DuPont Tate & Lyle Bio Products and INVISTA's CORDURA® brand collaborate to bring new eco-efficient textiles to market

DuPont Tate & Lyle Bio Products

Who We Are

By bringing together the unrivaled track record of DuPont, a world leader in science and innovation, and the technical excellence of Tate & Lyle, a world-leading specialty ingredients and solutions company, scientists and engineers from this joint venture have developed a proprietary process that uses plant-based feedstocks instead of petroleum-based feedstocks to produce 1,3-propanediol.

For 10 years, Susterra® propanediol has been the renewably sourced building block that delivers high performance in a variety of polyurethane applications, from footwear and water proof films, to artificial leather and coatings. Together, with our customers, we can create high-performance products that enhance people's lives, protect the environment, and reduce the world's dependence on petroleum.

Performance is in our nature.

For more information about Susterra®

DuPont Tate & Lyle Bio Products Company, LLC.

www.susterra-performs.com
www.facebook.com/DTLSusterra
www.twitter.com/DTLSusterra
www.duponttateandlylebioproducts-youtube.com/
1-866-404-7933

Eco-Efficient

Eco-efficiency has been proposed as one of the main tools to promote a transformation from unsustainable development to one of sustainable development. It is based on the concept of creating more goods and services while using fewer resources and creating less waste and pollution. "It is measured as the ratio between the (added) value of what has been produced (e.g. GDP) and the (added) environment impacts of the product or service (e.g. S02 emissions)." Yadong, Y (2013).

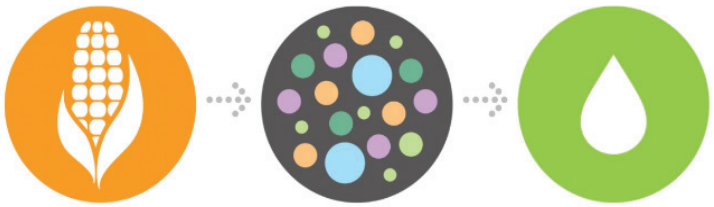
The global demand for eco-efficient materials across industries is rising and the textile market is undergoing a pivotal shift to reduce its environmental footprint. There is a pressing need to transform the way gear and apparel is made and leverage more sustainable materials from natural resources.

Bio-Based Performance

One of the ways leading designers of apparel, footwear and gear are incorporating sustainable materials is by turning to DuPont Tate & Lyle Bio Products. Susterra® propanediol, by DuPont Tate & Lyle, is the bio-based building block that delivers high performance across a wide variety of polyurethane applications. Not only is it naturally resourced but depending on the chemistry selected, the urethane's structural block can yield a final product that delivers flexibility at low temperatures, good elasticity, and excellent abrasion performance. Product designers and engineers can incorporate sustainable bio-based performance into a variety of final consumer products.

Renewably Sourced — 100% USDA bio-based material, that is sustainably sourced

DuPont Tate & Lyle's production facility is a blueprint for successful innovation in industrial biotechnology. It brings together the best of two organizations, DuPont and Tate & Lyle, to create a first-to-market process and product that continue to demonstrate versatility and functionality in the global marketplace. It has applied the tools of modern biotechnology to enable high performance products that enhance people's lives, protect the environment and reduce the world's dependence on petroleum.



Harvest
Renewably sourced feedstocks are harvested, dried and then wet-milled to create a range of carbohydrate rich feedstocks such as glucose.

Fermentation
Glucose is converted into 1,3 propanediol using a patented microorganism under exact temperatures and conditions.

Refining
The 1,3 propanediol is refined to a final purity of 99.7% by deactivating and removing the microorganism, water, and other byproducts.

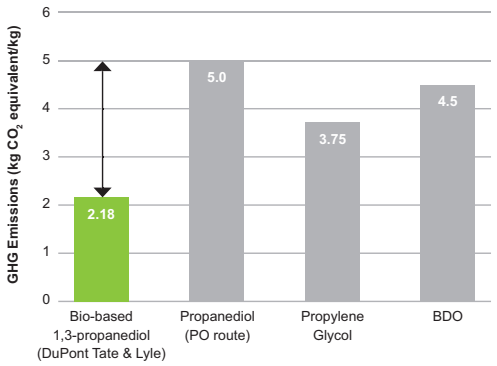
CORDURA® BRAND FABRIC + susterra® bio-based performance

Sustainable — manufactured with the long-term environmental footprint in mind

In addition to being renewably sourced, Susterra® is manufactured using a sustainable process that produces 50% greenhouse gas emissions and consumes 42% less non-renewable energy than equivalent petroleum-based diols. At the manufacturing facility's full capacity, that is equivalent to taking 40,000 passenger cars off the road and turning off one million 100W incandescent lightbulbs for one full year.

