UTILITY WONDER PRODUCTS

SUPER POLAR GRADE NO-FREEZ

PROTECTS SYSTEMS TO -100°F. & BEYOND

NON-TOXIC HEAT TRANSFER FLUID

CONCENTRATE

MAXIMUM ANTI-FREEZE

TECHNICAL BULLETIN

SPNF1004

NO-FREEZ Heat Transfer fluids are ideal for use in poorly insulated heating systems, such as summer homes, mountain cabins with low set thermostats, motels closed in winter, pleasure craft, marinas, recreation vehicles, solar units, factories and sprinkler systems, etc.

SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** is pure high grade propylene glycol with special anti-corrosion inhibitors and color indicators. NO-FREEZ products contain propylene glycol because propylene glycol is the only material safe for most ordinary anti-freeze requirements. This is because propylene glycol is non-toxic and non-irritating and eliminates the possibility of contaminating domestic, potable water with toxic materials. Beware of products that may contain other ingredients such as methanol, ethanol or ethylene glycol, which cheapen these products and raise the toxicity of the anti-freeze. This defeats the very reason for using non-toxic anti-freeze. Also beware of products that are not inhibited or require you to add inhibitor bought separately. Don't endanger your system by using corrosive, uninhibited material. Proper amounts of the correct inhibitors are expensive and necessary. Uninhibited material is not a bargain. Do not use automobile anti-freeze. It contains ethylene glycol which is very toxic.

The best way to test freeze protection is with a refractometer. Refractometers are extremely accurate, easy to use and effective, regardless of solution colors, dyes and temperature. **UTILITY** offers refractometers for sale as an accommodation to NO-FREEZ users. Included with the refractometer are comprehensive instructions specifically written for NO-FREEZ applications. When a refractometer is not available, **UTILITY** NO-FREEZ **QUICK CHECK TEST STRIPS** may also be used.

NO-FREEZ lubricates pumps, valves and moving parts and will not harm plastic or rubber seals, diaphragms or washers. NO-FREEZ will not support bacterial growth.

First to develop non-toxic anti-freeze in potable systems for the plumbing and heating industries, **UTILITY** manufactures NO-FREEZ to the highest standards in laboratory facilities. With over 100 years of expertise, our dedication and commitment is your constant assurance of the very latest in technology and engineering, resulting in the finest non-toxic anti-freeze available.

DIRECTIONS

1. All new or existing systems should be thoroughly cleaned with **UTILITY PREP Hydronic System Cleaner** or equivalent before utilizing SUPER **POLAR GRADE NO-FREEZ CONCENTRATE**.
2. Empty and flush entire system through faucets, petcocks and other openings. Then close all openings.
3. Replace all water in the system with an equal amount of SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** solution. SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** can be used to make less concentrated solutions using the chart as a guideline to make desired solutions. Do not make solutions less concentrated than those shown on the chart. They do not offer proper protection.
4. Be sure to protect all drains by adding SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** to traps and toilets to prevent freezing. Open each faucet to be sure SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** has displaced any water pockets. Close faucets when blue-green color of SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** appears.
5. For circulating hot water heating systems and solar heating and cooling systems, SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** may remain in system all year. Be sure to flush the system thoroughly to remove oil, dirt or scale prior to introduction.
6. Test the system for freeze protection and inhibitor level. Additional NO-FREEZ **INHIBITOR** may be needed. Test the system annually thereafter.
7. SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** solutions protect by lowering the freeze point. Below the freeze point, ice crystals begin to form and the remaining solution becomes more concentrated. This allows SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** to become a flowable slush. Unlike water, SUPER **POLAR GRADE NO-FREEZ CONCENTRATE** actually contracts as it gets colder until a point where it will again start to expand. But since it remains a flowable slush, it can flow into available expansion volume in the system.

SPECIAL CONSIDERATIONS

Do not use NO-FREEZ in systems containing galvanized pipe or aluminum. NO-FREEZ has a greater tendency to leak past faulty joints than water, so all leaks must be corrected properly. **UTILITY** *Qwik Seal Powdered Stop-leak* is the only chemical stop-leak that can be used, without risk of incompatibility, to correct leaks in systems containing NO-FREEZ. If your water system has an automatic makeup system, it should not be used because it can dilute and contaminate the system. New systems should be designed with an air cushion as much as 20% larger than required for water only systems to allow for low and high temperature expansion. In order to avoid a loss in heat transfer efficiency, new systems should be sized for increased flow rate to compensate for the lower Specific Heat of NO-FREEZ solutions and, therefore, have no efficiency loss.

