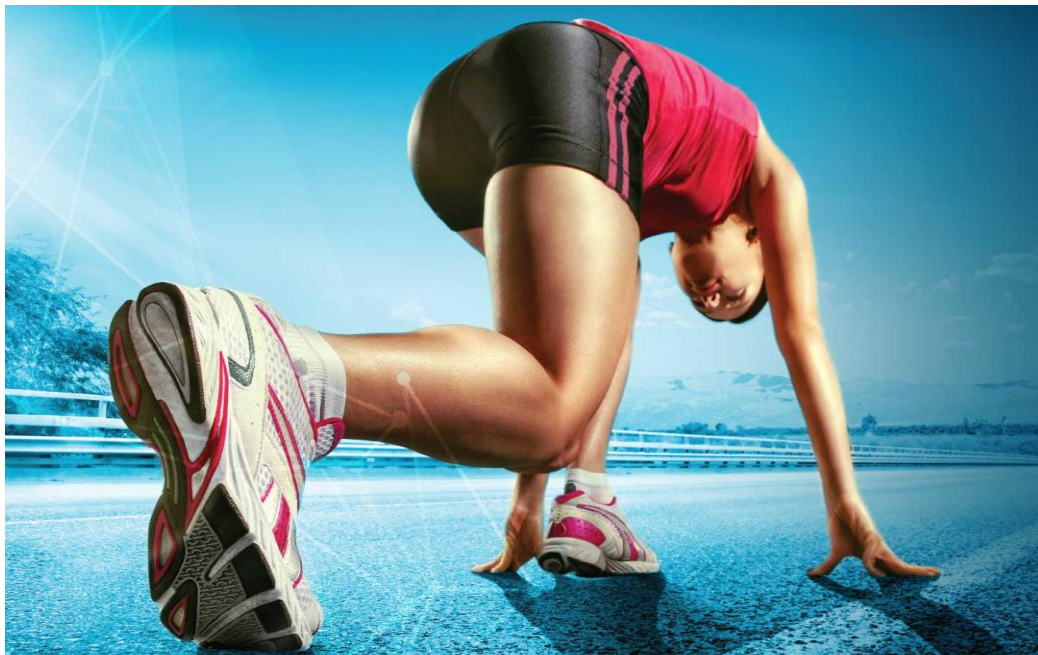


SOLUTION DATA SHEET

The Ideal Rubber Alternative: Performance and Sustainability with Lubrizol TPU



Markets	Industrial Parts (cables, foam pads, seals, hoses, printing blankets, belting, wheels), Automotive Parts, Footwear, Sporting Goods, Electronics, Consumer Goods
Polymers	ESTANE® TRX, ESTANE 58300 and Pearlthane™ CLEAR TPU
Key Benefits	<ul style="list-style-type: none"> • Sustainable, durable solutions • High mechanical properties • High productivity • High UV and abrasion resistance

Lubrizol's thermoplastic polyurethanes (TPUs) are highly versatile, durable, and engineered to meet the demanding requirements of a wide range of applications. We collaborate closely with our customers to develop specialized solutions tailored to their unique challenges, including the creation of new aesthetic designs. This ensures that we consistently achieve high-quality and excellent performance in our products.

Lubrizol's extensive portfolio of specialties commercialized under ESTANE®, Pearlthane™, and Pearlcoat™ TPUs offer strength and design versatility, as well as a broad range of chemistries and hardnesses that can go from as soft as rubber to as hard as rigid plastics.

Plasticizer-free, Lubrizol TPU, offers a recyclable* material with a unique combination of high abrasion and slip resistance and good flexibility with high rebound, versus traditional rubber, making it an ideal high-performing alternative. Emerging market trends in energy efficiency, regulatory changes, and sustainability are creating new opportunities for the application of Lubrizol TPU to replace rubber. Cable jacketing serves as one such example, and footwear is another one as can be observed below:

ESTANE® TRX70 TPU for Outsoles

Longer lasting, with traction comparable to rubber



Pearlthane™ CLEAR 15N85 TPU Copolymer for Midsoles

Low density foams.
Fast productivity. Automated vs traditional rubber outsole molding

Figure 1: Lubrizol TPU for rubber replacement in footwear

The following products also stand out with properties that potentially exceed those of rubber:

- ESTANE TRX70 TPU with excellent slip/abrasion resistance and fast cycle time.
- Pearlthane CLEAR 15N copolymer series with good rebound and a long life with minimum property loss in footwear has a broad scope of applications, and includes the differentiated and soft Pearlthane CLEAR 15N70 TPU (72 Shore A hardness).

Hose and tube applications are another example where ESTANE and Pearlthane TPUs are a high-performing alternative to rubber. Our TPU has good kinking resistance and is odorless, even in hot environments, both key attributes. Its lower weight also allows for easier handling and longer lengths of hose to be stored on each reel. ESTANE 58887 TPU is applied in flat hoses to give the best performance. If a softer material option is required, there are other hardnesses available in our portfolio. And we have polycaprolactone Pearlthane material that offers a high productivity solution for more efficient manufacturing. UV-resistant material solutions are also available.



Recently, Lubrizol has expanded its sustainable solutions with new bio-based** and mass balance grades.

Summary of benefits obtained by using Lubrizol TPU:

1. **Long-term performance**
 - Superior abrasion
 - High slip resistance and rebound
2. **Plasticizer-free**
3. **Cost-effective**
4. **Broad range of chemistries and hardnesses**

For more information on our solutions, you can visit the Lubrizol Engineered Polymers website: <https://go.lubrizol.com/EP>

**Recyclability is based on access to a readily available standard recycling program that supports such materials. Products may not be available in all areas.*

***Bio-based content as certified in accordance with ASTM D6866*

