

WEBA TECHNOLOGY

Heat Transfer Fluid Additive Packages

WEBA Corp 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 Corp 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 H50 is Formulated to meet the following Specification

- ASTM D1384

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 H50 heat transfer fluid:

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

*Maximum corrosion weight loss as specified by ASTM D3306

Technical Support

WEBA Corp 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 Corp'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® H50

HVAC Heat Transfer Fluid Additive Package

Product Description and Applications

METALGUARD H50 Heat Transfer Fluid additive package is formulated for use with both ethylene or propylene glycols. METALGUARD H50 mixes readily with glycols at temperatures as low as 50°F (10°C). METALGUARD H50 may be used to make finished heat transfer fluids for closed-loop systems, water-based HVAC systems, process heating and cooling systems, and more.

The inhibitors in METALGUARD H50 protect all metals found in heat transfer fluid systems. These inhibitors control the corrosion of metals, help prevent scaling and fouling of heat transfer surfaces and buffer the pH to maintain it in the optimum operating range. The inhibitor system is based on a high-phosphate, multi-component formulation which makes METALGUARD H50 equivalent in terms of functionality and performance to the very best national brands available. The finished fluid has a recommended operating temperature range of -60°F to +350°F (-50°C to 120°C), and can be used to provide both freeze and burst protection for systems which may be exposed to very low temperatures.

METALGUARD H50 provides outstanding corrosion protection for copper, brass, solder, steel, and cast iron and aluminum. The finished fluids made with METALGUARD H50 meet or exceeds ASTM D1384, the standard industry corrosion test for these metals. It is compatible with most plastics, elastomers and types of rubber. Its corrosion protection system includes organic acid technology which coats iron, steel and aluminum metal surfaces to protect them from acidic attack and rust formation with a thin molecular coating that doesn't cause fouling or significantly reduce heat conduction through the metal heat transfer surfaces. METALGUARD H50 also contains tolyltriazoles to protect copper, brass and solder from attack and oxygen scavengers to provide further protection from rust and pitting. A very effective buffering system neutralizes acids formed by the normal thermal and oxidative degradation of glycols, thus maintaining the pH in its optimum range.

Finished fluids containing METALGUARD H50 may be formulated to any concentration. Water used to dilute the fluid can be low-hardness, city water or well water, although the use of deionized water is best. 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.

Typical Product Specifications

As concentrated METALGUARD inhibitor package:

Visual	Clear liquid
Specific Gravity	1.25-1.35
pH	10.0-11.0

As concentrated Heat Transfer Fluid:

	H50 in EG	H50 in PG
Specific Gravity	1.122-1.135	1.04-1.06
pH	9.5-10.8	9.5-10.8
Reserve Alkalinity	10 ml min.	10 ml min.
Freeze Point @ 50%	-34°F (-36°C) max.	-27°F (-33°C) max.

METALGUARD® H50

Heat Transfer Fluid Additive Package

Blending & Use Instructions

For heavy-duty applications such as use in cooling systems for large stationary engines, use a rate of at least 4% by volume (based on the quantity of glycol being treated) is recommended. METALGUARD H50 in ethylene glycol will provide inhibitor levels consistent with those given above as typical, and will provide outstanding coolant performance and equipment protection.

Follow the below mixing rates and be sure to mix glycol or glycol/water and additive until there is a uniform solution. Be sure the additive is entirely dissolved.

For heavy-duty (Dowtherm HD equivalent) use rate is 8.0% by volume in ethylene glycol. However, the pH of the finished fluid must be reduced, using phosphoric acid, to the proper range of 9.5-10.5.

For less demanding uses, shorter term applications or situations in which glycol losses may be high (as in certain line heaters and dehydrators) use rates from 2.6% to 4.0% often provide more than adequate protection from glycol oxidation and metal corrosion.

Water Quality and Dilution: Propylene or ethylene glycol-containing METALGUARD H50 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. Dilution water should contain no more than 350 ppm hardness as higher hardness levels may cause excessive inhibitor consumption, scale deposits and metal pitting.

Storage: Store concentrated METALGUARD H50 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 Corp 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. Visit the Customer Information Area at www.webacorp.com/customerarea.html for information on creating a basic quality control program for your company.

Fluid Maintenance: Heat Transfer Fluids made with METALGUARD H50 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. A full analysis of the fluid at 12 months is recommended.

Fishished Fluid Typical Properties for Reference in Blending Finished Fluids

Typical Properties of Propylene Glycol Based Heat Transfer Fluids made with METALGUARD H50

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

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		9.8-10.8		15	15.6	23.6	215
30% solution		9.6-10.6		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)							
96% solution		Ethylene Glycol	Propylene Glycol				
		1.125 min.	1.040 min.				
50% solution		1.070 min.	1.020 min.				
Reserve Alkalinity							
96% solution		10.0 ml. min.					
50% solution		5.0 ml. min.					
Flash Point							
96% solution		Ethylene Glycol	Propylene Glycol	15	15.6	22.7	213
		240° F min.	220° F min.	30	31.2	8.4	216
50% solution		none	none	40	41.6	-6.7	218
				50	52.1	-28.6	222
				60	62.5	-59.9	226

METALGUARD® H50

Heat Transfer Fluid additive package, Glycol Based Inhibitor Package

Making Claims for Heat Transfer Fluids Blended with WEBA Corp's Additive Packages

The specifications listed in this bulletin are based on heat transfer fluids produced with WEBA Corp's additive packages, virgin glycol and deionized water. Blenders must demonstrate independent compliance with ASTM or other specifications with their antifreeze/coolant, because the quality of the glycol and water used is as important as the additive package. Glycol quality specifications have been established. Obtain copies of the specifications that you wish to meet, thoroughly read them and conduct any required tests, prior to stating that your antifreeze produced meets the specifications. WEBA Corp can provide assistance locating the necessary specifications/standards. To confirm that your finished products meet the required industry specifications, WEBA Corp recommends that you test your glycol and finished products at an accredited laboratory. Glycol should be tested for conformance with ASTM E1177 and/or ASTM E7713, and finished products should be tested for the ASTM performance tests listed on this product bulletin. WEBA Corp can assist your company in preparing your samples for testing with pre-tests performed at the accredited laboratory. WEBA Corp will warrant our additive packages only if these procedures and the recommended blending and storage procedures are properly followed. In addition, the glycol or other base fluid used with our additive systems must meet industry or ASTM standards unless specifically exempted in our literature.

Technical Contact Information

WEBA Technology Corp.
1213 N. Sherman Ave. #351
Madison, WI 53704 USA
Tel: 608-819-8806
Fax: 608-237-2054
www.webacorp.com
info@webacorp.com

Version date: January 13, 2017
Supersedes: May 6, 2013
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