



DOWTHERM SR-1

HEAT TRANSFER FLUID

Engineering Specifications for Closed-Loop HVAC Systems

MANUFACTURER

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GENERAL PRODUCT DESCRIPTION

DOWTHERM[®] SR-1 industrially inhibited ethylene glycol-based heat transfer fluid is manufactured by The Dow Chemical Company. Aqueous solutions of DOWTHERM SR-1 fluid are designed to provide freeze/burst and corrosion protection, as well as efficient heat transfer, in water-based, closed-loop heating and air-conditioning systems.

DOWTHERM SR-1 fluid has an operating temperature range of -60°F to 250°F; with fluid freeze protection to below -60°F, and system burst protection to below -100°F. The fluid contains corrosion inhibitors that are specially formulated for HVAC systems to keep pipes free of corrosion without fouling. DOWTHERM SR-1 fluid can be specified for use in new HVAC systems, or as a replacement fluid for use in existing systems. The fluid is dyed fluorescent pink to facilitate system leak detection.

DOWTHERM SR-1 fluid is also suitable for ice storage systems — used either in the closed circulation loop from the chiller to the storage medium; or, in solution with water, in the medium itself.

Since DOWTHERM SR-1 contains ethylene glycol which is harmful or fatal if swallowed, direct contact with food or drinking water should be avoided.

HVAC SYSTEM FLUID SPECIFICATION Closed-loop, water-based systems

1. FLUID MATERIAL

The ethylene glycol fluid to be used in such a system must meet the following requirements:

- 1.1 The fluid must be an industrially inhibited ethylene glycol (phosphate-based). Specifically excluded are automotive antifreezes or any formulations containing silicates.
- 1.2 The fluid must be dyed [fluorescent pink] to facilitate leak detection.
- 1.3 The fluid must be easily analyzed for glycol concentration and inhibitor level, and easily reinhibited using replacement inhibitor readily available from the fluid manufacturer.

- 1.4 For a system containing more than 250 gallons of fluid, annual analysis must be provided free of charge by the fluid manufacturer. Manufacturer must also provide testing guidelines for use by the operator of a smaller system.
- 1.5 The fluid must pass ASTM D1384 (less than 0.5 mils penetration per year for all system metals).

2. FLUID INSTALLATION

Follow these installation procedures:

- 2.1 Clean new or lightly corroded existing systems with a 1% to 2% solution of trisodium phosphate in water prior to the installation of industrially inhibited ethylene glycol fluid.
- 2.2 Extensively corroded existing systems should be cleaned by an industrial cleaning company and all necessary replacements and repairs should be made.
- 2.3 **Use only good quality water in solution with the ethylene glycol fluid. Use water with low levels (less than 25 ppm) of chloride and sulfate, and less than 50 ppm of hard water ions (Ca⁺⁺, Mg⁺⁺). Distilled or deionized water is recommended.** If good quality water is unavailable, purchase pre-diluted solutions of industrially inhibited ethylene glycol fluid from the fluid manufacturer or, if available, from the distributor.

3. SYSTEM DESIGN CONSIDERATIONS

- 3.1 Avoid use of automatic water make-up systems to prevent undetected dilution of the ethylene glycol and possible contamination of the water system.
- 3.2 Install industrially inhibited *propylene* glycol fluid if local plumbing codes require, or if contact with potable water is possible. See HVAC system engineering specifications sheet for DOWFROST[®] heat transfer fluid (Form No. 180-01272-893 QRP).

4. TECHNICAL DATA

4.1 DOWTHERM SR-1 Fluid, Product Description

Composition, % by weight

Glycols	95.4
Inhibitors and water	4.6
Color	Fluorescent Pink
Specific gravity at 60/60°F	1.1250 - 1.1350
pH of solution containing 50% glycol	9.0 - 9.6
Reserve alkalinity, minimum	11.0 ml

4.2 Typical Properties of Aqueous Solutions[†]

Physical Property	Temp. °F	25% Glycol Solution	30% Glycol Solution	40% Glycol Solution	50% Glycol Solution	60% Glycol Solution
Thermal Conductivity	40	0.262	0.251	0.231	0.212	0.196
	180	0.303	0.288	0.262	0.238	0.217
	250	0.306	0.291	0.265	0.241	0.220
Specific Heat, Btu/(lb•°F)	40	0.882	0.861	0.816	0.770	0.721
	180	0.930	0.913	0.879	0.842	0.812
	250	0.954	0.940	0.910	0.877	0.842
Viscosity, Centipoise	40	3.0	3.54	4.91	6.77	9.90
	180	0.57	0.63	1.79	0.94	1.06
	250	0.35	0.38	0.45	0.52	0.56
Density, (lb/ft ³)	40	65.17	65.66	66.59	67.47	68.31
	180	62.86	63.28	64.07	64.80	65.49
	250	61.02	61.40	62.12	62.78	63.39

[†]Typical properties, not to be construed as specifications.

4.3 Freezing and Boiling Points of Aqueous Solutions

Freezing Temperature, °F	% Glycol by Volume	Boiling Temperature, °F
26	10	214
16	20	216
10	25	218
4	30	220
-12	40	222
-34	50	225
-60	60	232
<-60	70	244
-49	80	258
-20	90	287

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