



FR Hydraulic Fluid

Conoco FR Hydraulic Fluid is a fire-resistant, water-in-oil, invert-emulsion fluid for hydraulic systems, such as those found in underground mining equipment in which fire hazard and personnel safety concerns require water content for fire control. It is approved by the Mine, Safety, and Health Administration (MSHA) and the Factory Mutual Research Corporation (FMRC).

Applications

FR Hydraulic Fluid is premixed and ready to use. It contains 40 vol. % water in oil. The oil provides a continuous outer layer to protect the hydraulic system from rust, corrosion and wear. The water provides excellent fire resistance in case of leakage. Thus, FR Hydraulic Fluid offers an extra margin of safety when compared to conventional petroleum hydraulic oils.

FR Hydraulic Fluid is manufactured with high viscosity-index paraffinic base oils that are fortified with antiwear agents, biocides, rust and corrosion inhibitors and special emulsifiers that produce a stable, homogeneous mixture with a milky color. Proper system preparation is necessary if you are changing from a petroleum hydraulic oil or water-glycol fluid to FR Hydraulic Fluid. Avoid cork seals, as well as butyl seals and packing, because they tend to swell in service. Avoid filters and strainers on the pump inlet side of the system, as well as absorbent filters such as waste-packed or fuller's-earth units. Use paper filters only if the manufacturer can assure you that they are compatible with water-containing fluids.

To prevent excessive water loss, operate the system under 2000 psi pressure and do not allow temperatures to exceed 150°F (65°C). Most systems will run cooler with FR Hydraulic Fluid than with ordinary petroleum or synthetic fluids. The only special consideration is maintaining the proper water content, since water will be lost through evaporation. The MSHA requires a minimum of 40 vol. % water for adequate fire resistance.

**Fire-Resistant,
60/40, Oil/Water,
Invert-Emulsion
Fluid**

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Outstanding Features

- Resists fire
- Resists wear, rust and corrosion
- Cools hydraulic systems
- MSHA approved
- FMC approved

FR Hydraulic Fluid Typical Properties

| | |
|---------------------------------------|------------|
| ISO Grade | 100 |
| Composition, | |
| Oil (Volume %) | 60 |
| Water (Volume %) | 40 |
| Density, | |
| lb/gal | 7.68 |
| API Gravity | 22.0 |
| Specific Gravity @ 60°F (15.6°C) | 0.922 |
| Viscosity, | |
| cSt at 40°C | 103 |
| cSt at 100°C | 18.5 |
| SUS at 100°F | 477 |
| SUS at 210°F | 92 |
| Viscosity Index | 200 |
| Slush Point, | |
| °F | -2 |
| °C | -19 |
| Freeze Point, | |
| °F | -30 |
| °C | -34 |
| Pour Point, | |
| °F | -20 |
| °C | -29 |
| pH | 9.4 |
| Rust Test, A&B, ASTM D665 | Pass |
| Four-Ball Wear Test (mm) , ASTM D2266 | 0.55 |

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