Technical Data Sheet

DOWFROST™ Heat Transfer Fluid

Product Type

Inhibited propylene glycol-based heat transfer fluid

Applications

- Secondary heating and cooling
- Freeze and burst protection of pipes
- Various deicing, defrosting, and dehumidifying

Recommended Use Temperature Range

-45°C (-50°F) to 120°C (250°F)

Description

DOWFROST™ Heat Transfer Fluid contains specially formulated packages of industrial inhibitors that help prevent corrosion. Because propylene glycol fluids have low acute oral toxicity, DOWFROST™ propylene glycol-based fluids are often used in applications where contact with food or beverage products could occur.

Typical Properties[1]

Composition (% by weight)	
Propylene Glycol	96
Performance Additives	4
Color	Colorless
Specific Gravity 15/15°C (60/60°F)	1.050–1.060
pH of Solution (50% Glycol)	9.0–10.0
Reserve Alkalinity (min.)	10.0 ml

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

Typical Concentrations of DOWFROST™ Heat Transfer Fluid Required to Provide Freeze and Burst Protection at Various Temperatures

Temperature		Percent DOWFROST™ Heat Transfer Fluid Concentration Required	
°C	(°F)	For Freeze Protection Volume %	For Burst Protection Volume %
-7	(20)	18.8	12.6
-12	(10)	30.4	20.9
-18	(0)	37.7	25.1
-23	(-10)	44.0	29.3
-29	(-20)	48.2	31.4
-34	(-30)	52.4	34.6
-40	(-40)	56.5	36.6
-46	(-50)	59.7	36.6
-51	(-60)	62.8	36.6

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 30% glycol. Contact Dow for information on specific cases or further assistance.
Attention: These are typical numbers only and are not to be regarded as specifications. As use conditions are not within its control, Dow does not guarantee results from use of the information or products herein; and gives no warranty, express or implied.

Typical Freezing and Boiling Points of DOWFROST™ Heat Transfer Fluid[1]

Wt. % Propylene Glycol	Vol. % Propylene Glycol	Wt. % DOWFROST™ Heat Transfer Fluid	Vol. % DOWFROST™ Heat Transfer Fluid	Freezing Point		Boiling Point °C @ 101 kPa (°F @ 760 mmHG)		Degree Brix[2]	Refractive Index 22°C (72°F)
				°C	(°F)				
0.0	0.0	0.0	0.0	0	(32.0)	100.0	(212)	0.0	1.3328
5.0	4.8	5.2	5.2	-1.6	(29.1)	100.0	(212)	4.8	1.3383
10.0	9.6	10.5	10.0	-3.3	(26.1)	100.0	(212)	8.4	1.3438
15.0	14.5	15.7	15.1	-5.1	(22.9)	100.0	(212)	12.9	1.3495
20.0	19.4	20.9	20.3	-7.1	(19.2)	100.6	(213)	15.4	1.3555
25.0	24.4	26.1	25.5	-9.6	(14.7)	101.1	(214)	19.0	1.3615
30.0	29.4	31.4	30.7	-12.7	(9.2)	102.2	(216)	22.0	1.3675
35.0	34.4	36.6	36.0	-16.4	(2.4)	102.8	(217)	26.1	1.3733

1. Typical properties, not to be construed as specifications.
2. 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 DOWFROST™ heat transfer fluids, the glycol affects the refractive index of the fluid in a similar fashion.

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 30% glycol. Contact Dow for information on specific cases or further assistance.

Typical Freezing and Boiling Points of DOWFROST™ Heat Transfer Fluid (Cont.)

