



Performance is in our nature.

susterra[®]
bio-based performance



Susterra® Propanediol for Elastomers

Susterra® propanediol is the building block that delivers high performance in a variety of applications, from cast parts and thermoplastic polyurethanes (TPUs) to molded and extruded thermoplastic urethanes. Made from renewably sourced materials and certified 100% bio-based by the

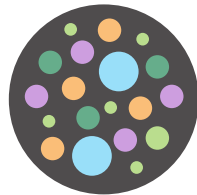
USDA, Susterra® propanediol offers **enhanced processing with shorter demolding times, improved flexibility and excellent overmolding adhesion** versus traditional chain extenders for TPUs where the hardness is less than 70%.

How it's made

Susterra® propanediol is manufactured through a proprietary fermentation process using plant-derived glucose instead of petroleum-based feedstocks. The resulting product is 99.7% pure.



Harvest



Fermentation



Refining

The greener alternative

From "cradle-to-gate" (extraction and production prior to delivery to the consumer), Susterra® propanediol produces 56% less greenhouse gas emissions and consumes 42% less nonrenewable energy than petroleum-based

1,3-propanediol. Compared with BDO, Susterra® propanediol produces 52% less greenhouse gas emissions and uses 32% less nonrenewable energy from cradle-to-gate.



At full capacity, our process achieves greenhouse gas emissions reductions equivalent to taking 40,000 passenger cars off the road for one year.



At full capacity, our process saves enough nonrenewable energy to power 1 million 100W incandescent lightbulbs for one year.

DuPont Tate & Lyle Bio Products bio-based 1,3-propanediol LCA data based on Loudon process design data.

How it performs

Enhanced processing with shorter molding times

In studies, Susterra® propanediol was evaluated against traditional chain extenders as a polyester TPU for a molding application. The TPU samples with Susterra® propanediol demonstrated faster molding times, which may lead to cycle time improvements for TPU manufacturers and cost savings for brand owners.

Improved flexibility

TPUs with Susterra® propanediol exhibited excellent low-temperature flexibility when compared to butanediol- (BDO-) based TPU samples.

Excellent overmolding adhesion

Samples were molded with a polycarbonate substrate and peeled apart. Adhesion on the samples using BDO was inconsistent while the higher melting temperature (Tm) of the Susterra® propanediol samples led to better adhesion.

As the hardness of the TPU decreases and PDO is used as the chain extender, the Tm increases.

For TPUs of the same hardness, the higher Tm will lead to better adhesion during over-molding.

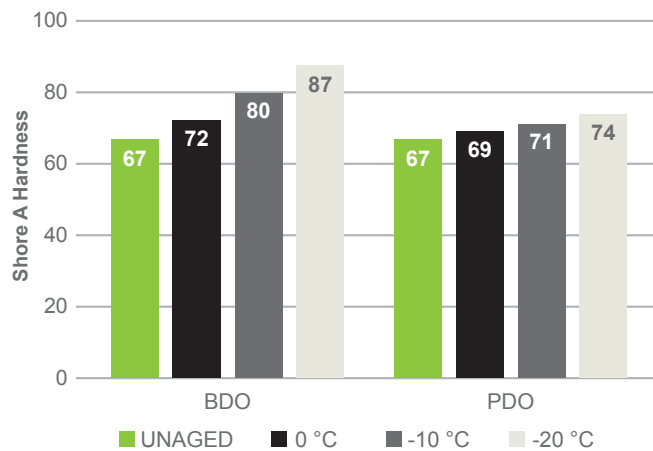
Peel strength was tested with a polycarbonate substrate.

Polyester TPU Chain Extender Example with AA/BDO/EG polyol

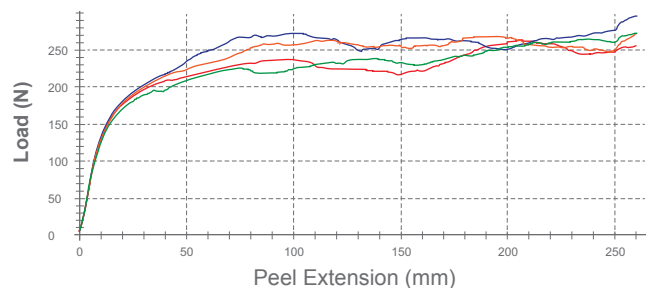
Polyol Chain Extender	AA/BDO/EG BDO	AA/BDO/EG PDO
Yellow Index	5.3	6.0
Hardness, Shore A	67	67
Molding Time (sec)	30	20
Tg by DSC (°C)	-38	-38
Tm by DSC (°C)	140	177

For TPUs of the same hardness where the hardness is less than 70, PDO may shorten molding times.

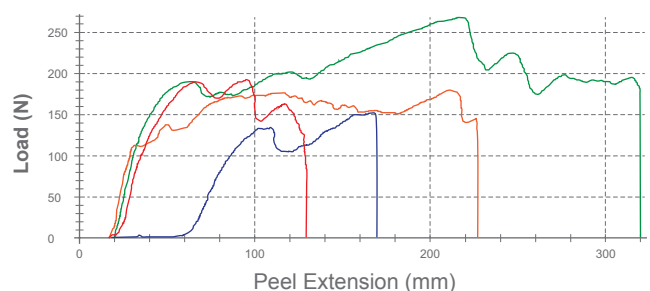
Low-Temperature Test



PDO Peel Strength - 4 samples



BDO Peel Strength - 4 samples



susterra-performs.com

About DuPont Tate & Lyle Bio Products

DuPont Tate & Lyle Bio Products Company, LLC., is a joint venture between DuPont, a global science company, and Tate & Lyle, a world-leading renewable food and industrial ingredients company. DuPont Tate & Lyle Bio Products provides natural and renewably sourced ingredients that enhance product performance. We offer solutions for a wide variety of markets and applications through our bio-based performance brands, Susterra® and Zemea®. For more information, visit www.duponttateandlyle.com

