

METALGUARD® H50

HVAC Heat Transfer Fluid Additive Package

Overview

METALGUARD H50 Heat Transfer Fluid additive package is formulated for use with both ethylene glycol and propylene glycol. 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 optimal 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 -50°F to +300°F (-46°C to 149°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 using the to the ASTM D1384 and D8040 methods. It is compatible with most plastics, elastomers and types of rubber. METALGUARD H50 also contains tolyltriazole 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 optimal range.



Features & Benefits

- Contains anti-scalants and dispersants to prevent scaling and fouling of heat exchange surfaces.
- Can be blended with ethylene glycol, propylene glycol or glycerin bases.
- Provides both freeze and burst protection.
- Contains ingredients to protect all system metals.
- Compatible with most plastics, elastomers and types of rubber.
- Formulated to buffer pH when used with high quality glycols meeting ASTM E1177.



Industry Applications

Used to make finished fluids for:

- HVAC systems, closed-loop systems
- Process heating and cooling systems
- Pulp and paper processing plants
- High temperature plastic injection molding plants
- Asphalt melting operations
- Office buildings, apartments, schools, hospitals, hotels & resorts, and more.



Specifications

Formulated to meet:

- ASTM D8039
- ASTM D8040
- Tested using D1384 with limits well below those outlined in ASTM D3306.



Quality Control & Technical Support

WEBA's products must pass rigorous quality control tests. They are tested for conformance with product specifications and industry standards. Certificates of analysis are provided with every shipment. WEBA Technology can help with many technical questions relating to the finished fluids our additives create, types of glycol and other bases, and assist with issues on products containing our inhibitor packages.



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Product Specifications

As concentrated inhibitor package:

Visual	Clear to slightly cloudy, clear to amber liquid
Specific Gravity; 70°F/21°C	1.250-1.350
pH	10.0-11.0

As concentrated Heat Transfer Fluid

	Ethylene glycol base	Propylene glycol base
Specific Gravity; 70°F/21°C	1.110-1.145	1.040-1.060
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.	-34°F (-36°C) max.



Blending & Use Instructions

Blending: Upon opening the drum of additive, stir thoroughly. Do not use high speed agitation. If you use only a portion of the drum (i.e. a few gallons at a time) you need to mix the drum of additive prior to pulling out the required amount. If you use the entire drum to make a bulk blend you do not need to mix the drum prior to use.

To make heat transfer fluid concentrate: First charge the desired quantity of glycol to the blending tank. Heat the glycol to 50°F (10°C) or higher. 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.

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

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

Premium Heavy-duty applications: 5.3% by volume in concentrate with no less than 1.6% by volume in any dilution

Less Demanding applications: 2.6 to 4.0% by volume in concentrate.

Antifoam: For systems with circulation and pumps, add the appropriate amount of antifoam to allow your product to pass a foam test. Use 0.01% by volume or 0.5 gallon (1.90L) per 5000 gallons (18,925L) of heat transfer fluid concentrate (0.25 gallons/0.95L in 50/50). More may be needed depending upon glycol-base quality. Antifoam may be purchased in 5-gallon (18.93L) pails from WEBA.

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.

Testing: Test your finished product to be sure it conforms to specifications. See below paragraph on quality control.

Storage: Store concentrated additive packages above 60°F (15.5°C). If a container arrives cold to your warehouse, immediately place it in a hot room for 1-2 days then stir thoroughly prior to use. Alternatively, heating blankets may be used (follow local regulations regarding their usage) Once a container is opened there is a possibility of the liquid phase evaporating, so close the container tightly after each use. High temperatures, above 100°F (38°C) for an extended duration, 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 with water, the water for dilution must be of acceptable quality. Deionized water is the best to use, but other sources of water are acceptable if they meet the water quality limits outlined in ASTM D8039.

Quality Control Procedures: WEBA strongly recommends that all heat transfer fluid producers have an internal, complete quality control program in place for manufacturing and testing of all products made for sale. It is recommended that in-service heat transfer fluids be inspected every 3-6 months to detect any obvious contamination, phase separation, cloudiness, precipitation or significant pH change. WEBA recommends a full analysis of the fluid at least once a year or when monitored physical properties indicate a problem.

The specifications listed in this bulletin are based on products 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.



Typical Properties

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		9.9-10.9	
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			
96% solution		10.0 ml. min.	
50% solution		5.0 ml. min.	
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 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 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

Tested using D1384 with limits well below those outlined in ASTM D3306. Maximum corrosion weight loss as specified by ASTM D3306.