

Battery Enclosures for Electric and Hybrid Vehicles

Constellium specializes in designing and producing battery enclosures that meet automakers' goals for performance and cost.

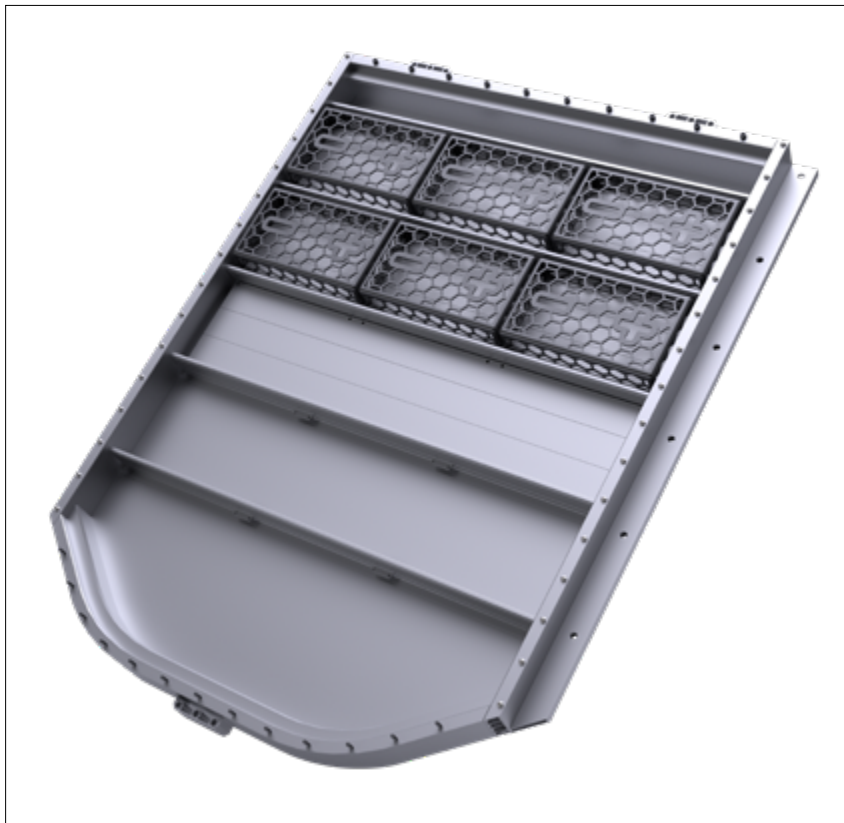
Advanced Aluminium Solutions

We supply complete battery enclosure assemblies for Plug-in Hybrid Electric Vehicles and Battery Electric Vehicles. These are designed, rapidly prototyped, and produced from superior aluminium alloys.

Our aluminum battery enclosures are engineered to resist crash and intrusion and to cool individual modules using innovative materials, design and joining technologies.

Providing Lightweight Protection

Battery enclosure assemblies safeguard the batteries in electric and hybrid vehicles from puncture or intrusion, thereby protecting passengers and others, as well as the environment, from potentially hazardous conditions. Structural battery enclosures must meet lightweight targets to achieve overall vehicle dynamics.



PRODUCT FEATURES

- ▶ **Superior materials** with optimized balance between elongation and strength for each function (side, plate, cross member) such as **high-strength Constellium HSA6™** and **crushable Constellium HCA6™**.
- ▶ Each extrusion is optimized in terms of **shape, gauge, and size**, and designed to **manage the load** and **minimize weight**.
- ▶ **Constellium's integrated cooling structures, CALD Solutions**, provide an innovative technology to optimize battery life through superior temperature homogeneity while acting as a structural and safety component.
- ▶ **Full structural integration** providing required stiffness at vehicle level.
- ▶ We also use **Constellium's 3xxx, 5xxx, and 6xxx alloy sheets** for the bottom and top of the enclosure.



Ideal for Top Plate, too

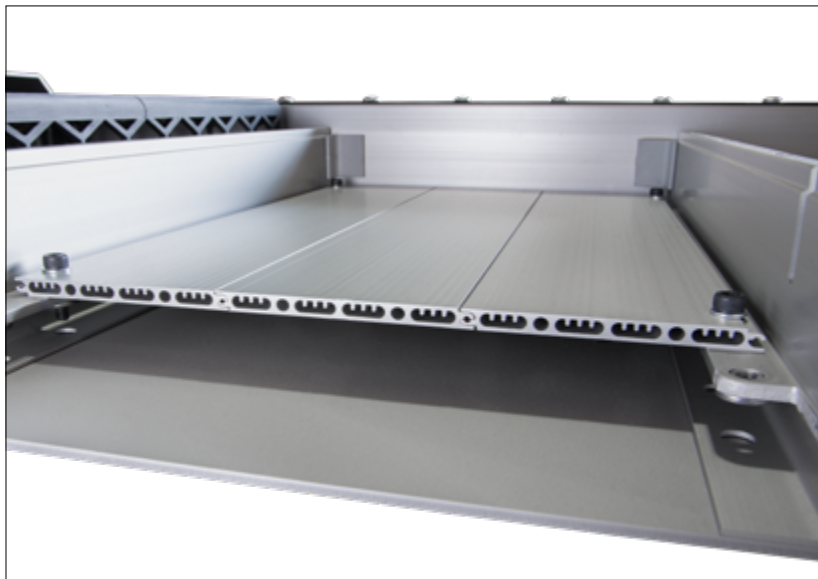
Aluminium is also a preferred material for the tops of enclosures, thanks to its corrosion resistance and formability into a variety of shapes. When the entire enclosure is made of aluminium, it creates a natural electromagnetic shield that blocks interference with other electric or electronic components in the vehicle.

Constellium's Unique Testing Methods

Our expertise in testing and manufacturing includes a new test for bottom intrusion, for which no standard exists. With new testing equipment and methods, we are developing the bottom plate to minimize intrusion and avoid cracks.

We have also developed a new test fixture and procedure to ensure that our enclosures are completely leakproof.

Those innovative testers allow significant time and cost saving for product development.



VARIOUS JOINING TECHNIQUES

For the best performance, we employ a variety of joining methods on battery enclosures, including:

- ▶ MIG Welding
- ▶ Friction Stir Welding
- ▶ Adhesive Bonding
- ▶ Flow Drill Screws
- ▶ Self-Piercing Rivets
- ▶ and others

www.constellium.com

