



Thermo-Wave™ P

Propylene Glycol-Based Heat Transfer Fluid Concentrate

Product Features

- Inhibitor system is phosphate-based
- Functional equivalent to the leading PG based products and can be mixed with them without adverse effects.
- Operating range of -50°F to +300°F
- 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



Overview

Thermo-Wave P™ is a specially formulated heat transfer fluid that contains propylene glycol, an inhibitor package including dipotassium phosphate, and antifoam.

Thermo-Wave P™ 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, **Thermo-Wave P™** is equivalent to the very best national brands on the market.

Relative to ethylene glycol, propylene glycol has a lower acute oral toxicity, but a lesser ability to transfer heat. Accordingly, propylene glycol based heat transfer fluids are preferable where they may incidentally contaminate potable/drinking water or there are other environmental concerns. In some municipalities, the use of propylene glycol is required by law or regulation. The propylene glycol used in **Thermo-Wave P™** is industrial or heat transfer fluid grade. 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 dehumidification
- Computer cooling systems

Thermo-Wave P should NOT be used in food processing applications in which incidental or accidental contact with food/beverage products or drinking water may occur. For food industry applications in which the potential for food, beverage or drinking water exists, please contact us for an equivalent food-grade product option.

Operating Temperature Range and Freeze/Burst Protection

Thermo-Wave P™ has a recommended operating temperature range of -50°F to +300°F. The lowest temperature to which **Thermo-Wave P™** can be exposed depends upon the amount of water with which the concentrated product is mixed. **Thermo-Wave P™** 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 **Thermo-Wave P™**. 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 **Thermo-Wave P™** can cause piping, pumps, etc. to crack or rupture.



Thermo-Wave™ P

Corrosion Protection

Thermo-Wave P™ provides outstanding corrosion protection for copper, brass, solder, steel, and cast iron and aluminum. It meets or exceeds ASTM D1384, 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 Thermo-Wave P™ 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 170 ppm hardness be used to dilute Thermo-Wave P™ 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·ft ³) (°F/ft)]	40	0.282	0.253	0.231	0.211	0.190
	180	0.327	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/ft ³)	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

Characteristics

Composition (Concentrate) Using Propylene Glycol

Propylene glycol 96.0 volume % max.
Inhibitors & deionized water 4.0 volume % min.
(minimum inhibitor is 2.0% v/v at any dilution)

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 15.0 ml. min.
50% solution 7.5 ml. min.

Flash Point Propylene Glycol
96% solution 220°F min.
50% solution none

Vol. % Propylene Glycol	Vol. % Thermo-Wave™ P	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

