



# DOWFROST

## Inhibited Propylene Glycol-based Heat Transfer Fluid

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.

**Recommended use temperature range:** -45°C (-50°F) to 120°C (250°F)

**Suitable applications:** secondary cooling and heating, freeze and burst protection of pipes, various deicing, defrosting, and dehumidifying.

For health and safety information for this product, contact your Dow sales representative or call the number for your area on the second page of this sheet for a Material Safety Data Sheet (MSDS).

### Typical Concentrations of DOWFROST Fluid Required to Provide Freeze and Burst Protection at Various Temperatures

| Temperature<br>°C (°F) | Percent DOWFROST Fluid<br>Concentration Required |                                  |
|------------------------|--|----------------------------------|
|                        | For Freeze Protection<br>Volume %                | For Burst Protection<br>Volume % |
| -7 (20)                | 18   | 12                               |
| -12 (10)               | 29   | 20                               |
| -18 (0)                | 36   | 24                               |
| -23 (-10)              | 42   | 28                               |
| -29 (-20)              | 46   | 30                               |
| -34 (-30)              | 50   | 33                               |
| -40 (-40)              | 54   | 35                               |
| -46 (-50)              | 57   | 35                               |
| -51 (-60)              | 60   | 35                               |

**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 Fluid†

| Wt. %<br>Propylene<br>Glycol | Vol. %<br>Propylene<br>Glycol | Wt. %<br>DOWFROST | Vol. %<br>DOWFROST | Freezing<br>Point<br>°C (°F) | Boiling Point<br>°C @ 101 kPa<br>(°F @ 760 mmHg) | Degree<br>Brix†† | Refractive<br>Index<br>22°C (72°F) |
|------------------------------|-------------------------------|-------------------|--------------------|------------------------------|--|------------------|------------------------------------|
| 0.0                          | 0.0                           | 0.0               | 0.0                | 0 (32.0)                     | 100.0 (212)                                      | 0.0              | 1.3328                             |
| 5.0                          | 4.8                           | 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                             |
| 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                            | 108.3 (227)                                      | 42.1             | 1.4058                             |
| 70.0                         | 70.0                          | 73.2              | 73.2               | a                            | 110.0 (230)                                      | 44.1             | 1.4104                             |
| 75.0                         | 75.0                          | 78.4              | 78.4               | a                            | 113.9 (237)                                      | 46.1             | 1.4150                             |
| 80.0                         | 80.0                          | 83.6              | 83.6               | a                            | 118.3 (245)                                      | 48.0             | 1.4193                             |
| 85.0                         | 85.0                          | 88.9              | 88.9               | a                            | 125.0 (257)                                      | 50.0             | 1.4235                             |
| 90.0                         | 90.0                          | 94.1              | 94.1               | a                            | 132.2 (270)                                      | 51.4             | 1.4275                             |
| 95.0                         | 95.0                          | 99.3              | 99.3               | a                            | 154.4 (310)                                      | 52.8             | 1.4315                             |

† 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 DOWFROST heat transfer fluids, the glycol affects the refractive index of the fluid in a similar fashion.

<sup>a</sup> 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 30% glycol. Contact Dow for information on specific cases or further assistance.

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## Inhibited Propylene Glycol-based Heat Transfer Fluid

### Typical Properties of DOWFROST Fluid†

| DOWFROST Heat Transfer Fluid |             |
|------------------------------|-------------|
| 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     |

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

### Saturation Properties of DOWFROST Fluid at 30% Propylene Glycol Concentration by Volume

| Temp.<br>°C (°F) | Specific Heat<br>kJ/(kg)(K)<br>(Btu/lb°F) | Density<br>kg/m <sup>3</sup><br>(lb/ft <sup>3</sup> ) | Therm. Cond.<br>W/mK<br>[Btu/hr ft <sup>2</sup> (°F/ft)] | Viscosity<br>mPa·s<br>(cps) |
|------------------|---|---|--|-----------------------------|
| 10 (50)          | 3.821 (0.913)                             | 1033.71 (64.53)                                       | 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 Fluid at 40% Propylene Glycol Concentration by Volume

| Temp.<br>°C (°F) | Specific Heat<br>kJ/(kg)(K)<br>(Btu/lb°F) | Density<br>kg/m <sup>3</sup><br>(lb/ft <sup>3</sup> ) | Therm. Cond.<br>W/mK<br>[Btu/hr ft <sup>2</sup> (°F/ft)] | Viscosity<br>mPa·s<br>(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 Fluid at 50% Propylene Glycol Concentration by Volume

| Temp.<br>°C (°F) | Specific Heat<br>kJ/(kg)(K)<br>(Btu/lb°F) | Density<br>kg/m <sup>3</sup><br>(lb/ft <sup>3</sup> ) | Therm. Cond.<br>W/mK<br>[Btu/hr ft <sup>2</sup> (°F/ft)] | Viscosity<br>mPa·s<br>(cps) |
|------------------|---|---|--|-----------------------------|
| -30 (-22)        | 3.339 (0.798)                             | 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)               |

***For further information, call...***

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