

WEBA TECHNOLOGY

Heat Transfer Fluid Additive Packages

WEBA Technology has developed its own proprietary additive packages for glycol/water type heat transfer fluids covering the range of application requirements from light-duty heating and air conditioning systems to heavy-duty compressor engine cooling systems and chemical processing heat exchangers. All the WEBA METALGUARD heat transfer fluid additive packages blend readily with glycol and provide corrosion prevention, fluid longevity, and consistent finished product quality. These additive packages may be used with either ethylene or propylene glycol.

METALGUARD H80 is Formulated to meet the following Specification

- ASTM D 1384
- ASTM D 8039
- ASTM D 8040

This ASTM performance test includes all metals found in heat transfer fluid systems: steel, cast iron, aluminum, copper, brass and solder.

ASTM D1384 Results

As concentrated METALGUARD H80 heat transfer fluid:

Specimen	#1	#2	#3	Avr.	Max*
Copper	1	1	1	1	10
Solder	1	1	1	1	30
Brass	0	0	0	0	10
Steel	1	1	1	1	10
Cast Iron	0	0	0	0	10
Cast Alum.	8	2	1	4	30

*Maximum corrosion weight loss as specified by ASTM D3306

Technical Support

WEBA can answer questions about ASTM standards and industry specifications as well as help with many other questions relating to heat transfer fluids and glycols. To confirm that your finished product meets the required industry specifications, WEBA's technical staff can help you with problem solving and testing associated with any product containing our inhibitor package.

Quality Control

WEBA's additive packages must pass all our quality control tests prior to shipment. They are tested for conformance with product specifications and industry standards. Certificate of analysis are provided with every shipment. Complete ASTM performance tests are available by request.

METALGUARD® H80

Aluminum HVAC Heat Transfer Fluid Additive Package

Product Description and Applications

METALGUARD H80 is a heat transfer fluid additive package that is based on organic acid technology. It was designed for multi-metal systems and also systems made entirely or partly of aluminum. Traditional heat transfer fluids are usually phosphate-based (like fluids made with METALGUARD H50), exhibit relatively high pH levels and only protect aluminum at operating temperatures up to a maximum of 150°F (65°C). While these fluids provide good protection for most HVAC systems and other heating/cooling systems made primarily of steel with some copper, cast iron and brass, they can cause great damage to all-aluminum systems operating above 150°F, especially all-aluminum boiler systems.

METALGUARD H80's organic acid-based formulation contains no nitrites, amines, borates or phosphates and provides a pH of 8.0-9.0 in 50% heat transfer fluid. It protects all commonly used metals, including aluminum, up to at least 350°F (176°C), and it is compatible with most plastics and elastomers. Heat transfer fluids made with METALGUARD H80 can be used in any heating/cooling system but it is the best choice for high-aluminum-content systems operating above 150°F (65°C). The organic acid salts used in METALGUARD H80 coat all metal surfaces for protection from corrosion. Azoles are included to supplement "soft" metal protection (copper, brass, solder and aluminum). Organic acid depletion rates are very slow, resulting in a fluid life at least as long as phosphate-based fluids without the necessity of boosting the phosphate content periodically.

METALGUARD H80 may be used to inhibit ethylene glycol, propylene glycol or glycerine. A heat transfer fluid concentrate is made with 4% by volume of METALGUARD H80, based on the volume of glycol or glycerine being treated. This concentrate can be diluted with as much as 70% water. To ensure proper corrosion protection, dilutions with more than 70% water must contain the same percentage of METALGUARD H80 as a 70% dilution (30% heat transfer fluid concentrate). Dilution water should be deionized water. See page 2 for additional information on treat rates for various heat transfer fluid applications.

Typical Product Specifications

As concentrated METALGUARD H80 inhibitor package:

Visual	Clear to cloudy, light amber liquid	
Specific Gravity; 70°F/21°C	1.067-1.075	
pH	8.8-9.8	
As concentrated HTF	Ethylene Glycol	Propylene Glycol
Specific Gravity; 70°F	1.110-1.115	1.040-1.045
pH	8.0-9.0	8.0-9.0
Freeze Point @ 50%	-34°F (-36°C) max.	-28°F (-33°C) max.

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Blending & Use Instructions

For light- to medium-duty applications: concentrated heat transfer fluid should be made by thoroughly blending METALGUARD H80 into ethylene glycol, propylene glycol or glycerine in an amount equal to 4% (by volume) of the glycol being treated. This H80 concentrate should be used in stationary engine cooling systems, HVAC systems, etc. where constant circulation is present. The concentrate may be diluted down to a minimum of 30% by volume with 70% by volume deionized water. If heat transfer fluid concentrations of less than 30% are required, more METALGUARD H80 should be added, so as to maintain a minimum additive concentration no lower than that resulting from dilution of concentrated heat transfer fluid to 30%. Blending should be done with glycol/additive temperatures as low as 50 °F (10 °C). Antifoam is also required.

