

COVATIONBIO|PDO

susterra



14.5

BEER TEMPERATURE

BEER PUMP

**Susterra[®] USP-FG
propanediol
(1,3-propanediol or PDO)
for low-temperature
heat transfer
in the food and
beverage industry**

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

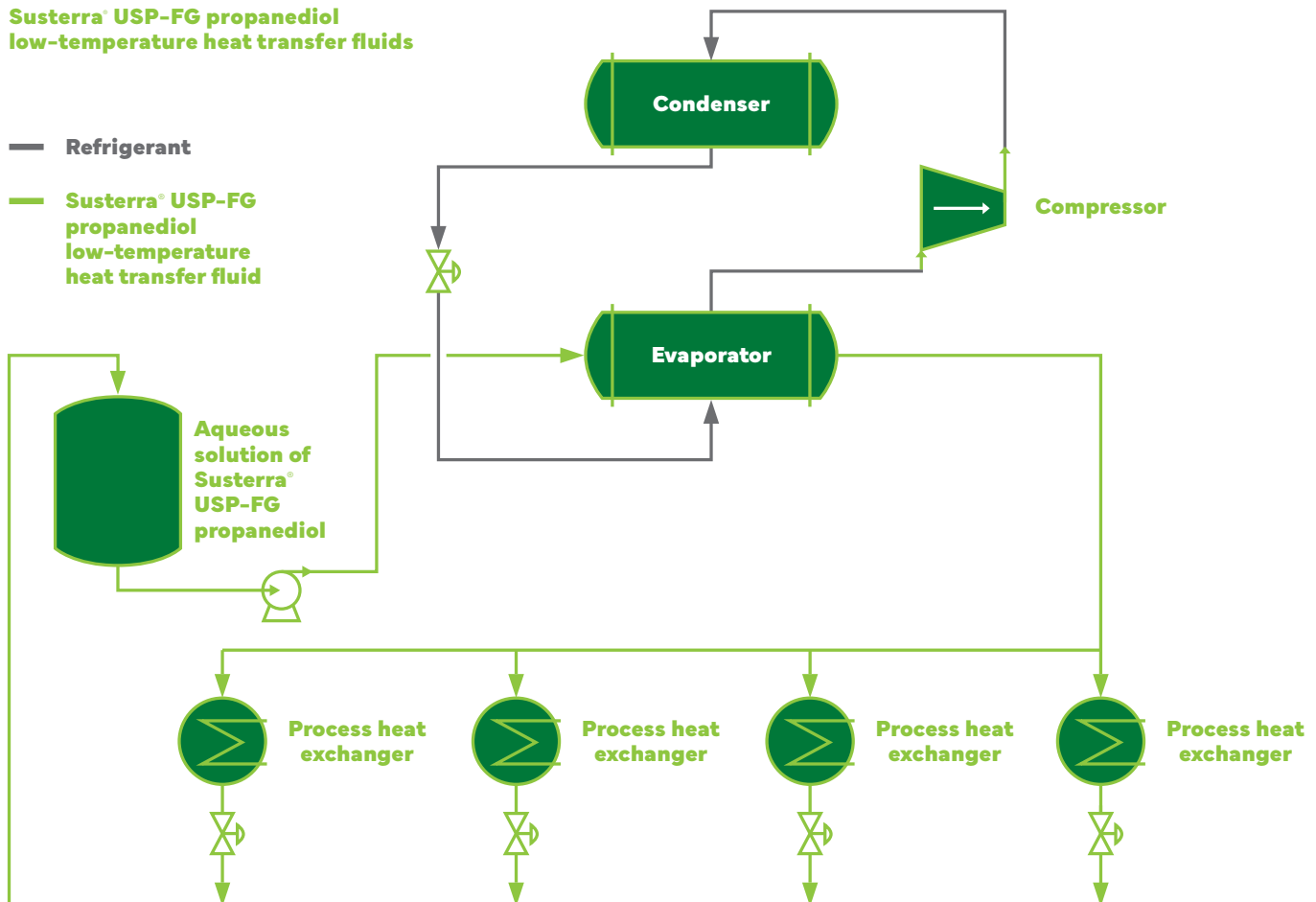
- Food and beverage process cooling
- Immersion freezing
- Liquid food and dairy products cooling
- Fermentation and maturation cooling
- Carbonated beverage cooling
- Plastic bottle blow-molding cooling
- Ice systems

