



Susterra® propanediol: non-inhibited glycol-based low- temperature heat transfer fluid

Typical properties of Susterra® propanediol	Unit	Value
Composition		
1,3-propanediol	(% by weight)	99.7
Water & impurities	(% by weight)	0.3
Color	(Hazen/APHA)	0 – 15
Specific gravity		1.0531
Boiling point	°F / °C	417 / 214
Freezing point	°F / °C	-11.2 / -24
Viscosity	cP @ 20°C	49
Viscosity	cSt @ 20°C	46

(LHTHF) systems commonly found in industrial beverage manufacturers like breweries and distilleries. The use of Susterra® propanediol can deliver comparable performance to an ethylene glycol-based system while delivering the safety and toxicity profile of a propylene glycol-based system. Susterra® is approved for incidental food contact (NSF International, HTX-1 specification).

In addition to being renewably sourced, bio-based 1,3-propanediol is manufactured using a sustainable process that produces 47% and 42% less greenhouse gas emissions and consumes 49% and 41% less nonrenewable energy than equivalent petroleum-based 1,3-propanediol and petroleum-based propylene glycol, respectively.

Recommended use temperature range: 40°F (4.44°C) to -41.8°F (-41.0°C)

Suitable applications: secondary cooling and heating; freezing and burst protection of pipes; various deicing, defrosting and dehumidifying applications, and a base for engine coolants where stability over a wide range of temperatures is important. In general, if Susterra® 1,3-propanediol is being substituted for propylene glycol, the same inhibitor package can be used.

For **health and safety information** for this product, contact Primient Covation LLC directly at 1-866-404-7933 (page 1 of Susterra® Propanediol SDS).

Summary

Susterra® propanediol is a 100% bio-based, petroleum-free glycol derived from fermentation of corn sugar, resulting in the same chemical formula as propylene glycol with a slightly different structure (1,3-propanediol vs 1,2-propylene glycol, respectively). This structural difference gives it some unique properties, including low-temperature viscosity, a higher boiling point and resistance to degradation, thus making it an ideal glycol candidate for use in low-temperature heat transfer fluid

Typical freezing point of Susterra® propanediol aqueous solutions¹

Vol% Susterra® PDO	WT% Susterra® PDO	Density PDO	Density mixture	Density PDO/ density mixture	FP, °F	FP, °C
20	20.78	1.0531	1.0135	1.0391	20.07	-6.63
25	25.88	1.0531	1.0173	1.0352	15.65	-9.09
30	30.94	1.0531	1.0210	1.0314	10.50	-11.94
35	35.95	1.0531	1.0253	1.0271	4.64	-15.20
40	40.93	1.0531	1.0295	1.0229	-2.03	-18.90
45	45.86	1.0531	1.0333	1.0192	-9.80	-23.22
50	50.77	1.0531	1.0370	1.0155	-19.25	-28.47
55	55.68	1.0531	1.0402	1.0124	-31.34	-35.19
60	60.55	1.0531	1.0434	1.0093	-47.48	-44.16
100	100.00	1.0531	1.0531	1.0000	-11.20	-24.00

¹Typical properties, not to be construed as specifications.

**Saturation properties for non-inhibited heat transfer fluid
at 20% Susterra® 1,3-propanediol concentration by volume**

Temperature		Density		Specific heat		Therm. cond.		Viscosity	
°F	°C	lbm/ft ³	kg/m ³	BTU/lbm °F	J/kg-K	BTU/hr-ft-°F	W/mK	lbm/ft-hr	mPa-s
25	-3.89	63.710	1021.532	0.9654	3963.679	0.2690	0.4385	14.086	5.821
30	-1.11	63.681	1021.568	0.9686	3971.189	0.2715	0.4413	12.343	5.100
35	1.67	63.646	1021.576	0.9718	3978.699	0.2739	0.4440	10.874	4.493
40	4.44	63.606	1021.556	0.9750	3986.209	0.2763	0.4467	9.630	3.979
45	7.22	63.561	1021.507	0.9783	3993.719	0.2786	0.4493	8.572	3.542

**Saturation properties for non-inhibited heat transfer fluid
at 30% Susterra® 1,3-propanediol concentration by volume**

Temperature		Density		Specific heat		Therm. cond.		Viscosity	
°F	°C	lbm/ft ³	kg/m ³	BTU/lbm °F	J/kg-K	BTU/hr-ft-°F	W/mK	lbm/ft-hr	mPa-s
15	-9.44	64.259	1032.450	0.9108	3730.310	0.2426	0.4007	24.772	10.236
20	-6.67	64.212	1032.146	0.9149	3739.763	0.2447	0.4030	21.400	8.843
25	-3.89	64.161	1031.830	0.9190	3749.215	0.2467	0.4052	18.591	7.682
30	-1.11	64.108	1031.501	0.9230	3758.668	0.2487	0.4074	16.241	6.711
35	1.67	64.052	1031.159	0.9271	3768.120	0.2507	0.4096	14.263	5.894
40	4.44	63.993	1030.804	0.9312	3777.573	0.2526	0.4117	12.590	5.203
45	7.22	63.930	1030.437	0.9352	3787.025	0.2545	0.4139	11.170	4.616

