Technical Data Sheet

DOWTHERM™ 4000

Product Type

Inhibited Ethylene Glycol-based heat transfer fluid

Applications

- Thermally demanding applications and those where long fluid life and extended maintenance intervals are desired
- Single fluid process heating and cooling

Recommended Use Temperature Range

-50°C (-60°F) to 175°C (350°F)

Description

DOWTHERM 4000 heat transfer fluid features the highest maximum use temperature of any glycol. This fluid is specially formulated with inhibitors to offer greater thermal stability and corrosion protection. The fluid is dyed fluorescent orange to aid in leak detection. Solutions in water provide freeze protection to below -50°C (-60°F) and burst protection to below -73°C (-100°F).

Typical Properties†

Composition (% by weight)	
Ethylene Glycol	92
Performance Additives	8
Color	Fluorescent orange
Specific Gravity 15/15°C (60/60°F)	1.130-1.144
pH of Solution (50% glycol)	8.5-9.0
Reserve Alkalinity (min.)	25.0 ml

†Typical properties, not to be construed as specifications. Complete sales specifications are available on request.

Typical Concentrations of DOWTHERM 4000 Fluid Required to Provide Freeze and Burst Protection at Various Temperatures

Temperature °C	Temperature (°F)	Percent DOWTHERM 4000 Fluid Concentration Required For Freeze Protection Volume %	For Burst Protection Volume %
-7	(20)	17.3	11.9
-12	(10)	27.1	18.4
-18	(0)	35.7	23.8
-23	(-10)	42.2	28.1
-29	(-20)	47.6	32.5
-34	(-30)	51.9	32.5
-40	(-40)	56.3	32.5
-46	(-50)	60.6	32.5
-51	(-60)	64.9	32.5

Note: These figures are examples only and may not be appropriate to your situation. Generally, for an extended margin of protection, you should select a temperature in this table that is at least 3°C (5°F) lower than the expected lowest ambient temperature. Inhibitor levels should be adjusted for solutions of less than 20% glycol. Contact Dow for information on specific cases or further assistance.

Typical Freezing and Boiling Points of DOWTHERM 4000 Fluid†

Wt. % Ethylene Glycol	Vol. % Ethylene Glycol	Wt. % DOWTHERM 4000	Vol. % DOWTHERM 4000	Freezing Point °C	Freezing Point (°F)	Boiling Point °C @ 101 kPa (°F @ 760 mmHG)		Degree Brix††	Refractive Index 22°C (72°F)
0.0	0.0	0.0	0.0	0	(32.0)	100.0	(212)	0.0	1.3328
5.0	4.4	5.4	4.8	-1.4	(29.4)	100.6	(213)	3.8	1.3378
10.0	8.9	10.8	9.6	-3.2	(26.2)	101.1	(214)	6.8	1.3428
15.0	13.6	16.2	14.7	-5.4	(22.2)	101.7	(215)	9.9	1.3478
20.0	18.1	21.6	19.6	-7.8	(17.9)	102.2	(216)	13.0	1.3530
25.0	22.9	27.1	24.8	-10.7	(12.7)	103.3	(218)	16.1	1.3582
30.0	27.7	32.5	30.0	-14.1	(6.7)	104.4	(220)	19.2	1.3635
35.0	32.6	37.9	35.3	-17.9	(-0.2)	105.0	(221)	22.3	1.3688
40.0	37.5	43.4	40.6	-22.3	(-8.1)	105.6	(222)	25.3	1.3741
45.0	42.5	48.7	46.0	-27.5	(-17.5)	106.7	(224)	28.3	1.3796
50.0	47.6	54.1	51.4	-33.8	(-28.9)	107.2	(225)	31.2	1.3849
55.0	52.7	59.5	57.0	-41.1	(-42.0)	108.3	(227)	33.9	1.3900
60.0	57.8	64.9	62.6	-48.3	(-54.9)	110.0	(230)	36.6	1.3952
65.0	62.8	70.3	68.0	b	b	112.8	(235)	39.1	1.4003
70.0	68.3	75.8	73.9	b	b	116.7	(242)	41.7	1.4055
75.0	73.6	81.2	79.7	b	b	120.0	(248)	44.2	1.4107
80.0	78.9	86.6	85.4	-46.8	(-52.2)	123.9	(255)	46.6	1.4159
85.0	84.3	92.0	91.2	-36.9	(-34.5)	133.9	(273)	49.0	1.4208
90.0	89.7	97.4	97.1	-29.8	(-21.6)	140.6	(285)	51.2	1.4255
95.0	95.0	a	a	-19.4	(-3.0)	158.3	(317)	53.2	1.4300

†Typical properties, not to be construed as specifications.

