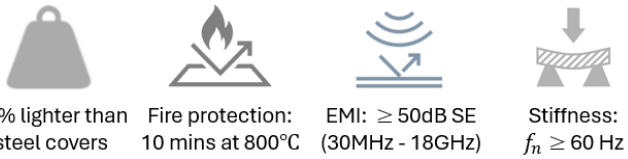
EV Battery Enclosure – Top cover

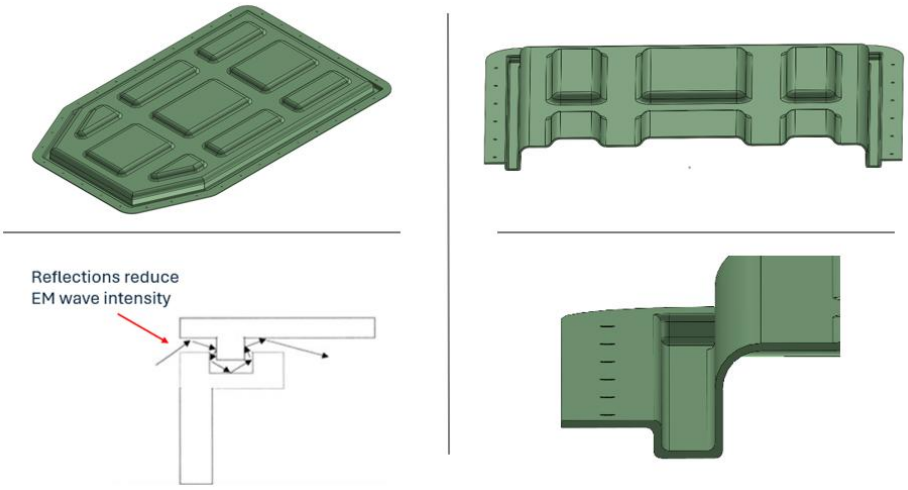
Objective: Design and prototype a mass-producible, recyclable composite battery top cover that is up to 50% lighter than steel alternatives. Beyond lightweighting, the CF/Thermoplastic composite is being functionalized to provide EMI shielding and thermal runaway protection.

Criteria



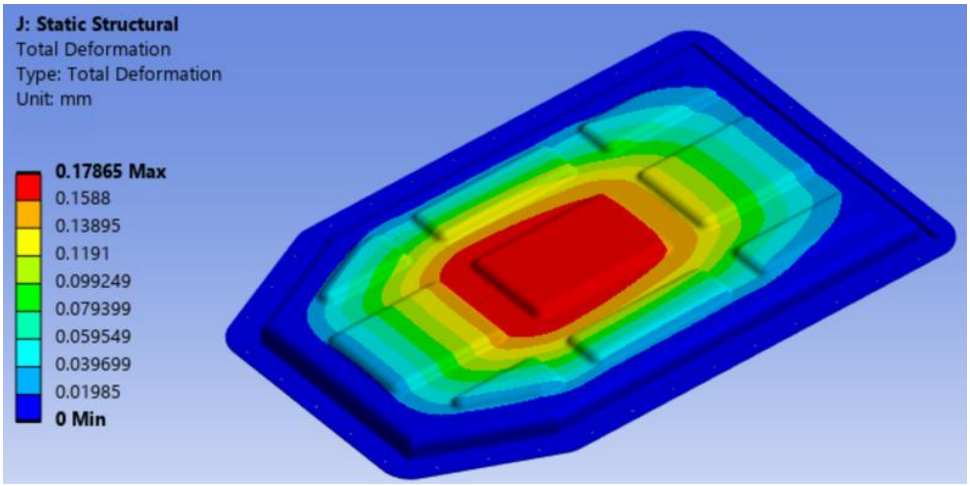
Conceptual Design

Optimized geometry to maximize stiffness, minimize weight and enhance EMI shielding. Further optimization for manufacturability on-going.



Simulation

Static structural simulation showing total deformation of the composite battery top cover under representative loading.



Material Functionalization

By integrating carbon fibers with carbon nanomaterials, the project leverages their synergistic effects to create multifunctional composites capable of ≥ 50 dB EMI SE and withstand 800 °C for 10 minutes.