

Daimler, a renowned automotive giant, partnered with Lear eSystem as its Tier 1 supplier for the development of the revolutionary OneBox—a pioneering electronic system designed to meet the demanding standards of modern automotive engineering. As the automotive industry embraced electrification, Daimler recognized the critical importance of optimizing key subsystems for the next decade. Among these, the Battery Box emerged as a pivotal component, demanding structural integrity, crash safety, cooling efficiency, tightness, and stringent OEM specifications.

AT A GALCE

SPECIFICATIONS:

- **Weight & cost:** New OneBox design must cut weight and cost by 40% vs. aluminum casting version to meet Daimler specs.
- **Crash Tests:** Expertise in crash test specs and energy absorption ensured resilience, validated by industry test centers.
- **Temperature Control:** Vital for PCBs; advanced thermal calculations and fluid management-maintained battery life, with sealing expertise ensuring tightness post-maintenance.

BENEFITS

Cuartari revolutionized electronic box design by challenging conventional casting norms with a creative approach.

- **Innovation:** Cuartari integrates diverse materials and technologies for cutting-edge solutions.
- **Versatility:** Multi-material and multi-technology design fosters adaptability to varied project needs. Our approach brought the best of casting, stamping and friction steer welding state of the art technologies.
- **Optimization:** Design thinking approach ensures efficient utilization of resources for superior outcomes.



"The innovative approach Ricardo and Pedro introduced to this game-changing system not only saved our account but also ensured our competitive edge in the market". **Lear eSystem**

CHALLENGES

In the automotive industry of the 2020s, the Battery Box emerged as a crucial subsystem for electrified vehicles, demanding expertise in crash safety, fire risk, and cooling efficiency. Mastery of diverse materials and intricate manufacturing techniques was essential, alongside structural calculations and rigorous testing to meet OEM standards.

SOLUTIONS

- **Comprehensive Solution:** Cuartari applied Design for Six Sigma (DFSS), utilizing casting for the small cooling system and stamped high-performance High-Strength Steel (HSS) metal to meet specifications with mixed technologies and materials as needed.
- **Material Mastery:** Expertise in diverse materials like aluminum, high-strength steel, plastics, and composites ensures optimal performance.
- **Advanced Manufacturing:** Cuartari employs intricate techniques including multi-material stamping, foundry work, welding, and sealing for construction.
- **Structural Integrity:** Utilizing FEM for static and dynamic scenarios, Cuartari ensures the Battery Box meets stringent OEM platform development plans.
- **Rigorous Testing:** Cuartari conducts thorough prototyping and testing to guarantee compliance with industry standards and client requirements.

Cuartari's innovative approach not only met all OEM specifications but also revolutionized the global industry's design approach to electronic boxes, becoming a new automotive market standard. This success has garnered Cuartari new requests for DFSS design of all types of casting boxes, cementing its reputation as a leader in automotive design solutions.

RESULTS

- **Weight and Cost Reduction:** Cuartari successfully reduced the weight and cost of the Battery Box by 40% and 35%, respectively.
- **Exceeded Crash Test Expectations:** Cuartari's design surpassed client expectations in crash test results, ensuring superior safety standards.
- **Enhanced Temperature Dissipation:** Cuartari's innovative approach improved temperature dissipation, exceeding client requirements for optimal battery performance.