**Saturation properties for non-inhibited heat transfer fluid
at 40% Susterra® 1,3-propanediol concentration by volume**

Temperature		Density		Specific heat		Therm. cond.		Viscosity	
°F	°C	lbm/ft ³	kg/m ³	BTU/lbm °F	J/kg-K	BTU/hr-ft-°F	W/mK	lbm/ft-hr	mPa-s
0	-17.78	65.303	1049.591	0.8279	3393.271	0.2178	0.3652	57.512	23.765
5	-15.00	65.239	1049.044	0.8328	3404.666	0.2196	0.3671	48.654	20.105
10	-12.22	65.175	1048.495	0.8377	3416.061	0.2213	0.3689	41.412	17.113
15	-9.44	65.109	1047.943	0.8426	3427.456	0.2230	0.3707	35.459	14.652
20	-6.67	65.043	1047.390	0.8475	3438.851	0.2247	0.3726	30.538	12.619
25	-3.89	64.975	1046.833	0.8524	3450.246	0.2264	0.3743	26.448	10.929
30	-1.11	64.907	1046.273	0.8573	3461.641	0.2280	0.3761	23.032	9.517
35	1.67	64.837	1045.710	0.8622	3473.036	0.2295	0.3779	20.163	8.332
40	4.44	64.765	1045.144	0.8671	3484.431	0.2310	0.3796	17.744	7.332
45	7.22	64.692	1044.573	0.8720	3495.826	0.2325	0.3813	15.693	6.485



**Saturation properties for non-inhibited heat transfer fluid
at 50% Susterra[®] 1,3-propanediol concentration by volume**

Temperature		Density		Specific heat		Therm. cond.		Viscosity	
°F	°C	lbm/ft ³	kg/m ³	BTU/lbm °F	J/kg-K	BTU/hr-ft-°F	W/mK	lbm/ft-hr	mPa-s
-15	-26.11	66.105	1061.720	0.7197	2960.072	0.1966	0.3339	159.154	65.766
-10	-23.33	66.026	1061.013	0.7255	2973.409	0.1981	0.3355	131.029	54.144
-5	-20.56	65.948	1060.307	0.7312	2986.747	0.1996	0.3371	108.612	44.881
0	-17.78	65.869	1059.604	0.7369	3000.084	0.2011	0.3386	90.632	37.451
5	-15.00	65.790	1058.901	0.7427	3013.422	0.2025	0.3401	76.121	31.455
10	-12.22	65.711	1058.200	0.7484	3026.759	0.2039	0.3416	64.339	26.587
15	-9.44	65.632	1057.499	0.7541	3040.097	0.2052	0.3431	54.718	22.611
20	-6.67	65.553	1056.799	0.7599	3053.435	0.2065	0.3445	46.815	19.345
25	-3.89	65.473	1056.100	0.7656	3066.772	0.2078	0.3459	40.288	16.648
30	-1.11	65.392	1055.400	0.7713	3080.110	0.2090	0.3473	34.869	14.409
35	1.67	65.311	1054.700	0.7771	3093.447	0.2102	0.3487	30.345	12.539
40	4.44	65.229	1054.000	0.7828	3106.785	0.2114	0.3501	26.550	10.971
45	7.22	65.146	1053.298	0.7886	3120.122	0.2125	0.3514	23.351	9.649

**Saturation properties for non-inhibited heat transfer fluid
at 60% Susterra® 1,3-propanediol concentration by volume**

Temperature		Density		Specific heat		Therm. cond.		Viscosity	
°F	°C	lbm/ft ³	kg/m ³	BTU/lbm °F	J/kg-K	BTU/hr-ft-°F	W/mK	lbm/ft-hr	mPa-s
-45	-42.78	67.442	1079.710	0.5667	2384.872	0.1725	0.2996	1156.985	478.093
-40	-40.00	67.356	1078.946	0.5733	2400.152	0.1740	0.3010	893.240	369.107
-35	-37.22	67.270	1078.180	0.5798	2415.432	0.1754	0.3024	695.493	287.394
-30	-34.44	67.183	1077.411	0.5864	2430.712	0.1768	0.3038	546.040	225.636
-25	-31.67	67.096	1076.639	0.5930	2445.992	0.1782	0.3052	432.203	178.596
-20	-28.89	67.008	1075.865	0.5995	2461.272	0.1795	0.3065	344.829	142.491
-15	-26.11	66.920	1075.088	0.6061	2476.553	0.1808	0.3078	277.267	114.573
-10	-23.33	66.831	1074.308	0.6127	2491.833	0.1821	0.3091	224.643	92.828
-5	-20.56	66.741	1073.526	0.6192	2507.113	0.1833	0.3104	183.363	75.770
0	-17.78	66.650	1072.740	0.6258	2522.393	0.1845	0.3117	150.757	62.296
5	-15.00	66.559	1071.951	0.6324	2537.673	0.1856	0.3129	124.828	51.582
10	-12.22	66.468	1071.160	0.6390	2552.953	0.1867	0.3141	104.074	43.006
15	-9.44	66.375	1070.365	0.6455	2568.233	0.1877	0.3153	87.355	36.097
20	-6.67	66.282	1069.567	0.6521	2583.513	0.1888	0.3164	73.803	30.497
25	-3.89	66.187	1068.765	0.6587	2598.793	0.1897	0.3176	62.751	25.930
30	-1.11	66.093	1067.960	0.6652	2614.073	0.1907	0.3187	53.686	22.184
35	1.67	65.997	1067.152	0.6718	2629.353	0.1916	0.3198	46.207	19.094
40	4.44	65.900	1066.341	0.6784	2644.633	0.1924	0.3209	40.002	16.530
45	7.22	65.803	1065.526	0.6849	2659.913	0.1933	0.3220	34.827	14.391