

Acrylic Foam Tapes Help Seal the Deal for Weight Savings

Automakers have a strong desire to reduce vehicle weight while, at the same time, retaining or improving the performance of the vehicle components where weight has been removed. One area of focus for weight reduction in vehicles is the primary sealing system used around door and trunk openings.



The most common design for body-mounted seals in these two areas takes advantage of the flange around the body opening. A rubber seal cross-section is extruded around a wire or metal carrier, which is then crimped onto the flange to attach the seal to the body. When accounting for many seals on the vehicle, the weight of the metal carrier becomes significant to total vehicle weight.

To address this, 3M took on the challenge of finding a new way of attaching the seal to the flange using a method that would eliminate the heavy wire in the extrusion.

With its expertise in manufacturing tapes for many decades, 3M worked with tier suppliers to redesign the seal cross-section and attachment method in the focus vehicle areas to move from the crimped metal carrier to a high performance automotive acrylic foam tape.

The high performance automotive tape can be used for bonding weatherstrip seals, gaskets and other elastomeric materials. The system offers significant improvements and simplicity over traditional attachment methods such as pins, wire carriers, channels and liquid adhesives.

The tape system 3M created eliminates weight from a car in three ways. It:

- Removes metal from the extrusion;
- Allows for the reduction of flange size around the body opening; and
- Enables the use of lower gauge steel or aluminum body panels.

When 3M automotive attachment tapes are used, there is a weight reduction of up to 5kg per vehicle for the seals on four doors. In addition to weight saving benefits, a tape seal application results in improved retention of the seal to the car body compared to conventional metal carrier systems, thus reducing warranty costs. The use of tape also allows for improved bulb orientation, leading to a quieter cabin.

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