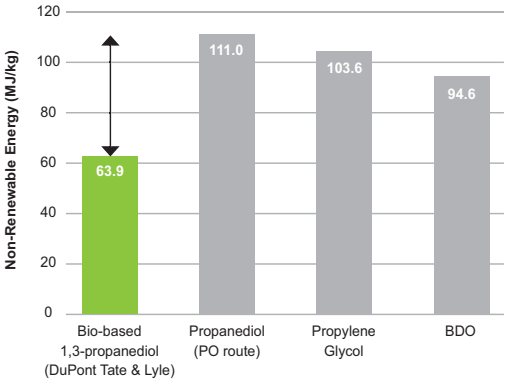
The Greener Alternative

From "cradle-to-gate" (extraction and production prior to delivery to customers), bio-based 1,3-propanediol produces 56% less greenhouse gas emissions and consumes 42% less nonrenewable energy than petroleum-based 1,3-propanediol. Compared with propylene glycol (PG), bio-based 1,3-propanediol produces 42% less greenhouse gas emissions and uses 38% less nonrenewable energy from cradle to gate. Compared with butanediol (BDO), bio-based 1,3-propanediol produces 52% less greenhouse gas emissions and uses 32% less nonrenewable energy from cradle-to-gate."



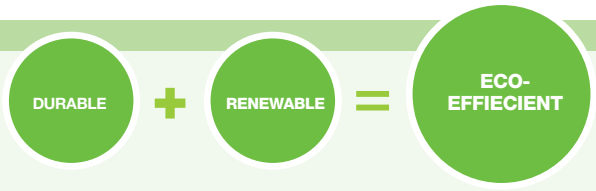
Greenhouse Gas Emissions
56% less than Propanediol
42% less than Propylene Glycol
52% less than BDO

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



Non-Renewable Energy Use
42% less than Propanediol
38% less than Propylene Glycol
32% less than BDO

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



A Future Where Durability & Sustainability Interconnect.
INVISTA's CORDURA® brand and DuPont Tate & Lyle Bio Products have collaborated to bring designers the first in a series of eco-innovations powered by the long-lasting durability of CORDURA® fabrics. This new marriage of technologies means one outcome: durable next generation fabrics featuring high performance bio-based Susterra® propanediol coatings and membranes.

To help make this idea a reality, they have engaged their first authorized footwear and apparel mills, Tiong Liong and Everest, to develop durable bio-based CORDURA® fabric solutions.

Footwear:
Tiong Liong's CORDURA® EcoMade and CORDURA® AFT fabric innovations are laminated with a thermoplastic polyurethane (TPU) bio-based membrane based on Susterra® propanediol, which is designed so that perspiration can get out but water cannot get in, helping to keep your feet dry and comfortable in all weather.

CORDURA® EcoMade fabric:
- Fabrics made with recycled polyester yarn helps reduce energy consumption and extend the useful life of polyester

CORDURA® AFT fabric:
- High breathability
- Enhanced tear and abrasion resistance

Susterra® propanediol-based membrane:
- Waterproof and breathable
- Contains up to 25% renewably sourced materials by weight.

Apparel:
Everest's CORDURA® Naturalle™ fabrics incorporate a polyurethane bio-based membrane or coating which contains 50% renewable sourced materials by weight. These fabrics are engineered to help keep your body dry and comfortable in all kinds of weather. The Susterra® propanediol based layer demonstrates good hydrolysis resistance, excellent low temperature flexibility and elasticity thus allowing the material to be incorporated with stretch fabrics.

CORDURA® Naturalle™ fabric:
- Stylish durability and exceptional strength-to-weight ratio
- Resistant to tears, scuffs and abrasions

Susterra® propanediol-based polyurethane coating:
- Windproof, warm and breathable
- Good hydrolysis resistance
- Excellent low-temperature flexibility

Susterra® propanediol-based polyurethane membrane:
- Waterproof and breathable
- Outstanding elasticity for stretch fabrics that move with you
- Contains up to 50% renewably sourced materials by weight for added mobility.

Susterra® is a registered trademarks of DuPont Tate & Lyle Bio Products. CORDURA® is a trademark of INVISTA for durable fabrics.