

# ORISON

## IceClear® FF

### FLOOR & FURNACE Glycerin Anti-Freeze / Heat Transfer Fluid

#### DESCRIPTION

IceClear® FF is a patented biobased, ready-to-use, non-glycol anti-freeze / heat transfer fluid which combines highly refined glycerin and the industry leading corrosion inhibitor package.

#### PERFORMANCE

IceClear® FF meets the requirements of ASTM D2809, ASTM 4340, ASTM 1384, and ASTM D2570. Our state-of-the-art, non-nitrated corrosion package, provides outstanding extended protection against corrosion of steel, copper, brass, solder, cast aluminum, and cast iron. IceClear FF 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 -20° F, burst protection to -50° F and will not support bacterial growth. IceClear® FF provides extended life up to 5 years in a properly maintained static or low temperature system (<200° F).

#### SAFETY/ENVIRONMENT

IceClear® FF is the leader in quality, safety and environmental concerns. IceClear FF is biobased, readily biodegradable, non-toxic, non-hazardous and has a neutral pH. IceClear® FF is considered "GRAS", (Generally Recognized As Safe) by the FDA (Federal Food and Drug Administration), combining highly refined and/or food-grade glycerin and an industry proven premier corrosion inhibitor package which does not include old technology such as nitrites, molybdates or phosphates.

#### APPLICATIONS

Designed for industrial and environmentally sensitive anti-freeze and heat transfer applications, IceClear® FF can be used in many static and low temperature applications such as:

- Solar Systems
- Floor Heating Systems
- HVAC
- Hydrostatic/Pressure Testing

#### FLUID TESTING

IceClear® FF is a glycerin based product. Freeze point range can quickly be determined by specific gravity or more accurately by a refractometer (Brix). Recommended drain and recharge with IceClear® FF if Brix value is less than 41.0 as this indicates the product has been diluted. A chart showing Brix readings and freeze point is available on page 2. Do not use glycol testers to determine freeze point protection.

#### WHAT ABOUT MIXING FLUIDS

Although no negative effects are expected, mixing anti-freeze/coolants is not recommended due to varying freeze point depressants and corrosion inhibitor technologies which leads to difficulties determining actual freeze point protection and corrosion inhibition properties.

#### ADVANTAGES

Biobased  
Non-Toxic  
Neutral pH  
No Nitrites  
Non-Glycol  
Non-Hazardous  
Non-Flammable  
Lower BOD/COD  
Lower Freeze Point

**Custom blending is available to meet specific physical properties such as freeze point and/or heat transfer capabilities**

#### Typical Properties

|                          |                  |
|--------------------------|------------------|
| · Color                  | Orange Liquid    |
| · Odor                   | Mild             |
| · pH                     | 7.5 - 9.5        |
| · Water Solubility       | 100%             |
| · Specific Gravity       | 1.14             |
| · Density                | @ 9.5 lbs/gallon |
| · Viscosity @ 20°C (cSt) | 8.5              |
| · Freeze Point           | -20° F (-29° C)  |
| · Boiling Point          | 226° F (108° C)  |

| HMIS         |   |
|--------------|---|
| HEALTH       | 0 |
| FLAMMABILITY | 0 |
| INSTABILITY  | 0 |
| SPECIFIC     | 0 |

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## **MAINTENANCE DIRECTIONS**

1. Use straight, DO NOT DILUTE.
2. Use only IceClear® FF in the system. Do not mix with other anti-freeze/heat transfer fluids or chemicals.
3. Use only chemical free filters.
4. Check fluid and filters on regular maintenance schedule or as indicated by original equipment manufacturer. Top off with only undiluted IceClear® FF if system is low. Recommended drain and recharge with IceClear® FF if Brix value is less than 41.0 as this indicates the product has been diluted.
5. Scheduled IceClear® FF lab analysis is available through Orison.

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

| <b>IceClear® FF<br/>% / Spec. Grav.</b> | <b>Brix Value<br/>(Refractometer)</b> | <b>Freeze Point<br/>°F / °C</b> | <b>Boiling Point<br/>°F / °C</b> | <b>Specific Heat<br/>@ 35° F</b> | <b>Viscosity cSt<br/>@ 68° F (20° C)</b> |
|---|---------------------------------------|---------------------------------|----------------------------------|----------------------------------|--|
| 100 / 1.144                             | 43                                    | -20° / -29°                     | 226° / 108°                      | .77                              | 8.5                                      |
| 90 / 1.125                              | 38.5                                  | -8° / -22°                      | 223° / 106°                      | .80                              | 5.7                                      |
| 80 / 1.112                              | 34.6                                  | -1° / -18°                      | 221° / 105°                      | .82                              | 4.6                                      |
| 70 / 1.099                              | 30.9                                  | 5° / -15°                       | 219° / 104°                      | .84                              | 3.6                                      |
| 60 / 1.082                              | 26.4                                  | 12° / -11°                      | 217° / 103°                      | .86                              | 2.8                                      |
| 50 / 1.07                               | 22                                    | 17° / -8°                       | 215° / 102°                      | .87                              | 2.3                                      |

## **HOW MUCH ICECLEAR FF DOES MY SYSTEM NEED?**

| <b>IceClear Pipe Volume Table</b>              |                      |             |           |               |           |               |           |               |           |
|--|----------------------|-------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
|  | <b>Pipe Diameter</b> |             |           |               |           |               |           |               |           |
|  | <b>1/2"</b>          | <b>3/4"</b> | <b>1"</b> | <b>1 1/2"</b> | <b>2"</b> | <b>2 1/2"</b> | <b>3"</b> | <b>3 1/2"</b> | <b>4"</b> |
| <b>Gallons Per 100' Copper Tubing (Type L)</b> | 1.2                  | 2.5         | 4.3       | 9.3           | 16.1      | 24.8          | 35.4      | 47.8          | 62.0      |
| <b>Gallons Per 100' Steel Pipe</b>             | 1.6                  | 2.8         | 4.5       | 10.5          | 17.5      | 25.0          | 39.0      | 53.0          | 66.7      |

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