ORISON

IceClear® PGX

Propylene Glycol Replacement

IceClear® PGX is a highly refined, bio-based alternative to petroleum derived propylene glycol (PG). IceClear® PGX can be used as delivered or diluted to achieve desired results. IceClear® PGX is a cost effective substitute for PG in many commercial, industrial and agricultural applications, including the following:

- Heat Transfer Fluids
- Freeze Conditioners
- Coal and Ore Treatments
- Deicing Fluids
- Antifreeze/Coolant Formulations
- Hydraulic Fluids
- Dust Suppressants
- Frost Protectant for Agricultural Products (e.g. Fruits)

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

IceClear® PGX is available with a corrosion inhibitor added for closed loop systems as ***IceClear® Anti-Freeze (AF).***

Derived from agricultural materials or bio-based processes, this environmentally friendly product is engineered to match the freezing point performance of conventional antifreeze products based on glycols (see Figure 1), but with the following advantages:

Cost-effective. IceClear® PGX is formulated from complex carbohydrates derived from renewable resources and/or process side streams that facilitate cost-effective and not subject to the market swings of glycols.

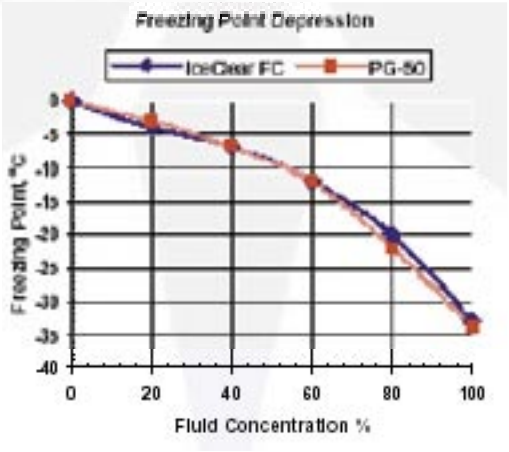

Figure 1. Performance Comparison - Freezing Point of IceClear® PGX vs. Propylene Glycol

Typical Properties

· Color	Clear Liquid
· Odor	Mild
· pH	7
· Water Solubility	100%
· Specific Gravity	1.15
· Viscosity @ 20°C (cSt)	11.0
· Freeze Point	-34 °C (-30 °F)

Better Physical Properties. IceClear® PGX is more viscous than conventional antifreeze materials. As such, it adheres to particle surfaces and clings to transportation and conveying equipment with little run-off and settling. This prevents freezing, clumping and sticking, and keeps product moving freely.

Won't Dry Out. Due to its viscous nature and hygroscopic character, IceClear® PGX will not dry out after initial application, making it effective for extended periods of time as an antifreeze and a dust suppressant.

Environmentally Friendly. IceClear® PGX is non-toxic, contains no salts, heavy metals or solvents, it is non-corrosive, fully biodegradable (with a lower BOD/COD than glycol), and it will not affect combustion processes.

IceClear® PGX %	Brix Value (Refractometer)	Freeze Point °F / °C	Boiling Point °F / °C	Specific Heat @ 35° F	Viscosity cSt @ 68° F (20° C)
100	46.6	-30° / -34°	228° / 109°	.74	11
90	42.5	-17° / -27°	225° / 107°	.775	8
80	38.4	-8° / -22°	222° / 106°	.804	6
70	34.1	0° / -18°	220° / 104°	.826	5
60	30.2	7° / -14°	218° / 103.5°	.848	3
50	25.6	13° / -10°	217° / 103°	.866	2.5

HMIS	
HEALTH	0
FLAMMABILITY	0
INSTABILITY	0
SPECIFIC	0

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05/27/2011

IceClear PGX or AF									
Thermal Conductivity Gram Calories, Second, -1cm, -2C, -1cm(2)									
By Weight					a20(1)%				
%	10C	20C	30C	40C	50C	60C	70C	80C	C-1
0	0.00138	0.00138	0.00138	0.00138	0.00138	0.00138	0.00138	0.00138	0.26
25	0.00125	0.00128	0.00131	0.00134	0.00137	0.0014	0.00143	0.00146	0.23
50	0.00112	0.00115	0.00117	0.0012	0.00122	0.00124	0.00126	0.00129	0.20
75	0.00102	0.00103	0.00105	0.00106	0.00108	0.0011	0.00111	0.00113	0.15
100	0.00090	0.00091	0.00091	0.00092	0.00093	0.00094	0.00095	0.00096	0.10