

Rifle Rail Skins Get a Cost-Effective Makeover

PolyOne helps LWRC International make the switch to a high-performance material that trims \$30,000 from the initial production budget.

Situation

In the past decade, high-performance plastics have become the standard for pistol frames. Prior to 2000, arms designers resisted the use of plastics in their products. Today, however, the use of plastics has expanded into rifle components such as grips, stocks, and magazines.

Arms manufacturer LWRC International, LLC had been using polyphthalamide (PPA) to mold rail skins for its M4 semi-automatic rifle. A molded plastic rail skin can be used to cover the weapon's Picatinny Rail, where locking devices allow the user to attach accessories. The rail skin serves to protect the rail from impact and to shield the user's hand from heat. As a result, the rail skin material must be heat resistant and tough at both ends of the temperature spectrum.

PPA has high heat-resistance, but its processing requires long cycle times and oil-cooled molds, which in turn have long set-up times and are costly to operate. When LWRC designers decided to modernize the M4 rifle, updating its look and feel and enhancing the operating system, they also looked for a new material that could withstand heat, cold and abuse, yet process more easily.

The PolyOne Difference

Based on an extensive knowledge of the application's requirements and LWRC's processing operations, PolyOne's technical team recommended a specially formulated Edgetek™ material in Black and Flat Dark Earth colors. This engineering thermoplastic formulation provided the necessary heat, impact, and abrasion resistance, and could be molded in traditional water-cooled tools, making it significantly easier to process than PPA. The PolyOne team attended mold trials and optimized the specific formulation for the existing tool. Using the Edgetek™ solution, LWRC was able to reduce scrap rate by 2 percent and decrease cycle times by 13 percent. Further, using the pre-colored compound eliminated the need for painting.

The specialty material's improved processability allowed LWRC designers to engineer a molded-in, polymeric locking device rather than fabricating, heat-treating, and plating a separate spring steel clip locking device. This new locking device not only saved significant costs, but enabled the rail skins to be used on any manufacturer's Picatinny rail, making it easier for the end user to customize their rifle.



Delivering a Value-Added Solution

Using PolyOne's Edgetek™ compound delivered significant value to the new M4 rifle. LWRC saved almost \$15,000 in material cost in the first year of startup production, and an additional \$3,000 because polyamide has a lower specific gravity and thus requires fewer pounds of material per part. Adding in the savings from improved cycle time, reduced scrap rate, and the elimination of painting operations brought the total savings for LWRC to nearly \$30,000 in that first year. Going forward with additional applications, LWRC estimates the savings will grow to at least \$300,000 annually.

Darren Mellors, LWRC executive vice president, said, "Our military troops and law enforcement officers put their lives on the line every day in extreme conditions and circumstances in service of our country and communities. We feel they entrust us to produce products that are tough enough to withstand any situation, so that they don't need to think twice about whether the product will perform as designed. Thanks to PolyOne, our products are just as tough as the men and women who carry them into harm's way."

PolyOne offers specialized solutions that are targeted at helping customers improve operational efficiency, meet environmental targets, and maximize value in every way possible.

Product choices often vary by region due to differences in regulatory and agency requirements, availability and other key factors. Please contact your nearest sales office for assistance in choosing the right solution for your locale.

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