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Technical Data Sheet

DOWTHERM SR-1 Ethylene Glycol

Product: Dowtherm SR-1 Heat Transfer Fluid

Material Safety Data Sheet #: 40647

Manufacturer: The Dow Chemical Company



24 Hour Emergency Phone: 989-636-4400



DOWTHERM SR-1

Inhibited Ethylene Glycol-based Heat Transfer Fluid

DOWTHERM* SR-1 heat transfer fluid is a formulation of 95.5 weight percent ethylene glycol and a specially designed package of industrial corrosion inhibitors. The fluid is dyed fluorescent pink for leak detection purposes. Solutions in water provide freeze protection to below -50°C (-60°F) and burst protection to below -73°C (-100°F).

Recommended use temperature range: -50°C (-60°F) to 120°C (250°F).

Suitable applications: closed-loop, water-based HVAC, process heating and cooling, food industry applications within temperature range

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 DOWTHERM SR-1 Fluid Required to Provide Freeze and Burst Protection at Various Temperatures

| Temperature °C (°F) | Percent DOWTHERM SR-1 Fluid Concentration Required | |
|------------------------|--|----------------------------------|
| | For Freeze Protection Volume % | For Burst Protection Volume % |
| -7 (20) | 16.8 | 11.5 |
| -12 (10) | 26.2 | 17.8 |
| -18 (0) | 34.6 | 23.1 |
| -23 (-10) | 40.9 | 27.3 |
| -29 (-20) | 46.1 | 31.4 |
| -34 (-30) | 50.3 | 31.4 |
| -40 (-40) | 54.5 | 31.4 |
| -46 (-50) | 58.7 | 31.4 |
| -51 (-60) | 62.9 | 31.4 |

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 DOWTHERM SR-1 Fluid†

| Wt. % Ethylene Glycol | Vol. % Ethylene Glycol | Wt. % DOWTHERM SR-1 | Vol. % DOWTHERM SR-1 | Freezing Point °C (°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 | 5.2 | 4.6 | -1.4 (29.4) | 100.6 (213) | 3.8 | 1.3378 |
| 10.0 | 8.9 | 10.5 | 9.3 | -3.2 (26.2) | 101.1 (214) | 6.8 | 1.3428 |
| 15.0 | 13.6 | 15.7 | 14.2 | -5.4 (22.2) | 101.7 (215) | 9.9 | 1.3478 |
| 20.0 | 18.1 | 20.9 | 19.0 | -7.8 (17.9) | 102.2 (216) | 13.0 | 1.3530 |
| 25.0 | 22.9 | 26.2 | 24.0 | -10.7 (12.7) | 103.3 (218) | 16.1 | 1.3582 |
| 30.0 | 27.7 | 31.4 | 29.0 | -14.1 (6.7) | 104.4 (220) | 19.2 | 1.3635 |
| 35.0 | 32.6 | 36.6 | 34.1 | -17.9 (-0.2) | 105.0 (221) | 22.3 | 1.3688 |
| 40.0 | 37.5 | 41.9 | 39.3 | -22.3 (-8.1) | 105.6 (222) | 25.3 | 1.3741 |
| 45.0 | 42.5 | 47.1 | 44.5 | -27.5 (-17.5) | 106.7 (224) | 28.3 | 1.3796 |
| 50.0 | 47.6 | 52.4 | 49.8 | -33.8 (-28.9) | 107.2 (225) | 31.2 | 1.3849 |
| 55.0 | 52.7 | 57.6 | 55.2 | -41.1 (-42.0) | 108.3 (227) | 33.9 | 1.3900 |
| 60.0 | 57.8 | 62.8 | 60.5 | -48.3 (-54.9) | 110.0 (230) | 36.6 | 1.3952 |
| 65.0 | 62.8 | 68.0 | 65.8 | a | 112.8 (235) | 39.1 | 1.4003 |
| 70.0 | 68.3 | 73.3 | 71.5 | a | 116.7 (242) | 41.7 | 1.4055 |
| 75.0 | 73.6 | 78.5 | 77.1 | a | 120.0 (248) | 44.2 | 1.4107 |
| 80.0 | 78.9 | 83.8 | 82.6 | -46.8 (-52.2) | 123.9 (255) | 46.6 | 1.4159 |
| 85.0 | 84.3 | 89.0 | 88.3 | -36.9 (-34.5) | 133.9 (273) | 49.0 | 1.4208 |
| 90.0 | 89.7 | 94.2 | 93.9 | -29.8 (-21.6) | 140.6 (285) | 51.2 | 1.4255 |
| 95.0 | 95.0 | 99.5 | 99.5 | -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 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.

