

FR HFD 46 FM

Fire Resistant Hydraulic Fluid

Description

Fire Resistant HFD 46 FM was designed to replace anti-wear, mineral oil based hydraulic fluids as well as vegetable based fluids and polyol esthers. Fire Resistant HFD 46 FM is Factory Mutual approved (FM standard 6930 Group 1) and can be used in or near fire hazards and in environmentally sensitive hydraulic applications without compromising the overall hydraulic system operation. It is recommended for use in systems with a maximum operating temperature of 70°C (160°F), in combination with partial refreshment by system leakage.

Fire Resistant HFD 46 FM combines high-quality, natural esters and carefully selected additives to achieve excellent hydraulic fluid performance and deliver exceptional protection against wear to hydraulic pumps and system seals, equivalent to that of mineral-oil-based hydraulic fluids.

It does not contain water, mineral oil or phosphate ester and is bio-degradable (OECD-301 c), effectively eliminating the risk of environmental damage from leaks and spills should it leak into soil or groundwater and making it a perfect choice in environmentally sensitive hydraulic applications without compromising the overall hydraulic system operation.

Fire Resistant HFD 46 FM is used as received and pre-filtration is not necessary because it is heavily filtered during production. Its higher viscosity index compared with mineral oil makes it ideal for use at a wider temperature range with good cold start-up properties and higher viscosity at increased temperatures.

Fire Resistant HFD 46 FM is ideal for use in a wide variety of industrial applications including steel mills, foundries and die cast applications as well as heavy off-highway equipment including conveyor systems, excavators, compaction equipment, pumps, trenchers, cranes, hammers, hydraulic shovels, and crawler tractors.



Features/Benefits

- **Factory Mutual approved, can be used in or near fire hazards and its high fire point provides superior fire resistance**
- **Excellent lubrication properties yield exceptional protection against wear to pumps and seals**
- **Excellent shear stability assures viscosity and fire resistant properties are maintained during use**
- **Compatible with most standard seal materials**
- **Non-toxic and non-irritating, it contains no hazardous ingredients**

> 86.5% biodegradable (OECD-301 c) and with low aquatic toxicity, eliminates the risk of environmental damage from leaks and spills and can help reduce environmental charges associated with a plant's organic load in its waste stream

Low density compared to other HFD type fluids reduces pump strain and saves energy



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Rev. 1/2024



Compatibility

Metals

Fire Resistant HFD 46 FM is compatible with iron and steel alloys and most non-ferrous metals and their alloys. It is **not compatible with lead, cadmium, and alloys containing high levels of these metals.**

Components containing highly leaded alloys should be replaced with a suitable substitute.

Other Fluids

Fire Resistant HFD 46 FM is usually compatible with other HFD-U fluids and mineral oils. However, as with any major fluid conversion, we recommend that compatibility be tested. Fire Resistant HFD 46 FM is **not miscible with water or water-based fluids.**

Paints

Paint coatings inside the hydraulic equipment are usually not needed since Fire Resistant HFD 46 FM provides sufficient corrosion protection. Regardless, the product is compatible with multiple component epoxy systems. It is **not compatible with zinc-based coatings.**

Seals, Hoses and Packings

ISO 1629	Description	Static	Mild Dynamic	Dynamic
NBR	Medium to high nitrile rubber (Buna N, >30% acrylonitrile)	C	C	C
FPM	Fluorelastomer (Viton®)	C	C	C
CR	Neoprene	S	S	S
IIR	Butyl rubber	S	N	N
EPDM	Ethylene Propylene rubber	N	N	N
PU	Polyurethane	C	C	C
PTFE	Teflon®	C	C	C

Physical Properties

Properties	Results
Appearance	Yellow to Amber Fluid
Kinematic Viscosity (ASTM D 445)	
At 0°C	349 cSt
At 20°C	116 cSt
At 40°C	47.5 cSt
At 100°C	9.7 cSt
Viscosity Index (ASTM D 2270)	195
Density at 15°C (ASTM D 1298)	.92 g/cm ³
Acid Number (ASTM D 974)	2.0 mg KOH/g
Pour Point (ASTM D 97)	<-30°C/<-22°F
Foam Test at 25°C (ASTM D 892) Sequence I	50-0 ml-ml
Corrosion Protection	
ISO 4404-2	Pass
ASTM D 665A	Pass
ASTM D 130	1a
Dry TOST (ASTM D943 mod.)	800 hrs/min
Flash Point (ASTM D 92)	300°C/572°F
Fire Point (ASTM D 92)	360°C/680°F
Air Release (ASTM D 3427)	7 min
Demulsibility (ml-ml-ml (min.))	41-39-0 (30)
Auto Ignition Temperature	>400°C/>750°F
Fire Resistance (FM Approval)	Approved
Pump Test (ASTM D 2882)	<5 mg wear
Gear Lubrication (DIN 51354-2)	>12 FZG Load Stage
Specific Heat at 20°C	2.06 KJ/kg °C
Coefficient of Thermal Expansion at 20°C (D1903)	6 x 10 ⁻⁴ /°C