

PRODUCT CODE: 62080-1551

HTF ADDITIVE PACKAGES

Additives Plus 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 Plus' 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, and 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 specifications and/or requirements:

- ASTM D-1384
Corrosion in glassware of steel, cast iron, aluminum, copper, brass and solder.

QUALITY CONTROL

To ensure quality control and assurance, all blending is controlled under Additives' 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 Plus and/or our blending facility. A Certificate of Analysis for each lot is produced and is available to customers.

TECHNICAL CONTACT INFORMATION

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PRODUCT DESCRIPTION AND APPLICATIONS

HVAC-1 Heat Transfer Fluid Add Pak is a fully-formulated additive package developed for use with ethylene or propylene glycols, and may be used to make heat transfer fluids for HVAC systems, food processing heating and cooling units, process heat transfer systems, and more.

HVAC-1 mixes readily with glycols at temperatures as low as 40°F, and can be stored without crystallization above 50°F. The ingredients in HVAC-1 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 HVAC-1 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	1.20-1.29
Boiling Point	233°F
pH	10.0-11.0

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. HVAC-1 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 HVAC-1 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. Additives Inc. can provide fully-formulated HVAC-1 inhibited glycols, diluted with deionized water, if the availability of a suitably balanced source of water is a problem.

Fluid Maintenance: Coolants made with HVAC-1 can be re-inhibited to maintain the integrity and quality of the glycol base and minimize the build-up of corrosion and glycol degradation by-products.

TYPICAL ASTM RESULTS		
Typical results of the ASTM D-1384 Glassware Corrosion Test for a propylene glycol and water solution, with and without HVAC-1 are shown below:		
50% Propylene Glycol – Water Solutions (milligrams of metal loss per specimen)		
Metal	with HVAC-1	without HVAC-1
Copper	1	5
Solder	2	350
Brass	3	10
Steel	1	250
Cast Iron	2	400
Aluminum	2	50

BLENDING AND STORAGE INSTRUCTIONS FOR MAKING HEAT TRANSFER FLUIDS USING HVAC-1

APPLICATIONS

HVAC-1 Heat Transfer Fluid Add Pak is a fully-formulated additive system that can be mixed with propylene glycol or ethylene glycol to make heat transfer fluids comparable to the highest-quality national brands currently used across the country, and in some cases, around the world. HVAC-1 will produce fluids ideal for use in heating/air conditioning systems, heating and cooling units for food processing applications, solar heating systems, walkway/driveway deicing systems, process heating/cooling systems, and many others.

This Add Pak will produce fluids for light-to-medium duty applications such as those listed earlier. The normal operating temperatures of these fluids fall in the -50°F to 275°F range. Comparable fluids are Dowfrost, Dowfrost HD, Dowtherm, Dowtherm SR-1, Ucarfreeze, Ucartherm, and Jeffcool P and E Series

For heavier-duty applications, you should use the Additives Plus HDIS-1 Add Pak, which will produce fluids equivalent to Dow's Ambitrols and Union Carbide's Norkools. These fluids are used in more demanding applications including:

- Stationary engines used to drive natural gas compressors
- Electrical power generator sets
- Refinery and chemical processing cooling/heating systems
- Combustion air pre-heaters
- Industrial diesel engines
- Plastic injection molding cooling systems
- Pulp/paper processing plant cooling systems

BLENDING INSTRUCTIONS

Making heat transfer fluid concentrates or diluted finished products from Additives Plus Add Paks is relatively easy. The Add Paks contain all of the necessary corrosion inhibitors, glycol stabilizers, antifoams, dispersing/suspending polymers and dyes (if ordered with dye) that are needed to produce heat transfer fluids equivalent to or superior to the well-known national brands currently in widespread use. If our additive packages are stored at temperatures at or above 60°F, all ingredients will be totally in solution when you use them. However, since our additive packages are highly concentrated solutions, it is necessary to keep them stored

at the recommended temperatures or some crystallization can occur. If you detect any such problems, increase the temperature of the drum or container to 80°F to 100°F and hold it for 24 hours at this temperature, mixing it periodically, and store them at 60°F or higher after reconstituting all solids that were present.

