

## Replace PVC or Enhance its Performance with Lubrizol TPU





Lubrizol offers a diverse portfolio of thermoplastic polyurethane (TPU) under various brand names, featuring a wide range of chemistries and hardness levels. Lubrizol's TPUs are known for their versatility and are designed to meet the stringent demands of numerous applications. We work closely with our customers to create customized solutions that address their specific challenges, ensuring that we deliver high-performance products to meet their needs.

Lubrizol TPU often outperforms plasticized polyvinyl chloride (PVC-P) in various applications, it offers several advantages over soft PVC such as dimensional stability, tensile strength, cohesiveness and toughness. It is the ultimate PVC-P replacement solution, but can also be used as an additive in PVC products to enhance performance.

## APPLICATIONS

- **Industrial Parts:**
  - Hoses and Tubes
  - Films And Conveyor Belts
  - Wire And Cable
  - Flooring
  - Roofing Membranes
  - Textiles
- **Automotive:** Interior components, dashboards, door panels, and seat covers
- **Consumer goods**
- **Footwear**



Lubrizol TPU can be produced in a transparent form and offers better clarity and aesthetic qualities compared to PVC, and also provides the following key performance attributes:

- Superior mechanical properties, such as higher tensile strength and better load-bearing capacity.
- Better resistance to abrasion, oils, greases, and many chemicals than PVC-P, making it more durable in demanding applications.
- Plasticizer-free and odorless.
- Flexibility and elasticity are retained over a wider temperature range compared to PVC-P. Lubrizol TPU resins have low temperature flexibility. While PVC-P can become brittle in cold conditions due to the plasticizers within its formula, Lubrizol TPU is tough at low temperatures.

Lubrizol TPU can be formulated with bio-based (reducing reliance on fossil fuels) or mass balance TPU, and it is recyclable.\*

There are two polymer solutions that stand out in Lubrizol's extensive TPU portfolio when it comes to PVC: ESTANE<sup>®</sup> and Pearlcoat<sup>™</sup> TPU. The first one, ESTANE TPU is so versatile that it can be an alternative to PVC-P in many applications, it is the flagship product platform with an extensive, high-performing range. And in the case of Pearlcoat TPU, it can be added to PVC to enhance its performance, instead of replacing it.

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

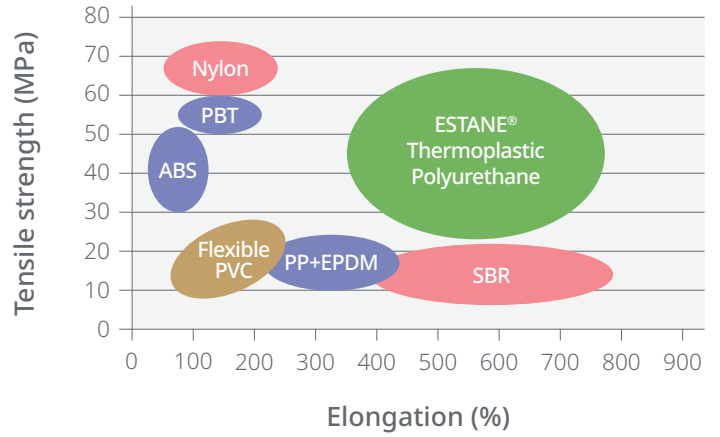


Figure 1: Tensile strength comparison between Lubrizol's ESTANE<sup>®</sup> TPU and other polymers, including PVC-P



When it comes to PVC compounds, Pearlcoat TPU can be added to improve impact or abrasion resistance and add durability and flexibility at low temperatures. Its high compatibility, easy blending or processing with PVC makes it a high-performing solution. It can be compounded or overmolded onto PVC to offer a better grip on wet surfaces.

The grade Pearlcoat DIPP 119 TPU is a unique example for PVC compounding. Used as an additive, Lubrizol TPU can make PVC parts more durable, and provide higher abrasion resistance as can be seen in the chart (right):

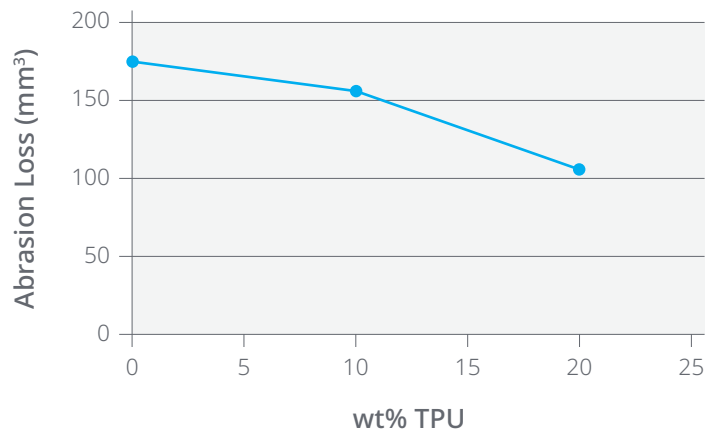


Figure 2: Abrasion loss improvement thanks to TPU in PVC

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Since the invention of Bio TPU\* almost twenty years ago, Lubrizol has been evolving to provide more sustainable solutions in the TPU market, our Engineered Polymers expert team is well positioned to help other markets start the journey to sustainability without losing any high-performing product properties. By leveraging cross-technological innovations, our specialties help us to empower our clients to thrive in a rapidly evolving landscape. PVC-P replacement is one of the areas Lubrizol solutions can make an impact in, to make the future more sustainable.

For more detailed information on our offering, you can visit the Lubrizol Engineered Polymers website: [go.lubrizol.com/EP](https://go.lubrizol.com/EP)

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

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