



## 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<sup>1</sup>

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<sup>1</sup>

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 <sup>2</sup>	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		Degree Brix	Refractive Index 22°C (72°F)
				°C	(°F)	°C @ 101 kPa (°F @ 760 mmHG)			
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

<sup>a</sup>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 <sup>3</sup> (lb./ft. <sup>3</sup> )		W/mK [Btu/hr. ft. <sup>2</sup> (°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/m <sup>3</sup> (lb./ft. <sup>3</sup> )		W/mK [Btu/hr. ft. <sup>2</sup> (°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/m <sup>3</sup> (lb./ft. <sup>3</sup> )		W/mK [Btu/hr. ft. <sup>2</sup> (°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)

### Product Stewardship

The Dow Chemical Company and its subsidiaries (“Dow”) has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our Product Stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

### Safety Considerations

Material Safety Data (MSD) sheets are available from The Dow Chemical Company. MSD sheets are provided to help customers satisfy their own handling, safety and disposal needs and those that may be required by locally applicable health and safety regulations. MSD sheets are updated regularly, therefore, please request and review the most current MSD sheet before handling or using any product. These are available from the nearest Dow sales office.

## Customer Notice

Dow encourages its customers to review their application of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they were not intended or tested, Dow personnel will assist customers in dealing with ecological and products safety. Your Dow sales representative can arrange the proper contacts.

### Contact:

For more information about this product please call The Dow Chemical Company.

North America: +1 (800) 447-4369  
Latin America: +55 (115) 184-8722  
Europe: +3 (111) 567-2626  
Asia/Pacific: +6 (037) 965-5392  
[www.dow.com](http://www.dow.com)

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

