



SUCCESS GUIDE

Mobility

[Formerra.com](https://formerra.com)

Progress means keeping things moving, and to keep things moving, you need an experienced partner who understands the dynamic nature of the modern mobility sector. From assisting with material selection, redesign, light-weighting and performance improvement, to streamlining supply chain, meeting sustainability goals, and mitigating compliance risks to improve working capital and inventory management, Formerra specializes in on-time delivery with complete transparency at every step of the development cycle.

Discover how Formerra drives success for its clients through advanced material science, deep industry expertise, and a vast network spanning North America, Europe, and Asia.



Powering Progress: A Strategic Shift in EV Design Transforming Performance: Success in EV

THE CHALLENGE

The client, a leading electric vehicle (EV) manufacturer, initiated a metal-to-plastic conversion of various vehicle components with the goal of decreasing the weight and production cost of their midsize luxury SUV without compromising performance. Any solutions had to be implemented under a tight deadline to realize immediate cost savings and avoid any production line downtime.

THE SOLUTIONS

The final metal-to-plastic conversion utilized PC/ABS solutions including color-matched and precolored PC/ABS. Formerra performed six mold flow analyses, 30+ support phone conferences with the client engineering team, and 29 full-day onsite tech service visits at production locations in both China and the US. Formerra also coordinated with one of their material suppliers to provide two days of onsite support to leverage deep technical knowledge. Formerra's support and solutions provided approximately \$80,000 in value to the customer.



Leading EV
manufacturer
realizes \$1M+
annual savings by
switching vehicle
components from
metal to plastic



Powering Progress: A Strategic Shift in EV Design Transforming Performance: Success in EV

(continued)

THE RESULTS

This conversion project saved the client \$1 M+ annually on production of this particular vehicle, and the timely work of Formerra's Technical Support team allowed the client to implement the solution quickly without production down time. The client also realized process and cost improvements by consolidating PC/ABS solutions with Formerra's guidance, providing an estimated additional annual benefit of \$320K+.

THE KEY TAKEAWAYS

Weight is a consideration at every stage of electric vehicle development. In particular, it is a critical factor in vehicle range and safety. Therefore, where there is an opportunity to convert metal components to plastic, designers will explore it. The level of commitment by the Formerra Technical Support team went above and beyond as the scope of the project expanded beyond the tier supplier level to include the OEM design team. The client appreciated being able to leverage Formerra's deep industry expertise as a secondary on-site resource and further utilized that knowledge to inform their designs and process development.

From Defect to Solution: A Strategic Approach

THE CHALLENGE

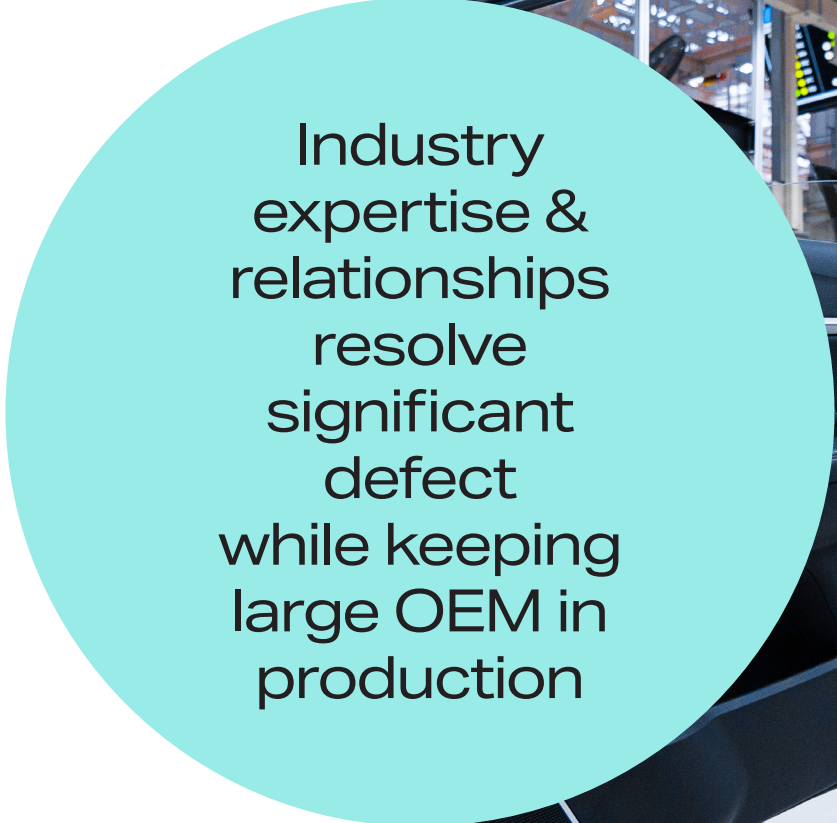
The client, an industrial mold manufacturer who supplies a major OEM, was seeing silver streaking (splay) occurring in a widely used PC/ABS. The issue did not appear to be drying- or material-related, and the splay was making a defect that was showing through the secondary paint process.

