

MAK FRHF DU

Advanced high performance fire resistant hydraulic fluids

MAK FRHF DU fluids are advanced, fully synthetic less flammable hydraulic fluids. They are blended from polyol esters and high performance additives. These fluids are developed to provide good performance in conventional hydraulic systems and exhibit better fire resistance than mineral oils. They are biodegradable with low ecotoxicity. Excellent viscosity control enable them to operate over a wide range of working temperatures. They provide very high antiwear protection to the pump and its components. These fluids offer very good corrosion protection to the system components and are compatible with seal materials and paints normally specified for use in hydraulic systems with mineral oils except those made from natural rubber.

Grades: MAK FRHF DU range is available in the following ISO VG grades – **46** and **68**

Applications:

MAK FRHF DU range is recommended for hydraulic and fluid power transmission and control systems in very high temperature operating areas. They are suitable for use in metal, mining, power and glass industries. They can replace mineral hydraulic oils where good lubrication and protection against wear is required with higher resistance to fire hazards.

Performance/ Benefits:

Lower Flammability than Mineral Oils – helps hydraulic systems to operate under very high operating temperatures where mineral oils cannot perform. Reduces the possibility of fire hazards and offers safe working environment. They meet the spray ignition characteristics and flame propagation properties of the stringent IS 7895-1975 (Reaffirmed 2002). These fluids maintain lower flammability during their operating life and continue to offer protection.

Biodegradability and Low Ecotoxicity – readily biodegradable and not harmful to the environment. Does not contaminate or pollute the ecosystem.

Outstanding Viscosity/ Temperature Characteristics – excellent control over viscosity. Maintains viscosity under widely varying operating conditions and helps the equipment to perform to its design standards.

Excellent Wear Protection – excellent protection to the pump, valve and other system components even in wide range of load and temperature conditions.

Excellent Thermal Stability – provides resistance to thermal break down. Offers optimum life and performance in varied operating temperatures.

Increased System Reliability – by resisting thermal and chemical break down of the fluid the risk of formation of harmful sludge and deposit is minimised. Maintains hydrolytic stability.

Additional Benefits – superior viscosity index, air release value, corrosion protection and cleanliness. Maintains system efficiency through high pump pressures and efficient power transfer.

Specification:

- Classification HFDU according to ISO 6743-4
- ISO 12922 specifications for Fire Resistant Hydraulic Fluid – category HFDU
- IS 10532 (Part 5) – 2016
- IS 7895 – 1975 (for Fire Resistant Characteristics) (Reaffirmed 2013)

Storage & Handling:

The product should be stored inside. Keep it properly sealed to avoid contamination. Shelf life is 3 yrs. under protected storage conditions.

Health & Safety:

They are unlikely to be hazardous when properly used in recommended applications. Contamination of the fluid from other fluids/ oils, greases, chemicals, dirty water etc. can occur during the use. It should be avoided. Regular monitoring of the in-use product is recommended.

**Typical Physico-Chemical Data: MAK FRHF DU**

Characteristics	Method	46	68
Appearance	Visual	Clear & Bright	Clear & Bright
Density, g/cc @15°C	IP 365	0.9102	0.915
Kinematic Viscosity @40°C, cSt	ASTM D445	46.2	64.21
Kinematic Viscosity @100°C, cSt	ASTM D445	9.41	11.90
Viscosity Index	ASTM D2270	193	184
Flash Point, COC, °C	ASTM D92	310	314
Fire Point, COC, °C	ASTM D92	350	344
Acid Number, mg KOH/ g	ASTM D974	0.7	1
Air Release Value @50°C, minutes	ASTM D3427	6	6
Rust Preventive Characteristics	ASTM D665	Pass	Pass
Foaming Characteristics/ Stability, ml	ASTM D892		
Sequence I		10/NIL	10/NIL
Sequence II		10/NIL	110/NIL
Sequence III		10/NIL	30/NIL
Fire Resistant Characteristics	IS 7895	Passes A, B & C	Passes A, B & C