

# ADDITIVES INC.

## HTF Additive Packages

Additives Inc. specializes in the development and the production of additive packages used to make virgin, or recycled, propylene and ethylene glycol based heat transfer fluids. The use of Additives Inc. Add Paks and heat transfer fluid systems in your products and customers' systems will ensure: consistent product quality, economy, ease of blending corrosion prevention, long-life dependability, minimization of laboratory time and expense. Our chemists have developed a variety of stand-alone Add Paks for: glycol based heat transfer fluids, glycol based safety hydraulic fluids, and alkylate based high-temperature fluids. We can adjust formulations to meet your specific needs for performance-enhancing additives, in both light- and heavy-duty systems.

## Industry Specifications

Add Pak meets or exceeds the requirements of:

- ASTM D 1384  
Corrosion in glassware of steel, cast iron, aluminum, copper, brass and solder.
- ASTM D 2809  
Water pump cavitation erosion/corrosion test
- ASTM D 1881  
Foaming tendency test
- ASTM D 3306
- ASTM D 4340  
Aluminum corrosion at heat transfer surfaces
- ASTM D 4985
- ASTM D 2570  
Simulated service metal coupon corrosion test
- ASTM D 5216  
Automotive and light-duty antifreeze concentrate
- ASTM D 6257  
Automotive light-duty prediluted coolant

## Quality Control

To ensure quality control and assurance, all blending is controlled under ISO 9002 standards. Each individual batch of Add Pak is rigorously tested for conformance with product and industry specifications prior to storage, packaging, or shipment. The laboratory analysis is thoroughly conducted by Additives Inc. A Certificate of Analysis for each lot is produced and is available to customers.

## CLS-AP

*Closed Loop System Heat Transfer Fluid Add Pak  
Glycol-Based Inhibitor Package*

## Product Description and Applications

The Closed Loop System Heat Transfer Fluid Add Pak (CLS-AP) is for use with ethylene or propylene glycols, and may be used to make heat transfer fluids for these applications: HVAC systems, food processing heating and cooling units, process heat transfer systems, and many more. It is also an excellent Add Pak to make recreational vehicle (RV) antifreeze.

CLS-AP contains only food-grade ingredients. When it is used with the appropriate grade of propylene glycol which is Generally Regarded As Safe (GRAS) by the FDA/USDA, the heat transfer fluid produced can be used in applications where there is a possibility of incidental contact with food or beverage products in a processing facility. CLS-AP mixes readily with glycols at temperatures as low as 40°F, and can be stored without crystallization above 50°F.

The ingredients in CLS-AP inhibit corrosion of all metals commonly found in HVAC systems, and also are compatible with most plastic construction materials. Corrosion inhibition is provided in several ways: 1) metals are passivated, or protected, by thin, non-fouling molecular coatings ionically bonded to the surface; 2) pH of the glycol-water solution is buffered by an acid-neutralizing ingredient which acts to maintain the desired level of alkalinity; 3) dispersing-suspending agents help prevent scaling and fouling.

Propylene or ethylene glycol containing CLS-AP may be formulated to any concentration, with water containing up to 300 ppm (total) hardness (salts of magnesium, calcium, etc.). Higher hardness levels may cause excessive inhibitor consumption, scale deposits, and metal pitting.

## Product Specifications

Visual	Clear to cloudy colorless liquid
Odor	Somewhat bitter odor
Specific Gravity	1.25-1.45
Boiling Point	233°F
pH	12.0-12.8

## 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. CLS-AP in glycol (either ethylene or propylene) 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.

Water Quality And Dilution: Propylene or ethylene glycol-containing CLS-AP may be diluted to levels in the 30-50% glycol range with water containing up to 300 ppm (total) hardness (salts of magnesium calcium, etc.). Higher hardness levels may cause excessive inhibitor consumption, scale deposits and metal pitting.

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# CLS-AP

Closed Loop System Heat Transfer Fluid Add Pak, Glycol Based Inhibitor Package

## Use Instructions (continued)

Additives Inc. can provide fully-formulated CLS-AP inhibited glycols, diluted with deionized water, if the availability of a suitably balanced source of water is a problem.

### *Fluid Maintenance:*

Coolants made with CLS-AP can be reinhibited to maintain the integrity and quality of the glycol base and minimize the build-up of corrosion and glycol degradation by-products.

## ASTM Results

Results of the ASTM D 1384 Glassware Corrosion Test for a propylene glycol and water solution, with and without CLS-AP are shown below:

### 50% Propylene Glycol – Water Solutions (milligrams of metal loss per specimen)

Metal	with CLS-AP	without CLS-AP
Copper	1	5
Solder	2	350
Brass	3	10
Steel	1	250
Cast Iron	2	400
Aluminum	2	50

## Technical Support

Our laboratories will conduct a complete analysis of samples of our fluids from your systems quarterly. Simply send a one-pint sample to our laboratory and we will send you a written report including any recommendations on needed fluid maintenance actions. We will provide make-up inhibitor solutions as needed. We will also assist by testing samples to aid in problem solving efforts at any time.

## Technical Contact Information

### **Additives Inc.**

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