

Patent-Pending Formulation

GREENTEMP



Specially Formulated for Heat Transfer Applications

Product Applications, Specifications & Analysis

GreenTemp® HT is revolutionizing the heating and cooling industry with its versatility, superior qualities and the following key benefits:

- ✓ **Non-Toxic / Environmentally Friendly**
GreenTemp® HT is developed from a renewable source, is animal feed grade safe and biodegradable
- ✓ **Low Freezing Point**
As a concentrate, GreenTemp® HT can be mixed to offer each user freeze protection to as low -48°F
- ✓ **Retains Heat**
GreenTemp® HT retains heat 11-15% longer than water/glycol mixes providing additional efficiency for your heating system

What Makes GreenTemp® HT Different?



At its most basic, GreenTemp® HT is a heat transfer material and for routine requirements such as **heating and cooling homes, offices, industrial processes**, etc., it provides the necessary range of protection and high quality performance representing an environmentally friendly alternative.

Traditionally, many of our customers have used methanol or propylene or ethylene glycol mixed with water to prevent freezing for their specific applications. Each of these materials, in any concentration, is detrimental to the environment. In addition to being subject to shifting energy costs and EPA regulations that complicate application and disposal, methanol can be explosive under certain conditions and both formulations

of glycols can be very corrosive to fittings, gaskets, plastics, etc.

In heating applications, when seeking to maximize performance with minimal fuel costs, GreenTemp® HT **outperforms the glycols** because of those products natural tendency to act as coolants (e.g., a car radiator coolant). GreenTemp® HT has a more complex molecular structure than straight water so it **holds heat longer while still providing radiance and freeze protection**. In radiant heating systems, for example, holding heat longer means that the GreenTemp® HT fluid that is pumped back to the heat source (e.g., furnace) will be warmer and therefore it will take **less energy** (fuel) to bring the fluid back up to the desired circulating temperature.

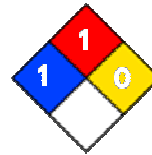
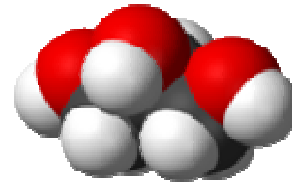
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Anti-Freeze Dilution Guide

GreenTemp® HT (%)	Water (%)	Freezing Point (°F)
0.0	100.0	32°
25.0	75.0	16.4°
33.3	67.0	7.2°
50.0	50.0	-22.4°
65.0	35.0	-45.4°
66.0	34.0	-48.5°



GreenTemp® HT

Concentration Analysis (Cations/Metals (mg/L))

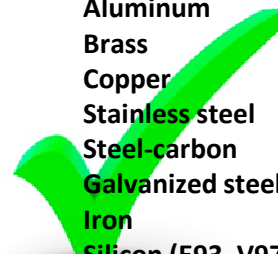
Aluminum	2.0
Barium	<0.04
Boron	<0.1
Cadmium	<0.04
Calcium	48
Chromium	<0.01
Copper	0.16
Iron	4.6
Lead	<0.2
Lithium	<0.01
Magnesium	4.5
Manganese	0.21
Molybdenum	<0.1
Nickel	<0.1
Phosphorus (P)	<1.1
Phosphorus (PO4)	<3.2
Potassium	6.3
Silica	11.0
Sodium	180
Strontium	0.13
Vanadium	<0.53
Zinc	0.07
Calcium	120
Magnesium	18.0
Sodium	390

GreenTemp® HT Concentrate Properties

Density	1.261 g/cm ³
Melting Point	64.4° F
Boiling Point	554° F
Viscosity	1.5 Pa·s
Pour Point (40/60 mix)	-11.2° F
Pour Point (50/50 mix)	-11.2° F
Pour Point (60/40 mix)	-22° F

GreenTemp® HT Corrosion and Compatibility Testing Conducted by NSF® International Engineering Laboratories, Nov. 2008 :

Aluminum
Brass
Copper
Stainless steel
Steel-carbon
Galvanized steel
Iron
Silicon (E93, V97) (*)
Solder lead
Solder aluminum
PEX
PE
PVC



(*) Confirmatory testing by Federal Mogul®

GreenTemp® HT Utility Mix Flow Rates (1:1 Dilution, 1ATM, Ambient Temperature)

Pipe Size	Copper	Steel
½"	1 ½ GPM	2 GPM
¾"	4 GPM	4 GPM
1"	8 GPM	8 GPM
1 ¼"	14 GPM	16 GPM
1 ½"	22 GPM	25 GPM
2"	45 GPM	50 GPM

Anions

Bromide	<2.0
Chloride	200
Nitrate	<2.0

Standard Additives

GreenTemp® HT Inhibitor

– to address customer water quality variability, GreenTemp HT includes a pH-buffered solution of orthophosphate which bonds to oxidized metallic surfaces to form an insoluble, tenacious coating. GreenTemp® HT 's compounded coating acts as a protective layer between the base metal and the oxidizing conditions of the aqueous phase.

GreenTemp® HT Anti-bacterial Agent

- Triazine, 75.8% active agent

GreenTemp® HT Anti-microbial Agent

Installation Notes

GreenTemp HT is a low surface tension fluid. As an alternative to Teflon tape, use of high quality fixture sealants is advisable. When asked, we recommend Permatex® or Harvey TFE®, both of which are widely available.

