ExxonMobil
Signature Polymers

Case study

Exceed™ PP

Injection molding efficiency gains with Exceed™ PP8864E1

Short cycle time

Low peak injection pressure

Low barrel temperature

Data and results presented herein apply specifically to the noted application under this case study.
Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge

TENMA (HCM) VIETNAM CO., LTD., a leading manufacturer of precision plastic components, aimed to enhance production efficiency while adhering to stringent requirements for a critical motorcycle part. In today's manufacturing landscape, the automotive and motorcycle sectors are under pressure to deliver lightweight, durable, and cost-effective components without compromising quality or safety standards.

Lightweighting: OEMs are increasingly shifting toward high-performance plastics to help reduce weight and improve fuel efficiency.

Lower cycle time for higher productivity: To remain competitive, manufacturers are seeking to reduce injection molding cycle times, which can enable higher output per machine and lower per-part cost.

Solution

The team at ExxonMobil Signature Polymers introduced Exceed™ PP8864E1, a high-performance polypropylene impact copolymer, to TENMA (HCM) VIETNAM CO., LTD.

It is a medium flow, nucleated grade with balanced stiffness and toughness that is optimized for injection molding applications requiring excellent toughness and processability.

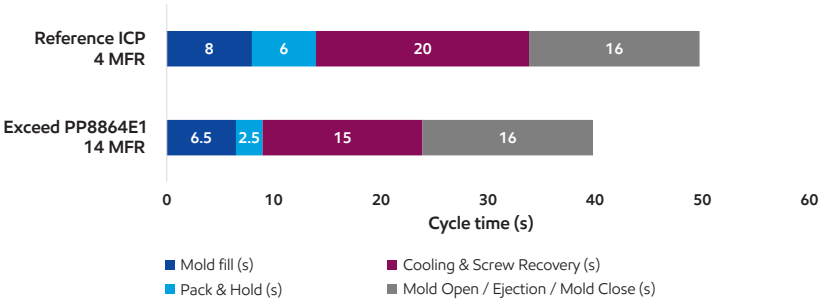
Property	Value	Test method
Melt Mass-Flow Rate (230°C/2.16 kg)	14 g/10 min	ASTM D1238
Density	0.900 g/cm^3	ExxonMobil Method
Tensile Stress at Yield	20.2 MPa	ISO 527-2
Flexural Modulus (2.0mm/min)	1110 MPa	ISO 178
Notched Izod Impact Strength (23°C)	51 kJ/m^2	ISO 180
Heat Deflection Temperature (0.45 MPa)	83.2°C	ISO 75-2/B
Rockwell Hardness	64	ASTM D785

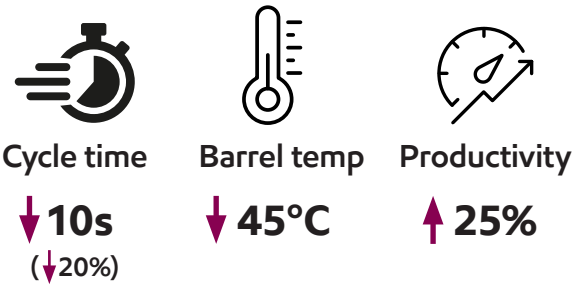
TENMA

Results

Exceed™ PP8864E1 demonstrated improved cycle time performance

- Achieved 20% cycle time reduction while meeting all targeted part requirements
  - Translated to 25% productivity increase
- Reduced barrel temperature potentially leads to:
  - Energy efficiency for molding
- Lower peak injection pressure potentially leads to:
  - Longer mold lifetime
  - More numbers of cavities (products) on the mold
  - Using lower tonnage (lower machine cost) injection molding machine





Motorcycle Part Weight ~700g
Reference Material = ICP (MFR 4)
Proposed Material = Exceed™ PP8864E1 (MFR 14)

By adopting Exceed™ PP8864E1, TENMA (HCM) VIETNAM CO., LTD. achieved significant operational benefits without compromising product quality. Faster cycle times, lower processing temperatures, and reduced injection pressure demonstrated performance and environmental advantages.

"We have recognized Exceed™ PP8864E1 as a high potential material that could significantly enhance the productivity and value of our key motorcycle product lines."

Mr. YOSHIHIKO MITAMURA
GENERAL DIRECTOR,
TENMA (HCM) VIETNAM CO., LTD.

Data from tests performed by or on behalf of ExxonMobil.

ExxonMobil Signature Polymers

Bring your impossible

ExxonMobil Signature Polymers was born from the belief that people fuel progress. From automotive and construction to packaging, agriculture, industrial, and beyond, we leverage the scale and reach of ExxonMobil to deliver the insights and innovations that empower our diverse, global partners to take their businesses to new heights. We continuously work to provide the listen-first, service-driven, game-changing collaboration that unlocks opportunities for our partners and advances their business goals.