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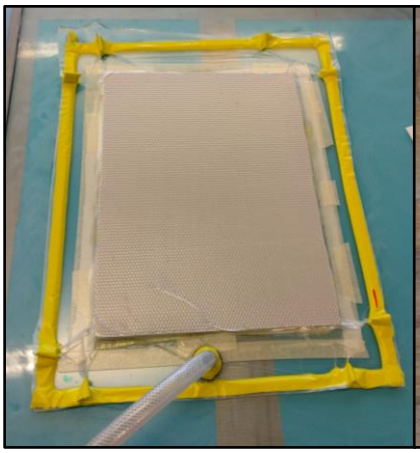
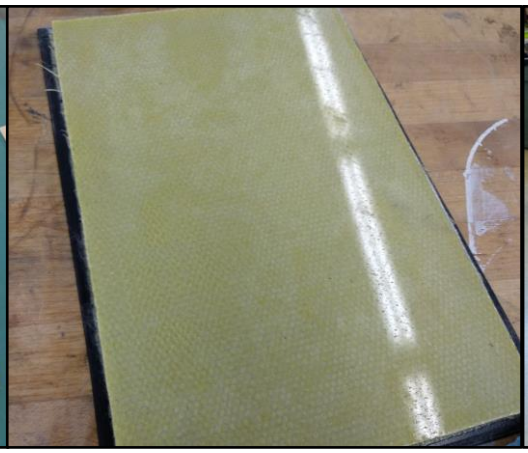
Design and Manufacturing of a Kevlar Firewall for WFE's FSAE Electric Vehicle

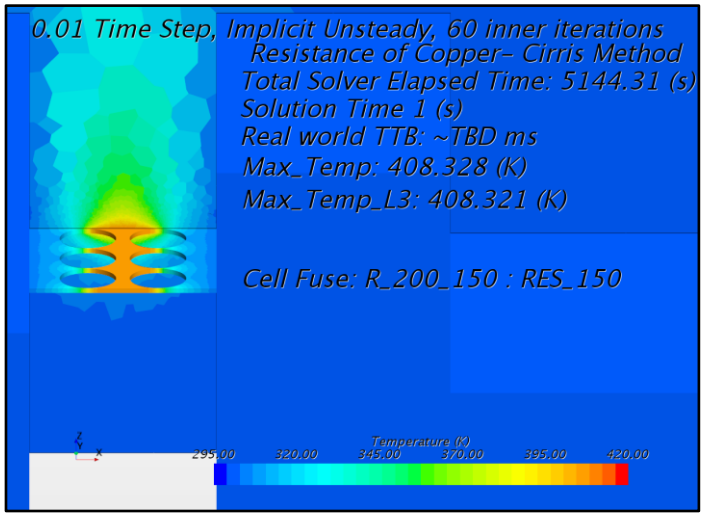




Kevlar and FR Resin Test Samples
Vacuum bagging the laminate ensured strong, stiff panels.

Finished Firewall
Kevlar, Nomex, Aluminum Sheet

Design of a Copper Cell Protection Fuse for Waterloo Formula Electric's Battery Pack

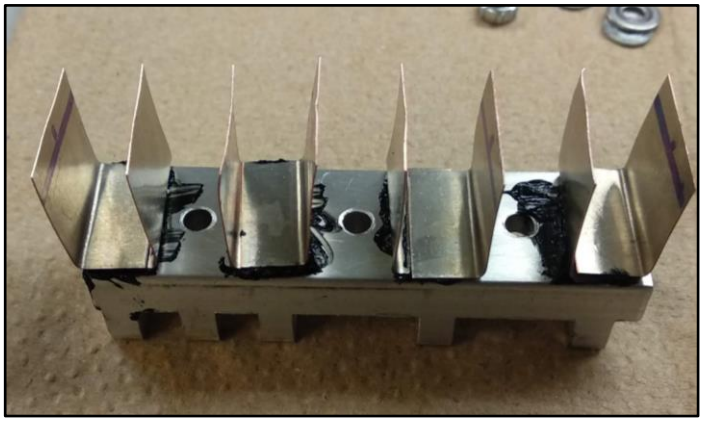


Fuse Design and Analysis

All 288 cells in the battery pack were to be protected by a fuse cut into the cell tab. Thermal and electrical design was completed in Star CCM+, then the fuse pattern was cut into material identical to the battery cell tabs.

The fusing time vs. current curve was shaped to fit between the cell thermal limit and pack fuse curve after extensive simulation and physical testing. Testing was completed on a custom high current test fixture up to 300 A.

Finished Cell Tab Produced by Custom Die
After the fuse design was complete, all 288 cell tabs were cut without scrapping any cells.



Cell Tab Contact Resistance Study
Cell-to-busbar resistance was measured at ≈ 300 μΩ after conductive grease application.