



FC Fluid-D

Conoco FC Fluid-D is a water-glycol based fire resistant hydraulic fluid developed for use in hydraulic systems operating at constant pressure in the range of 2,000-3000 psi in areas subject to fire hazards. It can withstand intermittent pressure spikes up to 5,000 psi. It contains water to snuff out a fire resulting from ignition of a fluid leak.

FC Fluid-D is formulated with 60 percent diethylene glycol and 40 percent water. It is fortified with additives that provide lubricity, wear protection and corrosion protection for extended life of hydraulic system components. It contains less than 60 parts per billion (PPB) phenols and does not contain any nitrites or nitrosamines.

FC Fluid-D has good antiwear properties to ensure long life for hydraulic pumps and motors. Special rust and corrosion inhibitors provide corrosion protection in both the liquid and the vapor phase. This product is compatible with other water-glycol type fire resistant fluids.

FC Fluid-D is compatible with most pump types including vane, piston and gear pumps. It is safe to use with most packing and seal materials except polyurethane and silicone. Cork shaft seals should be replaced with Buna N or other synthetic rubber. Leather packing should be avoided and zinc or cadmium plated components should not be used.

Applications

Hydraulic systems operating in areas subject to fire hazards such as:

- Steel and aluminum mills
- Molding and metal die casting machinery
- Welding machines
- Foundries
- Furnace charging equipment
- Open hearth and basic oxygen furnace (B.O.F.) equipment
- Power transmission plants
- Underground mines

FC Fluid-D meets the performance requirements of:

- Denison HF-4 Hydraulic Fluid – Water Glycols

**Water-Glycol
Based Fire
Resistant
Hydraulic Fluid**

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- Factory Mutual Group I Fluid
- Ford M6C1C
- U.S. Steel 171 Water-Glycol Fluids

Caution: FC Fluid-D should not be used in systems where operating temperatures exceed 175°F (79°C). This product contains water and should not be stored at temperatures over 130°F (54°C). In addition, this product is not recommended for use as a conventional antifreeze coolant for automotive or industrial applications.

Outstanding Features

- Fire resistant for safety
- Excellent wear protection
- Excellent rust and corrosion protection
- Good foam resistance
- Glycol content protects against freezing
- Compatible with other water-glycol fluids
- Dyed red color for easy identification

FC Fluid-D Typical Properties

ISO Grade	46
Specific Gravity @ 15.6°C (60°F)	1.08
Density, lbs/gal	9.00
Color, Visual	Red
Freezing Point, °C (°F)	-55 (-48)
Viscosity,	
cSt @ 40°C	40.0
cSt @ 100°C	8.45
SUS @ 100°F	202
SUS @ 210°F	54.5
Viscosity Index	200
Alkalinity Reserve	210
Four-Ball Wear, ASTM D4172, Scar Diameter, mm	0.60
pH (neat)	9.6
Rust Test, ASTM D665 A&B	Pass
Water, wt %	40

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Care and Maintenance of FC Fluid-D

All water-containing fire resistant fluids require close maintenance of the water content to ensure safe operation. To keep FC Fluid-D operating at maximum efficiency, the water content and alkalinity level (pH) should be checked routinely and adjusted as necessary to maintain good fire resistance, corrosion protection and proper viscosity.

Water content can be determined with the use of a refractometer and Brix scale provided by the refractometer manufacturer or by Karl Fisher titration. Digital refractometers are available that will give a direct reading of the water content. The viscosity of the fluid is an indirect measure of the water content of the fluid. Table 1 below shows the amounts of water or glycol to be added at different viscosities to maintain the proper water content for FC Fluid-D.

Alkalinity is determined by measuring the pH of the fluid. The pH should be adjusted as necessary to maintain a pH level of 9.6. Alkalinity may be adjusted by adding small amounts of morpholine to the make-up water. Consult with your morpholine supplier for the proper amount to be added.

**Table 1
Recommended Water/Glycol Addition**

Viscosity Range SUS @ 100°F	Fluid to be Added	Gallons to be Added per 100 Gallons of FC Fluid-D
140 – 160	Concentrate	10
160 – 180	Concentrate	5
180 – 220	None	0
220 – 300	Water	5
300 – 350	Water	10
350 – 410	Water	15

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