††Degree Brix is a measure of the sugar concentration in a fluid and is important in fermentation and syrups applications. Although there is no sugar present in DOWTHERM heat transfer fluids, the glycol affects the refractive index of the fluid in a similar fashion.

[a]Ethylene glycol concentrations greater than 92% are not attainable with DOWTHERM 4000 fluid.

[b]Freezing points are below -50°C (-60°F).

NOTE: Generally for an extended margin of protection, you should select a temperature in this table that is at least 3°C (5°F) lower than the expected lowest ambient temperature. Inhibitor levels should be adjusted for solutions of less than 20% glycol. Contact Dow for information on specific cases or further assistance.

Saturation Properties of DOWTHERM 4000 Fluid at 30% Ethylene Glycol Concentration by Volume

Temperature °C	Temperature (°F)	Specific Heat kJ/(kg)(K)	Specific Heat (Btu/lb. °F)	Density kg/m³	Density (lb./ft.³)	Therm. Cond. W/mK	Therm. Cond. [Btu/hr. ft.² (°F/ft.)]	Viscosity mPa•s	Viscosity (cps)
-10	(14)	3.542	(0.847)	1067.26	(66.63)	0.4154	(0.2400)	6.1788	(6.18)
10	(50)	3.600	(0.860)	1058.99	(66.11)	0.4420	(0.2554)	2.9482	(2.95)
40	(104)	3.687	(0.881)	1044.22	(65.19)	0.4731	(0.2733)	1.3398	(1.34)
65	(149)	3.759	(0.898)	1029.74	(64.28)	0.4909	(0.2836)	0.8246	(0.82)
90	(194)	3.831	(0.916)	1013.29	(63.26)	0.5015	(0.2897)	0.5599	(0.56)
120	(248)	3.918	(0.936)	990.96	(61.86)	0.5044	(0.2915)	0.3846	(0.38)

Saturation Properties of DOWTHERM 4000 Fluid at 40% Ethylene Glycol Concentration by Volume

Temperature °C	Temperature (°F)	Specific Heat kJ/(kg)(K)	Specific Heat (Btu/lb. °F)	Density kg/m³	Density (lb./ft.³)	Therm. Cond. W/mK	Therm. Cond. [Btu/hr. ft.² (°F/ft.)]	Viscosity mPa•s	Viscosity (cps)
-20	(-4)	3.307	(0.790)	1089.06	(67.99)	0.3707	(0.2142)	15.7533	(15.75)
10	(50)	3.410	(0.815)	1075.90	(67.17)	0.4053	(0.2342)	4.0451	(4.05)
40	(104)	3.512	(0.839)	1059.95	(66.17)	0.4312	(0.2491)	1.7731	(1.7)
65	(149)	3.598	(0.860)	1044.52	(65.21)	0.4462	(0.2578)	1.0646	(1.06)
90	(194)	3.684	(0.880)	1027.16	(64.12)	0.4552	(0.2630)	0.7013	(0.70)
120	(248)	3.787	(0.905)	1003.77	(62.66)	0.4582	(0.2647)	0.4614	(0.46)

Saturation Properties of DOWTHERM 4000 Fluid at 50% Ethylene Glycol Concentration by Volume

Temperature °C	(°F)	Specific Heat kJ/(kg)(K) (Btu/lb. °F)		Density kg/m³ (lb./ft.³)		Therm. Cond. W/mK [Btu/hr. ft.² (°F/ft.)]		Viscosity mPa•s (cps)	
-30	(-22)	3.051	(0.729)	1109.98	(62.29)	0.3333	(0.1926)	43.9970	(44.0)
-20	(-4)	3.091	(0.739)	1105.84	(69.04)	0.3442	(0.1989)	22.0816	(22.08)
10	(50)	3.209	(0.767)	1091.59	(68.15)	0.3724	(0.2152)	5.5071	(5.51)
40	(104)	3.328	(0.795)	1074.61	(67.09)	0.3937	(0.2275)	2.2567	(2.26)
65	(149)	3.427	(0.819)	1058.37	(66.07)	0.4062	(0.2347)	1.2936	(1.29)
90	(194)	3.526	(0.843)	1040.23	(64.94)	0.4139	(0.2391)	0.8227	(0.82)
120	(248)	3.644	(0.871)	1015.96	(63.42)	0.4168	(0.2408)	0.5252	(0.53)

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