DOWTHERM SR-1

Inhibited Ethylene Glycol-based Heat Transfer Fluid

Typical Properties[†] of DOWTHERM SR-1 Fluid

| DOWTHERM SR-1 Heat Transfer Fluid | |
|-----------------------------------|------------------|
| Composition (% by weight) | |
| Ethylene Glycol | 95.5 |
| Performance Additives | 4.5 |
| Color | Fluorescent Pink |
| Specific Gravity | |
| 25/25° (77/77°F) | 1.1250–1.1350 |
| pH of Solution | |
| (50% glycol) | 9.0–10.5 |
| Reserve Alkalinity (min.) | 12.0 ml |

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

Saturation Properties of DOWTHERM SR-1 Fluid at 30% Ethylene Glycol Concentration by Volume

| Temp. °C (°F) | Specific Heat kJ/(kg)(K) (Btu/lb°F) | Density kg/m ³ (lb/ft ³) | Therm. Cond. W/mK [Btu/hr ft ² (°F/ft)] | Viscosity mPa·s (cps) |
|------------------|---|---|--|-----------------------------|
| -10 (14) | 3.562 (0.851) | 1055.47 (65.89) | 0.4154 (0.2400) | 6.1788 (6.18) |
| 10 (50) | 3.619 (0.865) | 1049.91 (65.54) | 0.4420 (0.2554) | 2.9482 (2.95) |
| 40 (104) | 3.704 (0.885) | 1037.92 (64.80) | 0.4731 (0.2733) | 1.3398 (1.34) |
| 65 (149) | 3.775 (0.902) | 1024.59 (63.96) | 0.4909 (0.2836) | 0.8246 (0.82) |
| 90 (194) | 3.846 (0.919) | 1008.20 (62.94) | 0.5015 (0.2897) | 0.5599 (0.56) |
| 120 (248) | 3.931 (0.939) | 984.53 (61.46) | 0.5044 (0.2915) | 0.3846 (0.38) |

Saturation Properties of DOWTHERM SR-1 Fluid at 40% Ethylene Glycol Concentration by Volume

| Temp. °C (°F) | Specific Heat kJ/(kg)(K) (Btu/lb°F) | Density kg/m ³ (lb/ft ³) | Therm. Cond. W/mK [Btu/hr ft ² (°F/ft)] | Viscosity mPa·s (cps) |
|------------------|---|---|--|-----------------------------|
| -20 (-4) | 3.336 (0.797) | 1073.23 (67.00) | 0.3707 (0.2142) | 15.7533 (15.75) |
| 10 (50) | 3.436 (0.821) | 1064.73 (66.47) | 0.4053 (0.2342) | 4.0451 (4.05) |
| 40 (104) | 3.537 (0.845) | 1051.85 (65.66) | 0.4312 (0.2491) | 1.7731 (1.77) |
| 65 (149) | 3.621 (0.865) | 1037.76 (64.79) | 0.4462 (0.2578) | 1.0646 (1.06) |
| 90 (194) | 3.705 (0.885) | 1020.63 (63.72) | 0.4552 (0.2630) | 0.7013 (0.70) |
| 120 (248) | 3.805 (0.909) | 996.06 (62.18) | 0.4582 (0.2647) | 0.4614 (0.46) |

Saturation Properties of DOWTHERM SR-1 Fluid at 50% Ethylene Glycol Concentration by Volume

| Temp. °C (°F) | Specific Heat kJ/(kg)(K) (Btu/lb°F) | Density kg/m ³ (lb/ft ³) | Therm. Cond. W/mK [Btu/hr ft ² (°F/ft)] | Viscosity mPa·s (cps) |
|------------------|---|---|--|-----------------------------|
| -30 (-22) | 3.090 (0.739) | 1090.31 (68.07) | 0.3333 (0.1926) | 43.9970 (44.00) |
| -20 (-4) | 3.129 (0.748) | 1088.15 (67.93) | 0.3442 (0.1989) | 22.0816 (22.08) |
| 10 (50) | 3.245 (0.776) | 1078.72 (67.34) | 0.3724 (0.2152) | 5.5071 (5.51) |
| 40 (104) | 3.361 (0.803) | 1064.91 (66.48) | 0.3937 (0.2275) | 2.2567 (2.26) |
| 65 (149) | 3.457 (0.826) | 1050.05 (65.55) | 0.4062 (0.2347) | 1.2936 (1.29) |
| 90 (194) | 3.554 (0.849) | 1032.15 (64.44) | 0.4139 (0.2391) | 0.8227 (0.82) |
| 120 (248) | 3.670 (0.877) | 1006.66 (62.84) | 0.4168 (0.2408) | 0.5252 (0.53) |

For further information, call...

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