For heavy-duty applications: use rate is 5.0% by volume in concentrate and 2.25% in 50/50. Antifoam is required where constant circulation is present.

For static use applications: such as fire protection system, freeze/corrosion protection or RV antifreeze, H80 treat rate in glycol concentrate should be from 2.6% to 4.0% by volume. Lower H80 concentrations may be used in shorter term situations, or situations in which glycol losses may be high (as in some line heaters and dehydrators).

Antifoam: Add the appropriate amount of antifoam to allow your product to pass a foam test. For reclaimed glycol antifreeze concentrate use 1.5 gallons (5.68L) per 5000 gallons (18,925L) of antifreeze concentrate (0.75 gallons/2.84L in 50/50). More may be needed depending upon glycol-base quality. For virgin glycols use 1.0 gallons (3.79L) per 5000 gallons (18,925L) of antifreeze concentrate (0.5 gallons/1.89L in 50/50). Antifoam may be purchased in 5-gallon (18.93L) pails from WEBA Technology.

Water Quality and Dilution: Propylene or ethylene glycol-containing METALGUARD H80 may be diluted to levels to the 30-50% glycol range with deionized water. It is recommended that the water of dilution be deionized water, however low-hardness, city water or well water may be used. It is recommended that water with no more than 350 ppm hardness be used to dilute the concentrate or be used as make-up water. Higher hardness levels may cause excessive inhibitor consumption, scale deposits and metal pitting.

Storage: Store concentrated METALGUARD H80 additive package above of 60°F (15.5°C) at all times. Once a container is opened there is a possibility of the water base evaporating, so close the container tightly after each use. High temperatures, above 90°F (32°C), for an extended period of time may also cause degradation of the inhibitors. If you are in an area of the country with continuous high heat store the additive in a cooler area of your warehouse.

Quality Control Procedures: WEBA Technology strongly recommends that all antifreeze producers have an internal complete quality control program in place for manufacturing and testing of all products made for sale.

Fluid Maintenance: Heat Transfer Fluids made with METALGUARD H80 should be examined every 6-12 months. If at 6-months a visual observation reveals no color change, precipitate formation or phase separation and a pH check indicates that the parameter is in its proper range, no action is required. If fluid is out of range, then a booster using the H80 additive should be added to the system at the proper rate. See extended use instructions for more information.

Finished Fluid Typical Properties for Reference in Blending Finished Fluids

Typical Properties of Propylene Glycol Based Heat Transfer Fluids made with METALGUARD H80

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	0.265	0.253	0.234	0.215	0.199
	180	0.307	0.291	0.267	0.241	0.220
	250	0.310	0.293	0.269	0.245	0.224
Specific Heat [(BTU/(lb • °F)]	40	0.885	0.862	0.820	0.774	0.724
	180	0.933	0.915	0.883	0.849	0.816
	250	0.958	0.944	0.913	0.882	0.845
Viscosity, Centipoise	40	3.11	3.59	4.94	6.81	9.93
	180	0.59	0.66	1.82	0.96	1.09
	250	0.37	0.40	0.47	0.55	0.59
Density, (lb/ft3)	40	65.19	65.71	66.61	67.50	68.33
	180	62.90	63.31	64.10	64.83	65.55
	250	61.05	61.42	62.15	62.81	63.44

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Typical Properties of Propylene Glycol Based Heat Transfer Fluids made with METALGUARD H80, continued

Characteristics			Using EG/PG Glycol		Vol. % Ethylene Glycol	Vol. % Finished Product	Freezing Point °F	Boiling Point °F @760mmHg
Composition (Concentrate)								
Ethylene/Propylene glycol			96.0 volume % max.					
Inhibitors & deionized water			4.0 volume % min.					
pH								
50% solution			8.0-8.9		15	15.6	23.6	215
30% solution			7.8-8.5		30	31.2	3.7	220
					40	41.6	-2.7	223
					50	52.1	-34.6	226
					60	62.5	-60.0	228
Specific Gravity (60° F)			Ethylene Glycol	Propylene Glycol	Vol. % Propylene Glycol	Vol. % Finished Product	Freezing Point °F	Boiling Point °F @760mmHg
96% solution			1.110 min.	1.040 min.	15	15.6	22.7	213
50% solution			1.055 min.	1.015 min.	30	31.2	8.4	216
Flash Point			Ethylene Glycol	Propylene Glycol	40	41.6	-6.7	218
96% solution			240° F min.	220° F min.	50	52.1	-28.6	222
50% solution			none	none	60	62.5	-59.9	226

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