TEC-FROST

TEC-FROST Heat Transfer Fluid. Technical Grade Propylene Glycol-Based Heat Transfer Fluid

Overview

TEC-FROST Heat Transfer Fluid is a specially-formulated heat transfer fluid that contains only food grade propylene glycol and food grade or USP di-potassium phosphate and food grade antifoam. All ingredients are classified as GRAS, or generally recognized as safe, by the FDA and acceptable as food additives (Food Additives Regulations, Subparts 182 and 184). It also meets Food Chemicals Codex (Fourth Edition). ***TEC-FROST Heat Transfer Fluid*** can be used in food processing applications in which incidental or accidental contact with food/beverage products or drinking water may occur.

TEC-FROST Heat Transfer Fluid contains an inhibitor package that helps prevent corrosion of metals, minimizes scaling and fouling of heat transfer surfaces, and buffers the pH to maintain it in the optimum operating range. The inhibitor system is based on a balanced high phosphate formulation. In terms of functionality and performance, ***TEC-FROST Heat Transfer Fluid*** is equivalent to the very best national brands on the market, including Dowfrost*, Ucarfreeze* and Jeffcool* P-200.

Relative to ethylene glycol, propylene glycol has a lower acute oral toxicity. Accordingly, propylene glycol based heat transfer fluids are at least preferable and often required in food processing industry applications in which they may make accidental contact with foods or beverages or where they may incidentally contaminate potable/drinking water. In some municipalities, the use of propylene glycol is required by law or regulation. The propylene glycol used in ***TEC-FROST Heat Transfer Fluid*** is industrial or heat transfer fluid grade; that used in ***TEC-FROST Heat Transfer Fluid*** is food or USP grade. For food industry applications in which the potential for food, beverage or drinking water exists., ***TEC-FROST Heat Transfer Fluid*** is usually the best choice. Propylene glycol also has a higher viscosity than ethylene glycol, which results in somewhat lower heat transfer efficiency and somewhat more difficult cold weather pump start-up for propylene-glycol-based fluids.

Applications

- HVAC system freeze/burst/corrosion protection
- Process cooling/heating
- Solar heating
- Refrigeration warehouse floor heating
- Thermal energy storage
- Ice skating rinks
- Sidewalk and playing field subsurface heating
- Cold room dehumidify
- Computer cooling systems
- Food and beverage processing
- Cosmetic or pharmaceutical buildings

Operating Temperature Range and Freeze/Burst Protection

TEC-FROST Heat Transfer Fluid has a recommended operating temperature range of -50ºF to +325ºF. The lowest temperature to which ***TEC-FROST Heat Transfer Fluid*** can be exposed depends upon the amount of water with which the concentrated product is mixed. ***TEC-FROST Heat Transfer Fluid*** can be used to provide both freezing protection and burst protection for systems which may be exposed to very low temperatures. The freezing point is the temperature at which ice crystals first begin to appear in the ***TEC-FROST Heat Transfer Fluid***. As the temperature continues to fall below this point, an ice/glycol slush forms until the temperature at which the solution freezes solid is reached. The latter is the burst point, or the point at which the expanded, frozen ***TEC-FROST Heat Transfer Fluid*** can cause piping, pumps, etc. to crack or rupture.

*Dowfrost and Ucarfreeze are trademarks of the Dow Chemical Co.; Jeffcool is a trademark of Hunstman Corp.

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Product Features

- Inhibitor system is phosphate-based
- Functional equivalent to Dowfrost, Ucarfreeze and Jeffcool P-200 and can be mixed with these products with no adverse effects.
- Operating range of -50ºF to +325ºF
- Unique additive package:
- Controls corrosion of metals
- Helps prevent scaling and fouling of heat transfer surfaces
- Buffers the pH to maintain it in the optimum operating range

Corrosion Protection

TEC-FROST Heat Transfer Fluid provides outstanding corrosion protection for copper, brass, solder, steel, and cast iron and aluminum. It meets or exceeds ASTM D 1384, the standard industry corrosion test for these metals. It is also completely compatible with most plastics, elastomers and types of rubber.

Water Quality Requirements

Water used to dilute ***TEC-FROST Heat Transfer Fluid*** can be low-hardness, city water or well water, although the use of deionized water or distilled water is best. It is recommended that water with no more than 350 ppm hardness be used to dilute ***TEC-FROST Heat Transfer Fluid*** concentrate or be used as make-up water.

Typical Properties

Physical Property	Temp (°F)	15% Glycol Solution	30% Glycol Solution	40% Glycol Solution	50% Glycol Solution	60% Glycol Solution
Thermal Conductivity [BTU/(hr ft3) (F°/ft)]	40	0.282	0.253	0.231	0.211	0.190
	180	.0327	0.285	0.255	0.228	0.199
	325	0.321	0.284	0.254	0.217	0.189
Specific Heat [(BTU/(lb °F)]	40	0.955	0.915	0.855	0.802	0.740
	180	0.989	0.967	0.924	0.886	0.839
	325	1.010	0.992	0.995	0.973	0.942
Viscosity, Centipoise	40	2.85	5.69	9.58	14.01	23.11
	180	0.49	0.62	0.81	1.00	1.21
	325	0.20	0.38	0.34	0.37	0.39
Density, (lb/ft3)	40	63.67	64.76	66.33	67.00	67.60
	180	61.36	62.01	62.91	63.79	64.11
	325	58.28	58.61	58.73	59.02	59.04

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Characteristics	Using Propylene Glycol
Composition (Cencentrate)	
Propylene Glycol	96.0 volume % max.
Inhibitors & Deionized water	4.0 volume % min.
Color	Distinctive
pH	
50% solution	9.8-10.8
30% solution	9.6-10.6
Specific Gravity (60°F)	
96% solution	1.045 min.
50% solution	1.020 min.
Reserve Alkalinity	
96% solution	10.0 ml. min.
50% solution	5.0 ml. min.
Flash Point Propylene Glycol	
96% solition	220°F min.
50% solution	none

Vol. % Propylene Glycol	Vol. % Tec-Frost	Freezing point °F	Boiling Point °F @ 760 mm Hg
15	15.6	22.7	213
30	31.2	8.4	216
40	41.6	-6.7	218
50	52.1	-28.6	222
60	62.5	-59.9	226

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