ORISON

BioFROST® Concentrate

DESCRIPTION

BioFROST® is a concentrated biobased propylene glycol heat transfer fluid formulated with USP Grade propylene glycol to safely provide good heat transfer, freeze protection and corrosion protection. Designed to be diluted with DI or RO water at 35%-75%, the fluid is provided clear with an optional food grade dye for leak detection.

PERFORMANCE

BioFROST® meets the requirements of ASTM D8039* Heat Transfer Fluid for HVAC, and ASTM D1384, a corrosion standard commonly used to determine the ability of the fluid to provide corrosion inhibition in heated applications. Our quality corrosion package, provides outstanding corrosion protection of steel, copper, brass, solder, cast aluminum, and cast iron. BioFROST® lubricates pumps and valves, provides scaling resistance, is compatible with gaskets, seals, elastomers and other non-metallic pump and system parts.

SAFETY/ENVIRONMENT

BioFROST® is the leader in quality, safety and environmental concerns. It is a certified USDA Biobased Product in the USDA BioPreferred® Program and is NSF listed (HT1). BioFROST® is formulated from USP Grade biobased PG which is generally recognized as safe (GRAS) by the FDA. BioFROST® is not a petroleum derived product, it utilizes propylene glycol made from patented renewable processes which converts biobased glycerin into PG. Simply put, if you insist on a PG fluid, the BioFROST® family is the safest and most environmentally friendly products.

APPLICATIONS

Designed for industrial and environmentally sensitive antifreeze, coolant/heat transfer and secondary refridgerant applications, BioFrost can be used in several industrial heat transfer/antifreeze applications such as:

- Closed Loop Systems
- Waste Heat Recovery
- Chillers
- Solar Systems
- Floor Heating Systems
- HVAC*
- Geothermal Systems
- Hydrostatic/Pressure Testing

USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 100%

NSF registered and acceptable for use where there is possibility of incidental food contact (HT1).

NSF

Typical Concentrate Properties

Color: Clear (dye available)
pH: 8.5 - 11
Specific Gravity (70F): 1.048
Freeze Point: below -60F
Boiling Point: >310F

*Addition of TRAMFLOC® 1142 FOAM CONTROL AGENT required for ASTM D8309. TRAMFLOC® 1142 FOAM CONTROL AGENT is a nonionic, nonsilicone, food grade defoamer. TRAMFLOC® 1142 FOAM CONTROL AGENT performs well in a wide range of pH and temperatures. All ingredients used in the manufacture of TRAMFLOC® 1142 FOAM CONTROL AGENT are either GRAS or listed in the Code of Federal Regulations: Title 21, Section 173.340. Recommended use at 1 oz/ 10 - 20 gallons of system fluid. Available from Orison.

HMIS	
HEALTH	0
FLAMMABILITY	1
INSTABILITY	0
SPECIFIC	0

Note: Solutions of BioFROST™ less than 30% may be at risk for bacterial contamination.

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The chart(s) below is/are supplied as a guide for diagnostic / maintenance purposes. The values are calculated values and are only approximations. This is not a specification. Custom blending is available to meet specific physical properties such as freeze point and/or heat transfer capabilities.

BioFROST® % (vol.)	PG* Refractometer	Specific Gravity @70°F	Freeze Point °F / °C	Boiling Point °F / °C	Specific Heat @ 70° F	Viscosity cSt @ 68° F (20° C)
100	99	1.048	< -60° / <-51°	>310° / >154°	0.6	43
90	91	1.049	< -60° / <-51°	265° / 129°	0.63	25
80	80	1.049	< -60° / <-51°	241° / 116°	0.72	16
70	69	1.049	< -60° / <-51°	229° / 109°	0.78	11
60	59	1.047	-53° / -47°	224° / 107°	0.82	8
50	50	1.043	-25° / -31.6	222° / 106°	0.85	6
40	39	1.036	-4.5° / -20°	219° / 104°	0.89	4
30	30	1.029	10° / -12°	216° / 102°	0.93	2.6

* Refractometer readings are with a meter calibrated for Propylene Glycol. The readings do not reflect actual PG volume %'s as the corrosion inhibitor has similar refractive properties.

Temperature °F	%vol. BioFROST® Required	
	BioFROST® Freeze Potection	BioFROST® Burst Protection
20	18.7*	12.6*
10	30.4	20.9*
0	37.7	25.1
-10	44.0	29.3
-20	48.2	31.4
-30	52.4	34.6
-40	56.5	36.6
-50	59.7	36.6
-60	62.8	36.6

*These dilutions result in glycol concentrations <20% which may be at risk of bacterial contamination and low inhibitor levels. Recommended dilutions are 30%-70% with DI or RO water.