

ORISON

IceClear® HD



HEAVY DUTY / PRE-DILUTED Non-Nitrite Glycerin AntiFreeze

DESCRIPTION

IceClear® HD is a patented biobased, ready-to-use, non-glycol antifreeze / heat transfer fluid which combines highly refined glycerin meeting ASTM D7640 and the industry leading NAP free corrosion inhibitor package.

PERFORMANCE

IceClear® HD meets the requirements of ASTM 7714 and ASTM 7715. Our state-of-the-art, non-nitrated corrosion package, provides outstanding protection against liner pitting and corrosion of steel, copper, brass, solder, cast aluminum, and cast iron. IceClear HD® lubricates pumps and valves, provides excellent scaling resistance, is compatible with gaskets, seals, elastomers and other non-metallic pump and engine parts (not recommended for use with CPVC), offers a freeze point of -31° F, and burst protection to -50° F. IceClear® HD provides protection up to a 350,000 + mile change interval in properly maintained engine systems.

SAFETY/ENVIRONMENT

IceClear® HD is the leader in quality, safety and environmental concerns. HD is a certified USDA Biobased Product in the USDA BioPreferred® Program and is NSF listed (HT2). IceClear HD is readily biodegradable, non-toxic, non-hazardous and has a neutral pH. Glycerin is considered "GRAS", (Generally Recognized As Safe) by the FDA (Federal Food and Drug Administration).



APPLICATIONS

Designed for industrial and environmentally sensitive antifreeze, coolant/heat transfer and secondary re Fridgerant applications, IceClear® HD can be used in virtually all gasoline, diesel and natural gas engines and other applications such as:

- Fleet/Automotive
- Closed Loop Systems
- Solar Systems
- Floor Heating Systems
- Directional Drilling Fluid
- Hydrostatic/Pressure Testing

ADVANTAGES

- | | |
|-------------|---------------|
| Biobased | No Silicone |
| Non-Toxic | No Molybdates |
| NSF Listed | No Phosphates |
| Non-Glycol | Non-Hazardous |
| Neutral pH | Non-Flammable |
| No Nitrites | Lower BOD/COD |

FLUID TESTING

IceClear® HD is a glycerin based product. Freeze point range and inhibitor concentrations can quickly be determined by testers available from Orison or more accurately by a refractometer (Brix). See page 2 for maintenance recommendations, chart showing Brix readings and freeze point. Do not use glycol testers to determine freeze point or inhibitor protection.

WHAT ABOUT MIXING FLUIDS

Use only IceClear HD® in the system. This product is designed for those who desire to implement a green alternative and have complete control of the cooling systems, including top off. Although no negative effects are expected, mixing coolants/antifreeze is not recommended due to varying physical properties of the freeze point depressants and corrosion inhibitor technologies which leads to difficulties determining actual freeze point protection and corrosion inhibition.

*(see maintenance directions on page 2)

NOTE:

The freeze point of the final coolant in the cooling system is determined by the extent of dilution of this product with any liquid remaining in the cooling system at the time of filling.

US Patents
One or more claims 5,876,621; 5,980,774; 6,506,318; 6,890,451;
7,270,768 and issued and pending continuations thereof.

Typical Properties

- | | |
|--------------------------|-------------------|
| • Color | Orange Liquid |
| • Odor | Mild |
| • pH | 7.5 - 8.9 |
| • Specific Gravity | 1.15 |
| • Viscosity @ 20°C (cSt) | 11.0 |
| • Freeze Point | -31° F (-35° C) |
| • Boiling Point | 228.2° F (109° C) |
| • VOC's | None Known |

HMIS	
HEALTH	1
FLAMMABILITY	0
INSTABILITY	0
SPECIFIC	0

4801 South Danville Drive * Abilene, TX 79602 * Ph. 325.692.1135 * Fax 325.690.0569
Commercial: www.orisonmarketing.com Gov't/Military: www.orisonllc.com

MAINTENANCE DIRECTIONS

1. Use straight, DO NOT DILUTE.
2. Drain cooling system completely* and flush with HD COOLING SYSTEM CLEANER to remove scale & rust build-up. Use only IceClear® HD in the system and fill only after system has been completely drained and flushed. Do not mix with other coolants / anti-freeze / heat transfer fluids or chemicals.
3. Use only IceClear® HD in the system and fill only after system has been completely drained and flushed. Do not mix with other coolants / anti-freeze / heat transfer fluids or chemicals*.
4. Use ONLY CHEMICAL FREE FILTERS.
5. Check fluid level on regular maintenance schedule. Top off with only undiluted IceClear® HD if system is low.
6. Test fluid for freeze point and inhibitor levels every 50,000 miles, 1500 hours or every 6 months, whichever comes first. Recommended to drain and recharge with new IceClear® HD if test strip shows to replace fluid or Brix value is less than 37.0 as this indicates the product has been diluted more than 20%. IceClear® HD lab analysis is available through Orison.
7. Add IceClear® HD EXTENDER every 100,000 miles, 2500 hours or if inhibitor level shows less than 7000ppm; whichever comes first.

The chart below is supplied as a guide for diagnostic / maintenance purposes. The values are calculated values and are only approximations. IceClear® HD is ready-to-use and not to be diluted as the result would weaken the corrosion inhibitor package. Custom blending is available to meet specific physical properties such as freeze point and/or heat transfer capabilities.

IceClear® HD % / Spec. Grav.	Brix Value (Refractometer)	Freeze Point °F / °C	Boiling Point °F / °C	Specific Heat @ 35° F	Viscosity cSt @ 68° F (20° C)
100 / 1.155	46.5	-31° / -35°	228° / 109°	.74	10.8
90 / 1.139	42.1	-17° / -27°	225° / 107°	.77	7.9
80 / 1.123	37.5	-6° / -21°	222° / 106°	.81	5.5
70 / 1.106	33.1	2° / -17°	219° / 104°	.83	4.1
60 / 1.09	28.7	9° / -13°	218° / 103.5°	.85	3.2
50 / 1.07	24.1	15° / -9.5°	217° / 102.8°	.87	2.5

ANALYTICAL FROM ASTM D7715

ASTM D7715 specification covers the requirements for fully formulated coolants for cooling systems of Heavy Duty Engines and includes ASTM D7714 as a pre-requisite. ASTM D7714 specification covers the requirements for Automobile and Light-Duty Service.

ASTM D1122 Relative Density	ASTM D1121 Reserve Alkalinity
ASTM D1177 Freeze Point	ASTM D1881 Foaming Tendencies
ASTM D1120 Boiling Point	ASTM D2809 Cavitation Corrosion and Erosion-Corrosion Characteristics of Aluminum Pumps With Engine Coolants.
ASTM D1882 Auto Finish Effect	ASTM D4340 Corrosion of Cast Aluminum Alloys in Engine Coolants Under Heat-Rejecting Conditions
ASTM D1119 Ash Content	ASTM D1384 Corrosion Test for Engine Coolants in Glassware
ASTM D1287 pH	ASTM D2570 Simulated Service Corrosion Testing of Engine Coolants
ASTM D5827 Chloride	HSSR Scaling Resistance of Engine Coolants on Hot Steel Surfaces
ASTM D1123 Water Mass Percent	

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