If our Add Paks are properly stored, they will remain homogeneous solutions indefinitely. Making your finished heat transfer fluids is then simply a matter of mixing two homogeneous liquids together and can be completed in a short period of time.

TO MAKE AN EQUIVALENT TO DOWTHERM SR-1

The base for this product is ethylene glycol. Put the desired amount of industrialgrade, heat-transfer-fluid or antifreeze-grade ethylene glycol in a tank or container that can be agitated or circulated vigorously through a pump and recirculation line. Ensure that the glycol is at least 60°F before you add the Add Pak. If you want:

100 gallons of finished heat transfer fluid, add 96 gallons of ethylene glycol to your tank or vessel and heat to 60°F - 100°F, if necessary. Begin agitating or circulating the glycol and add 4 gallons of HVAC-1. This is 4% by volume of the desired final quantity of finished fluid. Agitate for 15-30 minutes or circulate through a pump and recirculating line until 3-5 vessel turnovers are achieved. If your fluid is circulating at a rate of about 100 gallons per minute and your tank contains 1000 gallons, it will take about 10 minutes to complete each turnover.

Test your product for whatever properties you include in your quality control program, visually inspect it for clarity and proper color, and keep a properly labeled one-quart or larger retain sample. You may also send a sample to our laboratory for a full specification analysis and written report at a nominal fee. See our website or product catalog to obtain the appropriate sample identification/submission forms to include with your sample(s).

TO MAKE AN EQUIVALENT TO DOWFROST HD:

The base for this product is propylene glycol. It contains 94.0% by volume propylene glycol, 2.0% by volume deionized water and 4% by volume of the Additives Plus HVAC-1 additive package.

First, determine how large a batch of finished heat transfer fluid you are going to make. For example, if you want to produce 100 gallons of an equivalent to Dowfrost HD you will need 94.0 gallons of industrial-grade, heat-transfer-fluidgrade or antifreeze-grade propylene glycol, 2.0 gallons of deionized water and 4 gallons of Additives Plus' HVAC-1 Add Pak. If you are making a product for food applications, use the Additives Plus CLS-AP Add Pak and GRAS or food-grade propylene glycol.

Put the desired amount of propylene glycol in a tank or container that can be agitated or circulated vigorously through a pump and recirculation line. Ensure that the glycol is at a temperature of at least 60°F before you continue to the next step.

Begin agitating or circulating the propylene glycol. Add the appropriate quantity of deionized water and mix it into the glycol until the solution is homogeneous. Ensure that the glycol/water solution is at a minimum of 60°F before proceeding.

Add the required amount of HVAC-1 Add Pak. Agitate for 15-30 minutes or circulate through a pump and recirculation line until 3-5 vessel turnovers are achieved. If your pump is circulating at a rate of about 100 gallons per minute and your tank contains 1000 gallons, it will take about 10 minutes to complete each turnover.

Test your product for whatever properties you include in your quality control program, visually inspect it for clarity and proper color, and keep a properly labeled one-quart or larger retain sample. You may also send a sample to our laboratory for a full specification analysis and written report at a nominal fee. See our website or product catalog to obtain the appropriate sample identification submission forms to include with your sample(s).

PROPER USE FOR HEALTH AND SAFETY

Precautions: Where skin contact may occur, chemical-impervious gloves should be worn. Use chemical goggles or full face shield when the danger of splashing exists. Wash any areas of skin contact thoroughly after use of this product. Avoid contact with skin, eyes and clothing. Do not take internally. Clean up spills immediately. Keep containers tightly closed when not in use. Store only in containers which are resistant to alkaline solutions with a pH of 12-14. Consult the MSDS for additional safety information.