



Case Study

Color & Additives
PolyOne Distribution
Specialty Engineered Materials

Metallic-Effect Compounds Improve the Eco-Friendly Nature of the Ford Escape Hybrid

Pre-colored Maxxam™ FX Metal polypropylene eliminates VOCs and painting for cost savings and a lower carbon footprint.

Situation

When designers at Ford Motor Co. went to the drawing board to design a next generation Escape Hybrid, the team looked for ways to add more eco-friendly features. They focused on the polypropylene engine cover, which had been coated with metallic paint to achieve a high-quality finish. Designers wanted to eliminate painting and its associated VOC emissions without losing the aesthetic appeal of a metallic look. The idea of molded-in-color material with a metallic effect emerged as a possible solution.

The chosen compound also had to meet specific performance requirements, including:

- Melt Flow Rate: 3 - 11g/10 minutes
- Talc Filler Content: 17 - 23%
- Tensile Strength at Yield, minimum: 29 MPa
- Flexural Modulus, minimum: 2.8 GPa
- Impact Strength, Izod, minimum: 1.7 kJ/m²
- Heat Deflection Temperature, min 56°C

Most importantly, the engine cover is a highly aesthetic part that contributes significantly to the Escape image and Ford's marketing efforts. As such, the molded-in-color version had to live up to exacting visual standards, without the highly visible knit lines common to other metallic-look plastic components.

The PolyOne Difference

When Ford's design team saw a sample of PolyOne's Maxxam™ FX Metal, a metallic-look, talc-filled polypropylene compound, they asked supplier MPC Inc. (Walworth, WI) to evaluate the material in the engine cover application.

PolyOne's technical service team had experience on a similar project, and was able to translate their knowledge to reduce the amount of time that MPC spent in validation.

To preclude the possibility of knit lines forming in the molded engine covers, the PolyOne team worked with the supplier in designing the injection mold for this part. By routing material flow in the mold so that flow fronts meet at the edges of the cover, the mold design helps to eliminate visible knit lines.



Delivering a Value-Added Solution

PolyOne provided a solution that met Ford's performance and aesthetic requirements while simultaneously eliminating VOCs and cost from the manufacturing process.

Eliminating Paint = Total Manufacturing Cost Savings

By replacing traditional plastics that required post-mold painting with molded-in color Maxxam FX Metal, MPC was able to reduce the cost of producing the engine covers by approximately \$800,000 annually. This figure represents the amount spent to have the parts painted by a nearby vendor, and includes the cost of transporting the parts back and forth to the paint shop.

In addition, because of PolyOne's considerable compounding expertise, its technical team was able to improve material cost performance without trading off performance or excellent aesthetics.

Compounding Expertise = Design Freedom

PolyOne's considerable knowledge in compounding brings the ability to provide a metallic effect material in a variety of base resins, and designers can select these compounds with confidence, knowing that they will meet performance objectives as well as aesthetic goals.

Compounds or Colorants = Processing Flexibility

Metallic effect materials can be supplied as pre-colored compounds or as natural resin. In this latter case, PolyOne supplies compatible OnColor™ FX color concentrates for on-site blending. This flexibility enables processors to work with the material in whichever way is most cost-effective for their operations.

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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