Susterra® PDO for low-temperature heat transfer

Susterra® USP-FG 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

by the USDA BioPreferred® program as 100% bio-based, it offers the performance benefits of reduced viscosity and energy-saving opportunities versus propylene glycol.

Susterra® USP-FG propanediol low-temperature heat transfer fluids



How it's made

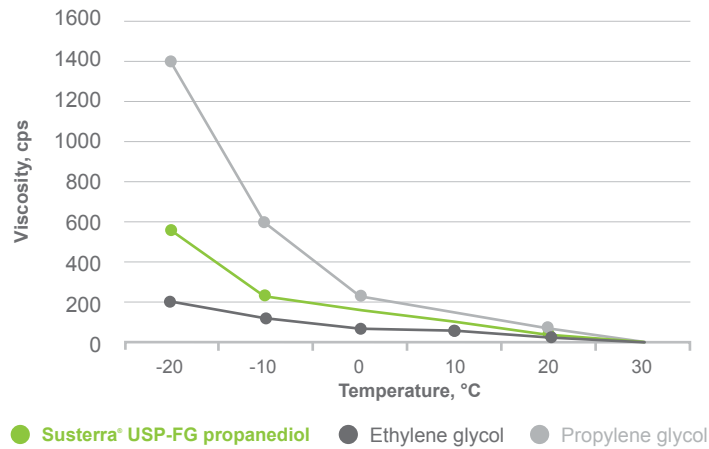
Susterra® USP-FG propanediol is manufactured through a proprietary fermentation process uses regeneratively farmed industrial dent corn feedstock (dextrose) instead of petroleum-based feedstocks. The resulting product is 99.9% pure.



How it performs

Improved viscosity at lower temperatures

Glycol viscosity comparison



Propylene glycol and Susterra[®] USP-FG propanediol are isomers (same formula and molecular weight), but their molecular structures are slightly different. These structural differences enable Susterra[®] to have a higher boiling point, improved thermal stability and reduced viscosity at low temperature. This leads to reducing the fluid flow rates needed to achieve the same heat transfer and process cooling, reduced energy consumption to operate the pump, and potentially fewer maintenance costs on the pump over the life of the system.

Glycol comparison – pump power usage

Property	Susterra [®] USP-FG 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

Studies have shown that, Susterra[®] USP-FG propanediol exhibits a significantly lower kinematic viscosity than propylene glycol under the same system operating conditions, resulting in an 8.9% reduction in power consumption.

The sustainable alternative

From “cradle-to-gate” (extraction and production prior to customer delivery), Susterra[®] USP-FG propanediol produces 47% less greenhouse gas (GHG) emissions and consumes 49% less nonrenewable energy than petroleum-based 1,3-propanediol. Compared to petroleum-based propylene

glycol, Susterra[®] USP-FG propanediol produces 42% less greenhouse gas emissions and uses 41% less nonrenewable energy from cradle-to-gate. It is readily biodegradable, nontoxic and approved for incidental food contact under the NSF International HTX-1 specification.

Susterra[®] propanediol life cycle assessment data based on Loudon process design data; peer-reviewed by Five Winds International.



CovationBioPDO.com

Susterra® USP-FG propanediol
Learn more at CovationBioPDO.com/Susterra

CovationBio PDO offers a plant-based, natural and renewably sourced diol that enhances product performance. We offer solutions for a wide variety of markets and applications through our 100% plant-based performance brands, Susterra® and Zemea®. For more information, visit CovationBioPDO.com.

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