Wt. % Propylene Glycol	Vol. % Propylene Glycol	Wt. % DOWFROST™ Heat Transfer Fluid	Vol. % DOWFROST™ Heat Transfer Fluid	Freezing Point		Boiling Point °C @ 101 kPa (°F @ 760 mmHG)		Degree Brix	Refractive Index 22°C (72°F)
				°C	(°F)				
40.0	39.6	41.8	41.4	-21.1	(-6.0)	103.9	(219)	29.1	1.3790
45.0	44.7	47.0	46.7	-26.7	(-16.1)	104.4	(220)	31.8	1.3847
50.0	49.9	52.3	52.2	-33.5	(-28.3)	105.6	(222)	34.7	1.3903
55.0	55.0	57.5	57.5	-41.6	(-42.8)	106.1	(223)	38.0	1.3956
60.0	60.0	62.7	62.7	-51.1	(-59.9)	107.2	(225)	40.6	1.4008
65.0	65.0	68.0	68.0	a	a	108.3	(227)	42.1	1.4058
70.0	70.0	73.2	73.2	a	a	110.0	(230)	44.1	1.4104
75.0	75.0	78.4	78.4	a	a	113.9	(237)	46.1	1.4150
80.0	80.0	83.6	83.6	a	a	118.3	(245)	48.0	1.4193
85.0	85.0	88.9	88.9	a	a	125.0	(257)	50.0	1.4235
90.0	90.0	94.1	94.1	a	a	132.2	(270)	51.4	1.4275
95.0	95.0	99.3	99.3	a	a	154.4	(310)	52.8	1.4315

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

Saturation Properties of DOWFROST™ Heat Transfer Fluid at 30% Propylene Glycol Concentration by Volume

Temperature		Specific Heat		Density		Therm. Cond.		Viscosity	
°C	(°F)	kJ/(kg)(K) (Btu/lb. °F)		kg/m^3 ($lb./ft.^3$)		W/mK [Btu/hr. $ft.^2$ (°F/ft.)]		mPa•s (cps)	
-10	(50)	3.821	(0.913)	1033.71	(65.75)	0.4344	(0.2510)	4.5068	(4.51)
40	(104)	3.903	(0.933)	1019.56	(63.65)	0.4622	(0.2670)	1.6295	(1.63)
65	(149)	3.972	(0.949)	1004.26	(62.69)	0.4771	(0.2757)	0.9144	(0.91)
90	(194)	4.041	(0.966)	985.77	(61.54)	0.4846	(0.2800)	0.6040	(0.60)
120	(248)	4.123	(0.985)	959.35	(59.89)	0.4838	(0.2795)	0.4246	(0.42)

Saturation Properties of DOWFROST™ Heat Transfer Fluid at 40% Propylene Glycol Concentration by Volume

Temperature		Specific Heat		Density		Therm. Cond.		Viscosity	
°C	(°F)	kJ/(kg)(K) (Btu/lb. °F)		kg/m³ (lb./ft.³)		W/mK [Btu/hr. ft.² (°F/ft.)]		mPa•s (cps)	
-20	(-4)	3.569	(0.853)	1053.16	(65.75)	0.3635	(0.2100)	48.9043	(48.90)
10	(50)	3.668	(0.877)	1042.14	(65.06)	0.3936	(0.2274)	7.2173	(7.22)
40	(104)	3.768	(0.900)	1026.49	(64.08)	0.4150	(0.2398)	2.2389	(2.24)
65	(149)	3.850	(0.920)	1009.90	(63.05)	0.4262	(0.2463)	1.1762	(1.18)
90	(194)	3.933	(0.940)	990.10	(61.81)	0.4313	(0.2492)	0.7462	(0.75)
120	(248)	4.032	(0.964)	962.08	(60.06)	0.4294	(0.2481)	0.5084	(0.51)

Saturation Properties of DOWFROST™ Heat Transfer Fluid at 50% Propylene Glycol Concentration by Volume

Temperature		Specific Heat		Density		Therm. Cond.		Viscosity	
°C	(°F)	kJ/(kg)(K) (Btu/lb. °F)		kg/m³ (lb./ft.³)		W/mK [Btu/hr. ft.² (°F/ft.)]		mPa•s (cps)	
-30	(-22)	3.339	(0.768)	1064.83	(66.48)	0.3246	(0.1875)	172.8273	(172.83)
-20	(-4)	3.378	(0.807)	1061.71	(66.28)	0.3336	(0.1927)	73.0193	(73.02)
10	(50)	3.493	(0.835)	1049.25	(65.50)	0.3560	(0.2057)	10.6481	(10.65)
40	(104)	3.609	(0.863)	1032.17	(64.44)	0.3716	(0.2147)	3.1103	(3.11)
65	(149)	3.706	(0.886)	1014.40	(63.33)	0.3792	(0.2191)	1.5483	(1.55)
90	(194)	3.802	(0.909)	993.42	(62.02)	0.3821	(0.2208)	0.9339	(0.93)
120	(248)	3.918	(0.936)	964.00	(60.18)	0.3792	(0.2191)	0.6029	(0.60)

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