



# DOWTHERM™ 4000 Heat Transfer Fluid

## Engineering Specifications for Closed-Loop HVAC Systems

### Manufacturer

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### General Product Description

DOWTHERM™ 4000 industrially inhibited ethylene glycol-based heat transfer fluid is manufactured by The Dow Chemical Company. Aqueous solutions of DOWTHERM 4000 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 4000 fluid has an operating temperature range of -60°F to 350°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 4000 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 orange to facilitate system leak detection.

Compared to DOWTHERM SR-1 fluid, DOWTHERM 4000 fluid features a higher maximum operating temperature, higher reserve alkalinity and greater thermal stability for longer fluid service life. Extra-strength corrosion inhibitors in DOWTHERM 4000 fluid are formulated for high temperature use, resulting in reduced maintenance and longer inhibitor life in most applications.

Both DOWTHERM SR-1 and DOWTHERM 4000 contain 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 industrially inhibited ethylene glycol (phosphate-based). Specifically excluded are automotive antifreezes or any formulations containing silicates.

**1.2** The fluid must be dyed [fluorescent orange] to facilitate leak detection.

**1.3** The fluid must be easily analyzed for glycol concentration and inhibitor level.

**1.4** For a system containing more than 250 gallons of fluid, annual analysis must be provided free of charge by the fluid manufacturer.

**1.5** The fluid must pass ASTM D1384 (less than 0.5 mils penetration per year for all system metals).

**1.6** The reserve alkalinity of the fluid must be at least 25 to provide long-term resistance to acidic pH.

#### 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<sup>++</sup>, Mg<sup>++</sup>). 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 propylene 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 180-01272).

#### 4. Technical Data

##### 4.1 DOWFROST Fluid Product Description

Composition, % by weight	
Glycols	92.4
Inhibitors and water	7.6
Color	Fluorescent orange
Specific gravity at 60/60°F	1.130-1.144
pH of solution containing 50% glycol	8.5-9.0
Reserve alkalinity, minimum	25.0 ml

## 4.2 Typical Properties of Aqueous Solutions†

Physical Property	Temp. °F	30% Glycol Solution	40% Glycol Solution	50% Glycol Solution	60% Glycol Solution
Thermal Conductivity Btu/(hr. • ft. <sup>2</sup> )(°F/ft.)	40	0.251	0.231	0.212	0.196
	180	0.288	0.262	0.238	0.217
	350	0.278	0.254	0.233	0.214
Specific Heat Btu/(lb. • °F)	40	0.856	0.810	0.761	0.710
	180	0.910	0.874	0.835	0.793
	350	0.975	0.951	0.924	0.894
Viscosity, centipoise	40	3.54	4.91	6.77	9.90
	180	0.63	0.79	0.94	1.06
	350	0.23	0.25	0.27	0.29
Density (lb./ft. <sup>3</sup> )	40	66.27	67.33	68.32	69.24
	180	63.59	64.47	65.30	66.09
	350	58.75	59.43	60.10	60.75

†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
4	30	220
-12	40	222
-34	50	225
-60	60	232
<-60	70	244
-49	80	258
-20	90	287

**For more information, contact us at your convenience:**

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