Technical Bulletin

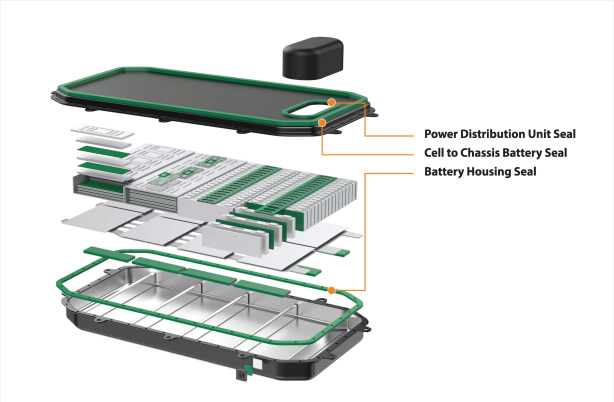
Battery Pack Sealing Solutions

BISCO® HT-800 Silicone

HT-800 material offers several benefits for battery pack sealing. It successfully passes demanding water immersion tests (surviving immersion in one meter of water for 24-48 hours), it exhibits low stress relaxation (ensuring long-term sealing), and it meets UL94-V0 flame retardant standards. With no leakage issues, BISCO HT-800 has a proven track record in various markets and allows easy disassembly for battery maintenance.

PORON® AquaPro® 37 & 41 Formulations

PORON AquaPro materials offer a strong resistance to stress relaxation and compression set (C-set), essential for durable, long-term sealing performance. These materials perform reliably across a broad temperature range from -40° to 90°C (-40° to 194°F) for constant use, and up to 120°C (248°F) for intermittent use. PORON AquaPro formulations also exhibit chemical resistance, surviving exposure to a wide range of common automotive fluids. Additionally, they meet flammability requirements of UL94 HBF and FMVSS 302.



The Challenge

To ensure proper environmental sealing of a battery pack or module under a car, the material solution must keep all contaminants out of the enclosure. The seal should ensure long-term reliability, focusing on stress relaxation (the tendency of a material to lose its force deflection over time under continuous compression), and compression set resistance. An additional benefit is providing flame resistance to battery chemicals in the case of thermal runaway.

Selecting the Correct Material

Understanding key application requirements is crucial to selecting the right material. Factors which guide product designers include temperature exposure, UV and ozone resistance, and chemical resistance as materials may contact chemicals or fluids that cause deterioration. Outgassing must also be considered to avoid harming battery components. If flame resistance is needed, materials must meet industry-recognized ratings like UL - V0, UL - HBF, or FMVSS - 302. Finally, the function of the gasket-whether it be sealing against liquids, solids or air, providing mitigation against shock or vibration or providing spring force-must be considered. Common requirements include IPX7/X8 or IP69K for sealing performance.

Ensuring Long-Term Performance

Stress relaxation and C-set are two key performance attributes to consider when evaluating long-term performance of the seal. All cellular elastomers exhibit stress relaxation, but it varies by material type. C-set measures an elastomer's ability to return to its original thickness after a compression load is released. Materials with good C-set resistance lose only a small percentage of their initial thickness after being compressed for a specified time and temperature.