



Performance is in our nature.

susterra[®]
bio-based performance



Susterra® Propanediol for Low-Temperature Heat Transfer

Susterra® 1,3-propanediol is a high-performing, food-safe alternative to conventional glycols for low-temperature heat-transfer applications in the beverage, brewing and food industries. Made from renewably sourced materials

and certified 100% bio-based by the USDA, it offers the performance benefits of **improved viscosity at lower temperatures** and **improved freezing-point depression** versus propylene glycol.



Susterra® propanediol offers performance advantages over propylene glycol in these and other low-temperature heat-transfer applications.

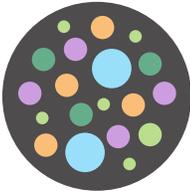
- Food and beverage process cooling
- Immersion freezing
- Liquid food and dairy products cooling
- Fermentation and maturation cooling
- Carbonated beverage cooling
- Plastic bottle blow-molding cooling
- Ice systems

How it's made

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



Harvest



Fermentation

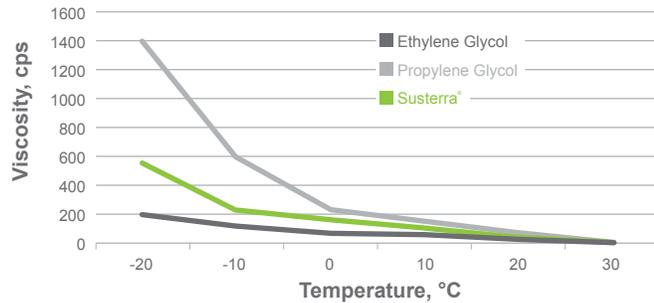


Refining

How it performs

Improved viscosity at lower temperatures

Glycol Viscosity Comparison



Propylene glycol and Susterra® propanediol have the same formula and molecular weight, but their molecular structures are slightly different. This structural difference gives Susterra® propanediol an improved viscosity profile at low temperatures, which can reduce the amount of power consumption by recirculating pumps and enable systems to achieve lower minimum operating temperatures.

Glycol Comparison – Pump Power Usage

Property	Propanediol, 30%	Propylene Glycol, 30%
Freezing point, °F (°C)	9.4°F (-12.6°C)	9.2°F (-13°C)
Density (0°C), kg/m ³	1026	1030
Kinematic viscosity, centistokes	42	69
Power, (kW)	3.1	3.4
Power savings	8.9%	N/A

Operating temperature: 32°F Flow: 175 gpm
 Centrifugal pump: 5 hp Head: 50 ft

In studies, Susterra® propanediol exhibited a significantly lower kinematic viscosity than propylene glycol under the same system operating conditions, for an 8.9% reduction in power consumption.

Improved freezing-point depression

Susterra® propanediol exhibits a lower freezing point at higher glycol percentages than either ethylene glycol or propylene

glycol, offering more options for system design. For example, an aqueous glycol system using 80% Susterra® propanediol will not freeze until close to -130° F.

The greener alternative

From “cradle-to-gate” (extraction and production prior to delivery to the consumer), Susterra® propanediol produces 56% less greenhouse gas (GHG) emissions and consumes 42% less non-renewable energy than petroleum-based 1,3-propanediol. Compared with propylene glycol, Susterra® propanediol produces 42% less greenhouse gas emissions

and uses 38% less non-renewable energy from cradle-to-gate. It is readily biodegradable, non-toxic and approved for incidental food contact under the NSF International HTX-1 specification. In fact, some countries have approved its use as a food ingredient.



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.

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