NO-FREEZ is stable and suitable for use at continuous operating temperatures to 250°F, and will not degrade significantly from short exposure to temperatures up to 350°F. NO-FREEZ will not foam, if foaming occurs it is due to other factors, such as air or contamination in the system. Be sure the system is free from dirt, grease, oil and other contaminants before installing NO-FREEZ. As with any chemical product, compatibility should be checked prior to introducing NO-FREEZ.

SUPER POLAR GRADE NO-FREEZ CONCENTRATE

MAXIMUM ANTI-FREEZE

SPECIAL TECHNICAL CHARACTERISTICS

PERCENTAGE PRODUCT IN SOLUTION		30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
MIXING PROPORTION	PARTS PRODUCT / PARTS WATER	3/7	7/13	2/3	9/11	1/1	11/9	3/2	13/7	7/3	3/1
EXPANSION DAMAGE PROTECTION POINT		-54°F.	-61°F	-69°F.	-77°F.	-86°F.	-100°F.	-103°F.	-106°F.	-109°F.	-112°F.
FLOW POINT		-6°F.	-19°F.	-30°F.	-42°F.	-50°F.	-61°F.	-64°F.	-68°F.	-71°F.	-75°F.
REFRACTIVE INDEX *n*D		1.364	1.369	1.375	1.380	1.386	1.390	1.395	1.400	1.404	1.409
THERMAL CONDUCTIVITY BTU / (HR.) (SQ. FT.) (°F./FT.)	-10°F.	0.260	0.252	0.245	0.240	0.231	0.225	0.220	0.213	0.209	0.207
	0°F.	0.262	0.253	0.246	0.241	0.231	0.225	0.219	0.211	0.207	0.204
	10°F.	0.264	0.254	0.247	0.242	0.230	0.224	0.217	0.209	0.205	0.202
	20°F.	0.266	0.255	0.248	0.242	0.230	0.223	0.215	0.206	0.200	0.198
	30°F.	0.268	0.259	0.248	0.242	0.229	0.222	0.213	0.205	0.198	0.195
	40°F.	0.270	0.259	0.249	0.243	0.229	0.221	0.212	0.202	0.195	0.192
	50°F.	0.271	0.259	0.250	0.243	0.228	0.220	0.211	0.200	0.193	0.190
	60°F.	0.272	0.261	0.251	0.244	0.228	0.219	0.208	0.197	0.190	0.186
	70°F.	0.274	0.263	0.252	0.244	0.228	0.218	0.207	0.195	0.187	0.183
	80°F.	0.277	0.264	0.254	0.245	0.228	0.217	0.205	0.192	0.184	0.179
	90°F.	0.279	0.265	0.254	0.245	0.227	0.216	0.203	0.190	0.182	0.177
	100°F.	0.281	0.267	0.256	0.246	0.227	0.215	0.203	0.189	0.178	0.174
	110°F.	0.283	0.268	0.257	0.246	0.226	0.214	0.201	0.185	0.175	0.170
	120°F.	0.287	0.271	0.257	0.246	0.226	0.213	0.199	0.183	0.172	0.167
	130°F.	0.289	0.273	0.258	0.247	0.225	0.212	0.197	0.181	0.170	0.165
	140°F.	0.291	0.274	0.259	0.248	0.225	0.211	0.196	0.178	0.167	0.161
DENSITY gms. / ml.	-20°F.	1.040	1.051	1.050	1.055	1.062	1.065	1.067	1.071	1.075	1.076
	0°F.	1.035	1.047	1.047	1.051	1.057	1.060	1.062	1.065	1.068	1.069
	20°F.	1.032	1.038	1.043	1.047	1.052	1.055	1.056	1.059	1.061	1.062
	40°F.	1.028	1.033	1.038	1.042	1.046	1.049	1.050	1.053	1.055	1.055
	80°F.	1.019	1.023	1.027	1.029	1.033	1.035	1.036	1.038	1.039	1.039
	100°F.	0.993	0.995	0.997	0.999	1.002	1.010	1.019	1.030	1.032	1.032
	180°F.	0.986	0.988	0.989	0.991	0.993	0.994	0.994	0.995	0.996	0.996
SPECIFIC HEAT BTU / LB. / DEGREE FAHRENHEIT	40°F.	0.94	0.92	0.90	0.88	0.85	0.83	0.84	0.84	0.85	0.85
	80°F.	0.95	0.93	0.91	0.89	0.87	0.85	0.82	0.83	0.95	1.00
	120°F.	0.93	0.91	0.95	0.94	0.92	0.90	0.88	0.87	0.85	1.00
	160°F.	0.96	0.90	0.97	0.96	0.96	0.94	0.93	0.88	0.92	1.00
	200°F.	0.88	0.88	0.87	0.96	0.94	0.93	0.92	0.91	0.90	1.00
	240°F.	0.96	0.95	0.94	0.93	0.91	0.90	0.89	0.92	0.97	1.00
VISCOSITY CENTIPOISE	0°F.	17	22	35	45	66	84	103	176	390	480
	50°F.	3.8	4.8	6.3	7.4	10	13	14	20	35	41
	100°F.	1.6	1.8	2.1	2.4	3.1	3.5	3.8	4.8	7.5	8.6
	150°F.	0.8	1.0	1.2	1.3	1.6	1.8	1.8	2.1	2.9	3.2
	200°F.	0.5	0.6	0.7	0.7	0.7	0.8	0.9	1.2	1.6	1.8

