

Challenge Accepted.

SWITCHING FROM STEEL TO NYLON CREATES MULTIPLE BENEFITS



» CASE STUDY: BERGAMID™ NYLON FORMULATIONS



A COMPLEX SEAT FASTENER AT A LOWER COST, LOWER WEIGHT AND WITH GREATER DESIGN FLEXIBILITY

THE CHALLENGE

The automotive industry is increasingly turning to engineered thermoplastics to replace metal parts, thereby achieving benefits of lower weight for greater fuel efficiency, increased design freedom to incorporate larger numbers of sophisticated components, and lower costs from elimination of secondary fabrication steps.

HellermannTyton, a global leader in designing and manufacturing fastening solutions for the automotive industry, wanted to improve upon the bent steel plate it was using to fabricate a complicated seat fastening device for a leading automotive manufacturer. This rectangular piece, mounted under the driver and front passenger seats, functions as the attachment point for power seating positioning, heating and electronics. The part is very complex, with multiple openings, and an irregular shape.

“We saw an untapped market opportunity for improved seat fastening solutions and recognized that continuing to use bent steel plate would hold us back,” said Hagen Spiess, Senior Design Engineer at HellermannTyton. “First, sheet metal restricts design flexibility, and different automotive OEMs request different attachment configurations for the part, so it becomes extremely time-consuming to design and fabricate multiple variations in metal. Also, the price of bent steel plate is currently going up. Finally, OEM customers want lighter-weight components to help improve vehicle fuel efficiency.”

HellermannTyton designers believed that engineered thermoplastics were the answer. Because of the company’s long relationship with Avient, the supplier asked for a material recommendation to replace bent steel plate. Among the required properties were high strength and stiffness, impact resistance, moderate temperature resistance and low warpage.

THE SOLUTION

Avient recommended Bergamid™ B70 G30H black TM-X PA 6 resin with 30 percent glass fiber reinforcement for its excellent mechanical properties and cost benefits. This material offers the stiffness and high impact performance required to support and secure multiple electronic attachments, and provides the impact and temperature resistance needed.

HellermannTyton decided to develop the seat securement part using injection-molded Bergamid resin in a standard black color. Avient’s team provided a variety of value-added technical services, including assistance with tool development, process optimization and testing.

THE IMPACT

By replacing traditional fabricated bent steel plate with injection-molded Bergamid PA 6 resin, HellermannTyton was able to duplicate key performance attributes while gaining new benefits in the areas of cost savings, design freedom and weight reduction. A major German automaker has already made the switch to the new seat fastening part for a vehicle currently in production.

- **New material = competitive differentiator:** HellermannTyton is able to set its offering apart from the competition by adding significant value, particularly lighter weight and lower system costs.
- **Design flexibility = fast customization:** Plastic offers much greater design freedom than metal, enabling the company to quickly develop and produce variations of the seat securement part for different customers.
- **Lighter weight = environmental benefits:** By reducing the weight of the part by approximately 50%, Bergamid resin can help automakers achieve better fuel efficiency and lower CO₂ emissions.
- **Excellent performance = customer satisfaction:** The strength, impact resistance, low warpage and additional properties of Bergamid resin help ensure the part meets stringent OEM requirements and satisfies its customers.
- **Injection molding = system cost savings:** Compared to metal fabrication, which requires time-consuming secondary operations, injection molded plastics can be produced as a net-shape part in a single step, boosting productivity and lowering system costs. The materials also allow designers to integrate features into the part without the need for fasteners or secondary operations. Further, the material costs for Bergamid resin are lower than those of bent steel plate.

“Avient’s materials and technical support enabled us to re-create a complicated part in nylon resin, which not only solved cost, time and weight issues, but also provided a unique offering for our automotive OEM customers,” said Spiess. “The new seat securement part has already been adopted by one OEM customer, and we are confident that other manufacturers will come to us for this lightweight, cost-efficient solution.”

To learn more about Bergamid™ Nylon Formulations, contact Avient at +1.844.4AVIENT (1.844.428.4368) or visit us at avient.com.