THE SOLUTIONS

Formerra's Key Account Management team and Technical Support team worked on a solution that included a slide gate modification and a material change to Covestro T95MF-901510, which has a higher Deflection Temperature Under Load (DTUL) and higher Heat Deflection Temperature (HDT).

DTUL or HDT is the temperature at which a polymer or plastic sample deforms under a specific load. An injection molded plastic part is considered "safe" to remove from its mold once it is near or below the HOT, meaning part deformation will be held within acceptable limits after removal. Choosing a resin with a higher HOT can allow manufacturers to achieve a much faster molding process than they would otherwise while maintaining dimensional changes within certain limits.

This combination of changes resolved the splay issue, provided a cosmetically appropriate part, and helped with material consolidation as T95M F was already being used in other OEM applications.



Industry
expertise &
relationships
resolve
significant
defect
while keeping
large OEM in
production



From Defect to Solution: A Strategic Approach

(continued)

THE RESULTS

Revising the gate design and using the material with a higher HOT reduced scrap by resolving the spray produced during the client's oven cure process. The issue took less than four months to fully resolve and, since Formerra utilized a material that was already part of the client's supply chain, the solution resulted in a lower price per pound of T95M F thanks to Formerra's strategic pricing arrangement with the OEM.

THE KEY TAKEAWAYS

Formerra works across the value chain to include OEMs, Tier 1's, and resin manufacturers (suppliers). In this case, Formerra's Account Manager was able to involve a cross-functional team of key personnel from the OEM, Formerra and Covestro. Formerra was able to use their knowledge, expertise and relationships to quickly resolve the issue and keep the client in production.

Navigating Change: A Success Towards Safety and Cost-Efficient

THE CHALLENGE

An industrial molder was looking for an alternative to an incumbent material, citing cost and inconsistency as an issue. The client required a material with flame retardancy properties and specific safety coloration to be used in two programs.

THE SOLUTIONS

Formerra worked closely with one of its suppliers for about a year to develop a formulation that would produce a material that meets the regulatory requirements without sacrificing performance at a lower cost than the incumbent material.

Molder
supplying two
major auto
manufacturers
develops
cost-saving
customized
material
formulation



Navigating Change: A Success Towards Safety and Cost-Efficient

(continued)

THE RESULTS

Formerra was able to offer substantial cost-savings per pound on the resin over the incumbent material while also adhering to the safety specs of the project. The total annual savings is estimated to be in the range of \$500K-\$1.0M per year for both programs.

THE KEY TAKEAWAYS

It's a preconceived notion that specialty engineered materials are always more costly than commodity products. On the flip side, just because a material is the de facto "standard" or most readily available doesn't necessarily mean that it's the most affordable option. With the high production costs associated with EVs, OEMs are looking for cost savings wherever possible. Formerra's team evaluates every option to find the right solution for each client.

