

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 H50 is Formulated to meet the following Specifications

- ASTM D8039
- ASTM D8040
- ASTM D1384

H50 was tested using both automotive and heat transfer fluid ASTM tests. The tests include all metals found in automotive and heat transfer fluid systems including: steel, cast iron, aluminum, copper, brass and solder. See page 3 for actual test results. Laboratory reports provided upon request.

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® 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. Finished fluids made with METALGUARD H50 meet or exceed industry standards when tested according to ASTM D1384 and D8040 methods. It is compatible with most plastics, elastomers and types of rubber. METALGUARD H50 also contains tolyltriazoles to protect copper, brass and solder. 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 170 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 50/50 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)

Shipping specifications:

In drums: NOT REGULATED, NMFC 50070, Sub 2, Class 60
In totes: NOT REGULATED, NMFC 50070, Class 60

METALGUARD® H50

Heat Transfer Fluid Additive Package

Blending & Use Instructions

Use Rates. Connect with your salesperson at WEBA Technology to determine the proper use rate

General HVAC applications: **4.0% by volume, with no less than 1.2% by volume in any dilution**

Premium Heavy-duty applications: **6.0% by volume, with no less than 1.8% by volume in any dilution**

Less Demanding applications: **2.6 to 4.0% by volume**

For heavy-duty applications use a rate of at least 4% up to 6% 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. 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.

Blending Instructions:

Charge the desired quantity of glycol to the blending tank. For glycol/water dilutions the additive is considered as part of the water percent. To achieve a proper freeze point you will need to adjust the mixture accordingly. Heat the glycol or water/glycol to 50°F (10°C) or higher. For reclaimed glycols adjust its pH range to a range of 7.0-9.0, as required. Maintain the minimum temperature throughout the blending procedure. Good agitation is vital to making a consistent and proper product; agitate for 30-60 minutes after the addition of the additive package. Add the antifoam (see below). For premium fluids using 6% by volume rate, the pH should be adjusted down to <10.5 pH using phosphoric acid. Contact WEBA for assistance with this procedure.

Antifoam: Add the appropriate amount of antifoam to allow your product to pass a foam test. BASF L61 is recommended for use with ethylene glycol-based fluids and BASF L62 antifoam for use with propylene glycol. You may also use another brand of antifoam as long as it is an equivalent product. Antifoams may be purchased in 5-gallon (18.93L) pails from WEBA.

L61 Treat Rate: For use in ethylene glycol base concentrate, use 0.01% by volume. For 50/50 coolant use 0.005% by volume. Use 0.5 gallon (1.90L) per 5000 gallons (18,925L) of antifreeze concentrate (0.25 gallons/0.95L in 50/50). Add the appropriate amount of antifoam to allow your product to pass a foam test. More may be needed depending upon glycol-base quality.

L62 Treat Rate: For use in propylene glycol base concentrate, use 0.02% by volume. For 50/50 coolant use 0.01% by volume. Use 1.0 gallon (3.8L) per 5000 gallons (18,925L) of antifreeze concentrate (0.5 gallons/1.9L in 50/50). Add the appropriate amount of antifoam to allow your product to pass a foam test. More may be needed depending upon glycol-base quality.

Dye: As the last step add the color of dye that you wish to use. If you need help determining dye colors or use rates you may contact us. We can help you to select the proper color for the antifreeze you wish to produce; or connect directly with Robert Koch Industries www.kochcolor.com, our preferred dye company.

Testing & Quality Control: Test your finished product to be sure it conforms to specifications. 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.

Storage: Store concentrated the additive package above of 60°F (15.5°C) at all times. If a container arrives very cold to your warehouse, place it in a hot room for 1-2 days then stir thoroughly prior to use. Once a container is opened there is a possibility of some evaporation of the water base, 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.

Water Quality and Dilution: When heat transfer fluid concentrate is diluted to 50% by volume with water, the water of dilution must be of acceptable quality. Deionized water is the best to use, but other sources of water are acceptable as long as they contain less than 170 ppm total hardness measured as calcium and magnesium compounds. Higher hardness levels may cause excessive inhibitor consumption, scale deposits and metal pitting.

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.

The specifications listed in this bulletin are based on antifreeze produced with WEBA's additive packages, virgin glycol and deionized water. To confirm that your finished products meet the required industry specifications, WEBA recommends that you test your glycol and finished products at an accredited laboratory. WEBA will warrant our additive packages only if this procedure and the recommended blending and storage procedures are properly followed and documented. In addition, the glycol or other base fluid used with our additive systems should meet industry or ASTM standards unless specifically exempted in our literature.

METALGUARD® H50

Heat Transfer Fluid additive package, Glycol Based Inhibitor Package

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 • ft ³) (°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/ft ³)	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	
Composition (Concentrate)			
Ethylene/Propylene glycol		96.0 volume % max.	
Inhibitors & deionized water		4.0 volume % min.	
pH			
50% solution		9.8-10.8	
30% solution		9.6-10.6	
Foam			
		Pass, 150mL rise <5 sec.	
Specific Gravity (60 °F)			
	Ethylene Glycol	Propylene Glycol	
96% solution	1.125 min.	1.040 min.	
50% solution	1.070 min.	1.020 min.	
Reserve Alkalinity			
		10.0 ml. min.	
96% solution		5.0 ml. min.	
50% solution			
Flash Point			
	Ethylene Glycol	Propylene Glycol	
96% solution	240 °F min.	220 °F min.	
50% solution	none	none	

Vol. % Ethylene Glycol	Vol. % Finished Product	Freezing Point °F	Boiling Point °F @760mmHg
15	15.6	23.6	215
30	31.2	3.7	220
40	41.6	-2.7	223
50	52.1	-34.6	226
60	62.5	-60.0	228

Vol. % Propylene Glycol	Vol. % Finished Product	Freezing Point °F	Boiling Point °F @760mmHg
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

ASTM D8040 Results

METALGUARD H50, 30% heat transfer fluid

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

Dilution to 30% concentration and Maximum corrosion weight loss are specified by ASTM D8039 method.

ASTM D1384 Results

METALGUARD H50, 50% 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 Contact Information

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