

Challenge Accepted.

# METAL REPLACEMENT COMBINES METAL'S STRENGTH WITH PLASTIC'S LIGHT WEIGHT



 **AVIENT™**      » CASE STUDY: COMPLET™ LONG GLASS FIBER REINFORCED COMPOSITE





# LONG FIBER TECHNOLOGY PROVIDES POWERFUL SOLUTION FOR BETTCHER INDUSTRIES

## THE CHALLENGE

Bettcher Industries, Inc. is a leader in food processing equipment, and recognized for innovative, performance products. The Quantum™ Motor is one such product, a universal cutting tool in the meat processing industry that helps recover lean meat from fat and tissue.

A time-tested and successful product, the Quantum Motor had historically used cast aluminum for its yoke. This was great for strength and performance, but the yoke was heavy, had long lead times for production, and was nearly \$100 per part, making it ripe for a metal-to-plastic conversion.

When Avient proposed re-engineering the yoke with an alternative composite material, Bettcher was receptive, but needed evidence that a polymer solution would retain the reliable performance its customers demanded. To validate the switch, Avient's solution needed to provide excellent chemical resistance to corrosive substances during use, withstand frequent sanitation procedures for long-term durability, and lower overall costs for Bettcher.

## THE SOLUTION

Avient proactively worked with Bettcher's product development team to fully understand the yoke specifications to help ensure end-product quality would remain unparalleled in the market.

Supporting a 25-pound motor that powers multiple trimmers and pneumatic tools, the yoke needed to stand up against rigorous use, including load and vibration of the motor, operator torque, and rotational movement functionality.

Spurred by the need for high strength and low weight, Avient quickly identified a Complèt™ long glass fiber nylon composite as a best-fit solution. With lightweighting benefits and design freedom, this high-end composite was shown in mold filling and FEA analysis to maintain the reliability and strength of metal. Avient's team also provided hands-on design recommendations to minimize knit line concerns and address structural requirements.

Using the new Complèt long glass fiber nylon formulation, the redesigned yoke underwent testing at Bettcher to simulate 500,000 run cycles. These tests confirmed that the long fiber reinforced solution would successfully handle constant weight loads and unforeseen impacts while performing reliably across a broad range of temperatures and application demands.

The final solution was pre-colored to match the brand's existing color palette and eliminate the need for secondary processing steps.

## THE IMPACT

At its core, the goal of re-engineering the motor yoke was to maintain quality, durability and strength while reducing weight and lowering costs.

"With any product update or change, there is risk," said Joel Hall, Senior Engineering Manager from Bettcher. "Avient's team helped mitigate that risk through education, advanced testing and technical expertise. While we are well aware of the industry and the application demands, Avient was able to provide the design support capabilities and materials expertise to help us optimize performance and streamline the development process."

Complèt long fiber composite not only met structural performance (strength), toughness and corrosion resistance requirements, it reduced part weight by nearly 40%.

An injection molded solution, Complèt offered Bettcher Industries faster, single-step production with repeatable quality that enabled them to drive down overall production costs.

"We are grateful for Avient's proactive approach," added Hall. "Soon after our combined efforts to re-engineer the product, we were faced with supply challenges with the cast aluminum. Because of the collaborative engineering with Avient, we were able to confidently transition to the long fiber technology and ultimately deliver a high-end, innovative product to our customers."