DOWSIL™ EA-5151 Adhesive
Delivers Enhanced Productivity, Lower Costs and Greater Reworkability in Three Automotive Electronics Applications
A Tier 1 Automotive Supplier

The Challenge
Buyers want vehicles that are safe, affordable and comfortable. Features like backup cameras, adaptive cruise control, blind-spot detection and forward collision warnings all help drivers to avoid crashes. As a result, buyers frequently consider a vehicle’s electronic displays and safety sensors when making purchasing decisions.

So when a Tier 1 automotive supplier prepared to develop three different challenging electronics applications, they sought The Dow Chemical Company’s help to find a versatile solution that would allow them to design and assemble their products quickly, cost-effectively and in compliance with high quality standards.

The applications included a ruggedized removable display for heavy construction equipment vehicles, a high-volume seat-belt reminder (SBR) sensor for a sport utility vehicle (SUV) and an autonomous driver assistance system (ADAS). Although very different from each other, all three applications needed a reliable adhesive and sealant that would maintain or even improve the rate and cost of assembly.

The Tier 1 supplier specified DOWSIL™ EA-5151 Silicone Adhesive during one of the innovation sessions that Dow’s Performance Silicones team regularly conducts with its key collaborators and customers. Dow’s customer was particularly interested in the material’s potential to replace pre-cut, double-sided tape, where it could help to reduce waste and speed assembly operations. The material also offered a lower energy cure than thermal cure adhesives and, in some cases, than many room-temperature vulcanizates (RTVs).

DOWSIL™ EA-5151 Adhesive also offers excellent reworkability, allowing it to be removed easily and reapplied within the first 24 hours or longer.

The Benefits
Through extensive testing, Dow’s customer validated DOWSIL™ EA-5151 Adhesive in three applications.

A ruggedized touchscreen display for heavy construction equipment vehicles: Available with either an 8- or 10-in. screen, this display can be removed from inside the vehicle, which means there is a risk the device may be dropped or its electronics exposed to dirt or water. The Tier supplier selected Dow’s adhesive to replace double-sided tape in this application to adhere and seal the display’s cover glass to its component housing. Testing revealed that DOWSIL™ EA-5151 Adhesive enabled the display to pass a rugged drop test and resist environmental contaminants.

The Solution
For all three display applications, DOWSIL™ EA-5151 Adhesive offered an ideal alternative to other bonding solutions. Dow’s one-part moisture-cure silicone adhesive is dispensed with a gun or dispense equipment when warmed, and cures at room temperature to seal components against moisture and contaminants. More importantly, it delivers green strength quickly to accelerate handling, speed assembly and increase production throughput. Once cured, DOWSIL™ EA-5151 Adhesive provides strong, flexible, primerless adhesion to a wide range of plastic and metal substrates.

CASE STUDY
Additionally, the customer discovered that DOWSIL™ EA-5151 Adhesive resulted in an eight-fold reduction in processing costs vs. tape. The instant green strength of Dow’s material not only accelerated throughput, it eliminated the material waste associated with tape. Assemblers at the customer’s plant also liked the re-workability that DOWSIL™ EA-5151 Adhesive provided. With tape, they had two minutes to adjust the touchscreen glass compared to up to 15 minutes provided by DOWSIL™ EA-5151 Adhesive.

A seat belt reminder (SBR) sensor for a sport utility vehicle: The second application of Dow’s material involved high-volume production of small SBR sensors that are installed five to a vehicle. Here, DOWSIL™ EA-5151 Adhesive replaced a thermally cured solution, where its fast green strength supported faster assembly and its room-temperature cured adhesive solution eliminated the energy cost and footprint of curing ovens.

By reducing the number of ovens, this tier supplier found they had freed up enough floor space to implement two additional production lines. But the benefits of DOWSIL™ EA-5151 Adhesive also extended beyond the assembly line, where it provided an excellent seal against water and rough outdoor use, which are common conditions for the SUV application these SBR sensors enable.

An advanced driver assistance sensor (ADAS): This Tier 1 supplier is recognized as an industry leader for its ADAS technology, which in the third application was designed to track driver eye movements. Again, the customer chose DOWSIL™ EA-5151 Adhesive to replace double-sided tape and mechanical fasteners in its design, where it serves as both a sealant around the camera lens and as an adhesive to bond the housing around the entire module.

How Can We Help You Today?
As you can see from these applications, Dow is enabling innovative design for customers serving the automotive electronics industry. Tell us about your performance, design and manufacturing challenges. Let us put our silicon-based materials expertise, application knowledge and processing experience to work for you.

Learn More
We bring more than just an industry-leading portfolio of advanced assembly materials. As your dedicated innovation leader, we bring proven process and application expertise, a reliable global supply base and world-class customer service. To find out how Dow can support your application needs, visit dow.com or email us at electronics@dow.com.