From Challenges to Victory: A Breakthrough in EV

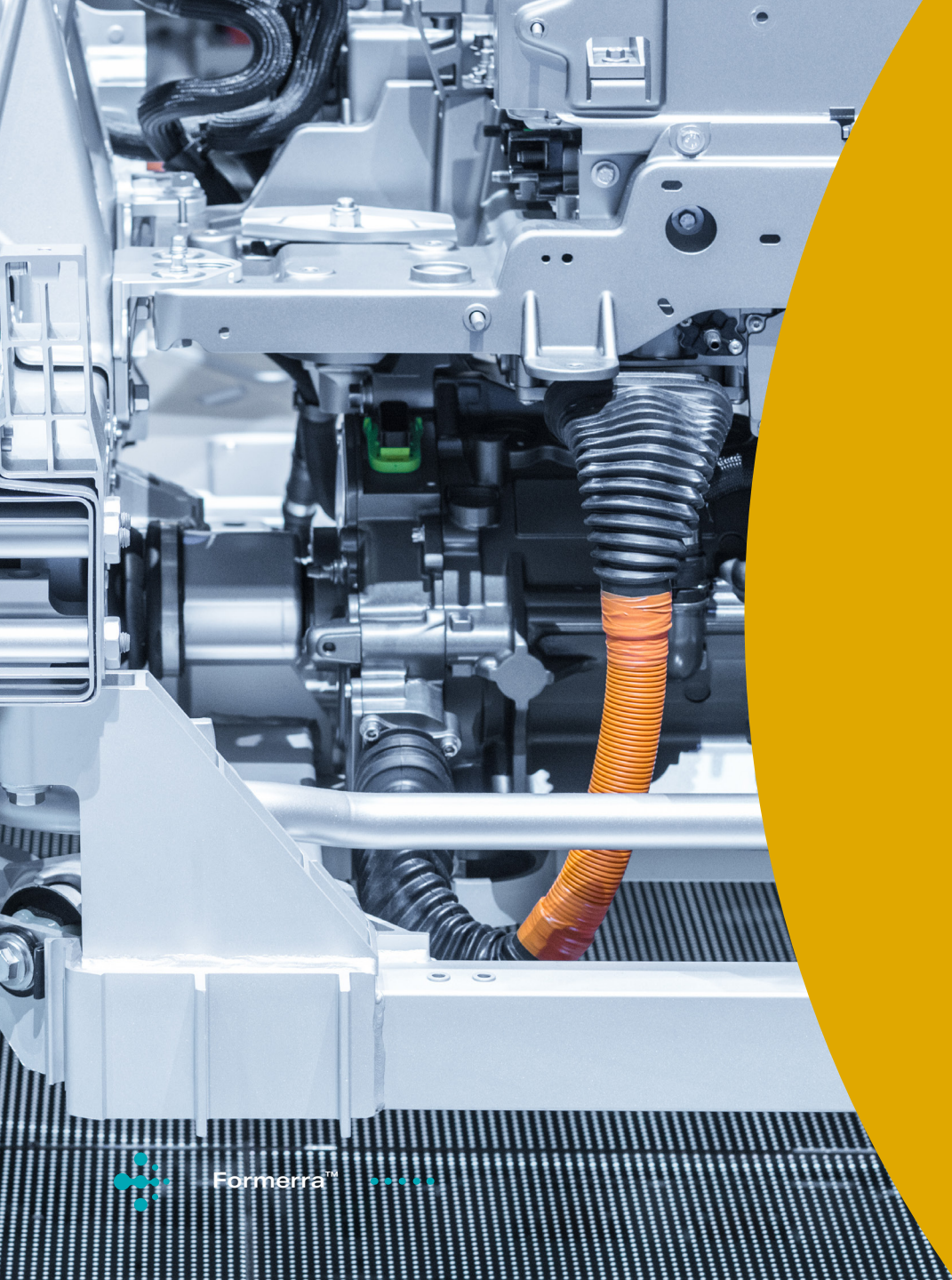
THE CHALLENGE

The client approached Formerra to develop a plastics-based coolant tubing that would reduce weight, add to vehicle efficiency and range, and provide the ability to optimize architecture and design for its OEM customers. Adding to the technical challenge, the global impact of the pandemic created major logistical complications in the supply chain.

THE SOLUTIONS

Celanese Zytel LC7603 BK was chosen as the preferred solution for this project. Formerra held 11,000 pounds of the material in stock for eight months to service the client's trial processes and supply sampling quantities for validation. To that end, Formerra also worked with the Celanese team to get the material specified and qualified for commercialization, as well as helped negotiate longer-term supply, stocking, and assurance agreements.

Global Tier 1
automotive
supplier develops
specialty fluid
handling
component for
the EV market
during pandemic



From Challenges to Victory: A Breakthrough in EV

(continued)

THE RESULTS

Despite the unprecedented disruption of the pandemic, the client was able to introduce specialty tubing and connectors for EVs. In 2022, it was estimated the client was using 100,000 pounds of the material. The amount has increased to approximately 1.5 million pounds and is projected to be a little over 2 million pounds in 2025.

THE KEY TAKEAWAYS

Even through major supply and pricing disruptions, Formerra was able to collaborate with the client and two major suppliers to develop an innovative solution that allowed them to retain a substantial part of their business.

Enhancing Visibility: Transforming Headlight Performance

THE CHALLENGE

The client sought to formulate a resin-based backshell of a headlight for semi-trucks, whose beams are much more powerful and run much hotter than conventional vehicle LEDs. They wanted to develop a thermally responsive resin that could allow these components to be manufactured in-house and, in turn, better mitigate risk in the supply chain and control inventory levels.

THE SOLUTIONS

Formerra worked with a custom resin formulator to develop a specialty material for this client's application that replicated aluminum's thermal conductivity at around 200 watts per meter-kelvin (W/m·K). The client's engineering team then perfected the component's form factor, adjusting the design to reduce the surface area and weight.

Auto OEM finds
greater advantage
in plastic-molded
alternative



Enhancing Visibility: Transforming Headlight Performance

(continued)

THE RESULTS

The outcome was a nylon-magnesium-molded resin headlamp that can withstand a lifetime of on-the-road vibration that is slightly lighter weight, and slightly less costly than its full-metal predecessors.

THE KEY TAKEAWAYS

The client was able to draw upon Formerra's materials expertise as well as their supplier network to find the right solution. The team was looking to not only replace metal components with plastic but also develop a "new standard" for replacing aluminum components for the industry. Lighter and more cost-effective, injection-molded parts that can conduct heat or electricity, like the one developed here, may come to replace much more in the conventional vehicle assemblies of the near future.



Ride with Formerra as Your Co-Pilot

Formerra's team of material selection, engineering, manufacturing, compliance, and supply chain experts is well-positioned to help you clear the hurdles of the mobility industry and beyond.

See what sets us apart.

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