THE SPECIFICATIONS LISTED ARE FOR TYPICAL IDEAL SITUATIONS. CONTAMINANTS IN THE SYSTEM MAY ALTER THE CHARACTERISTICS OF THIS PRODUCT.

HOW TO SIZE YOUR SYSTEM

THE CAPACITY OF YOUR BOILER CAN BE FOUND ON THE BOILER PLATE, IN THE BOILER MANUAL OR CONTACT THE MANUFACTURER. USE THE FOLLOWING CHART TO HELP SIZE THE PIPING IN YOUR SYSTEM.

Nominal size		Gallons Per 100 ft. of Length	Length in Feet Per Gallon
3/8"	Type "L" Copper Tubing	0.753	132.6
1/2"	Type "L" Copper Tubing	1.21	82.6
5/8"	Type "L" Copper Tubing	1.81	55.2
3/4"	Type "L" Copper Tubing	2.51	39.8
1"	Type "L" Copper Tubing	4.29	23.4
1 1/4"	Type "L" Copper Tubing	6.55	15.3
1 1/2"	Type "L" Copper Tubing	9.25	10.8
2"	Type "L" Copper Tubing	16.05	6.2
2 1/2"	Type "L" Copper Tubing	24.78	4.0
3"	Type "L" Copper Tubing	35.38	2.8
3 1/2"	Type "L" Copper Tubing	47.84	2.1
4"	Type "L" Copper Tubing	62.	1.6
5"	Type "L" Copper Tubing	97.1	1.0
6"	Type "L" Copper Tubing	139.2	0.7
3/8"	Standard Steel Pipe	1.0	100.0
1/2"	Standard Steel Pipe	1.6	63.3
3/4"	Standard Steel Pipe	2.8	36.0
1"	Standard Steel Pipe	4.5	22.2
1 1/4"	Standard Steel Pipe	7.8	12.8
1 1/2"	Standard Steel Pipe	10.5	9.5
2"	Standard Steel Pipe	17.5	5.7
2 1/2"	Standard Steel Pipe	25.0	4.0
3"	Standard Steel Pipe	39.0	2.6
3 1/2"	Standard Steel Pipe	53.0	1.9
4"	Standard Steel Pipe	66.7	1.5

Stock Number	Size & Description	Pack	Lbs./ case
18-430	1 GALLON SUPER POLAR NO-FREEZ CONCENTRATE	4	36
18-431	5 GALLON SUPER POLAR NO-FREEZ CONCENTRATE	1	46
18-434	55 GALLON SUPER POLAR NO-FREEZ CONCENTRATE	1	500
18-465	REFRACTOMETER	1	1
18-460	NO-FREEZ QUICK CHECK TEST STRIPS	6	1
18-470	8 OZ. CONTAINERS NO-FREEZ INHIBITOR	12	7

Also available:

NO-FREEZ, POLAR GRADE NO-FREEZ & ALUMINUM SAFE POLAR GRADE NO-FREEZ

MADE IN USA

UTILITY

UTILITY WONDER PRODUCTS

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