



**COMPONENT REDESIGN REDUCES ASSEMBLY TIME
AND MANUFACTURING COSTS BY REPLACING METAL**

**OPTIMIZED TO MEET THE MOST
DEMANDING EV REQUIREMENTS**

REPLACING METAL WITH COMPOSITES

- Mar-Bal collaborated with GE/Haier Appliances on redesign of a high-volume product – a control box enclosure for a dishwasher circuit board.
- The existing part was produced in-house through a metal stamping process which also included labor to assemble multiple components. Using a thermoset UL-5V material eliminated the need for assembly of an electrical shielding paper as part of the process.
- The metal stamping process created sharp edges that were a danger to workers during assembly and caused occasional damage to internal wiring resulting in operational failures and the need for repair.
- Our objective was to replace metal with thermoset for part consolidation, reduction of weight, assembly time, labor costs and removal of sharp edges.



METAL TO COMPOSITE COMPONENT REDESIGN REDUCES ASSEMBLY TIME AND MANUFACTURING COSTS, INCREASING SAFETY & QUALITY

Problem:

- Original metal stamped component required multiple part stamping and assembly, resulting in increased labor time and costs.
- Process also created sharp edges that were a safety concern for workers and would cut internal wiring necessary for appliance's functionality.

How Solved:

- Redesign of housing for circuit board control box with a composite solution provided a one-piece design that met electrical insulation requirements without the need for the dielectric shielding previously required with metal stamped housing.
- Molded in "standoffs" lifted circuit board off housing bottom preventing circuit board damage.
- Rounded edges and corners eliminated concerns for safety of assembly line operators and shearing of internal wiring.

Benefit:

- Consolidation of multiple components into a one-piece molded design meeting insulation requirements and reducing assembly time and labor costs on the production line. Elimination of sharp edges on the housing allowing for safe assembly and potential wire damage.

