



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.

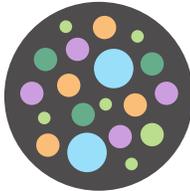
- Food and beverage process cooling
- Immersion freezing
- Liquid food and dairy products cooling
- Fermentation and maturation cooling
- Carbonated beverage cooling
- Plastic bottle blow-molding cooling
- Ice systems

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

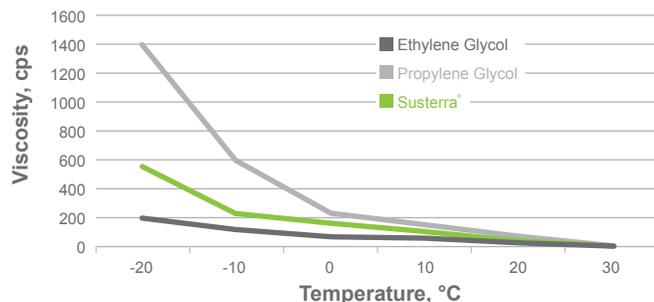


Refining

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.

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 innovator, and Tate & Lyle, a world-leading specialty ingredients and solutions 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.susterra-performs.com.

