

Next-generation TPE's For Challenging Applications

Three Decades of Growth

Since the introduction of thermoplastic elastomers (TPE's) in the late 1970's, this relative newcomer to the plastics industry has continued to gain market share because of its unique ability to combine the processing advantages of plastics with the elasticity of rubber. Characterized by their soft feel and cushioning nature, TPE's work well alone or can be bonded to a wide range of harder substrates to improve functionality and design. Industrial designers appreciate TPE's incredible range of aesthetic, sensory and performance characteristics that allow considerable design flexibility. Operations personnel value the easier, faster processing of TPE and its lower environmental impact. As a result, TPE's are today being used extensively in automotive, medical, electronic, electrical, industrial, packaging and consumer products markets worldwide.



Stretching the Boundaries

Polymax^{TPE} has become a leading contributor to the continued advancement of TPE due to the company's expertise in polymer science and advanced compounding technology. The company's technical team works closely with customers to create innovative solutions that improve manufacturing efficiency, reduce cost, and enhance the performance and design of products made with Polymax^{TPE} materials.



Cable grommets made with Polymax^{TPE} provide flexible seals to protect wire and automotive electronics in a car body. They offer high flexibility and good mechanical properties over a wide temperature range; excellent resistance to ozone and weathering; fast, cost-effective processing over competitive products; and excellent adhesion with conventional hard components.

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The Future of TPE

In a recent article published in the October 2014 issue of *Plastics Engineering*, Rob Banning, founder of plastics industry consulting firm Trimax LLC, stated that TPE's have now surpassed annual sales volume of \$5.2 billion worldwide. Mr. Banning predicts the continued growth of the category will be driven by technological advancements that are expanding the universe of performance parameters and applications for TPE including:

- **low taste, odor TPE** for sensory-sensitive applications requiring contact with food and consumable liquids
- **higher elastomer tear strength** with reduced TPE hardness levels (even down to 50-55 shore 'A' specialty alloys)
- highly precise levels of both **static and kinetic COF** in the elastomeric surface for proper component aesthetics
- **high temperature TPEs**
 - heat aging up to 150°C for hose, automotive, and industrial components
 - peak temperature up to 163°C for short term exposure in low-stress molded and extruded components
 - low compression set and stress relaxation in seals and gaskets, for performance up to 100°C in continuous use
- **bond strength** greater than 20 lbs/linear inch (3.6 kg/cm) in more than 15 specific alternative thermoplastic or TPE combinations, in substrates for two layer co-processing of extruded and molded components
- **low gel TPE** with flowability into very thin cross sections of profile extrusions, blown film, two and three layer blow molding, and thin wall injection molded components
- **outstanding colorability and UV stability** of TPE compounds, as proven in a broad variety of automotive, consumer, and building and construction industry components over the past two decades

Polymax^{TPE} medical grade materials in plunger seals are an alternative to rubber seals for single-use syringes. The seal helps to optimize plunger movement for accurate dosage control and ease of injection.



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