 4200-70A TPSiV, which recorded a ΔE of 2.29.