

RENOSAFE FireProtect 46

FM Approvals (Factory Mutual) Approved Fire Resistant Hydraulic Fluid MSHA Permissible Fire Resistant Hydraulic Fluid

Description

RENOSAFE FireProtect products are fire resistant hydraulic fluids based on special synthetic esters. The selected organic ester base oils have highest purity and show high oxidation and thermal stability. The properties of the fluids are improved by the addition of special selected zinc and ash-free additive systems. These zinc and ash-free additive systems are based on new additive technology which guarantees excellent copper compatibility, yellow metal compatibility, excellent hydrolytic stability and highest oxidation stability. They contain very effective robust and stable wear protection additives together with extreme pressure components. The RENOSAFE FireProtect products are non-toxic and physiologically harmless. The products of the RENOSAFE FireProtect series show in comparison to mineral based hydraulic fluids higher flammability temperature and higher self-ignition temperature. Special flammability tests according to ISO 12922 demonstrate that RENOSAFE FireProtect products reduce the risk of violent explosion or flammability when the fluids come in contact with open flames or hot metal surfaces (in comparison with mineral based products). These special flammability tests are in accordance to the ISO specification 12922, group HFDU - fire resistant fluids. The flammability risk is tested when the fluid or the pressurized fluid comes in contact with open flames and hot surfaces. The test results show a significant reduction of flammability risk by using RENOSAFE FireProtect products.

The RENOSAFE FireProtect products have a natural high shear stable viscosity index (multigrade characteristic). This high viscosity index is based on the physical property of the base fluid. The fluids do not contain viscosity index improver. They do not contain shear instable material. Therefore, the fluids have a high natural shear stability. Special additive systems which are selected according to the properties of the base fluids (organic esters) guarantee high oxidation and ageing stability. The RENOSAFE FireProtect products have excellent corrosion protection properties. They protect steel and non-iron metals from corrosion. The copper corrosion protection is guaranteed by the selection of a special copper/yellow metal passivator which gives protection over a wide application window. The anti-wear (AW) and the extreme pressure (EP) additives protect the hydraulic pumps and components against wear and against scuffing. The combination of selected additives in the fluid shows excellent low foaming and excellent air release properties. Entrained water can be separated easily. The products of the RENOSAFE FireProtect series are non-toxic, rapidly biodegradable (> 60% according to OECD 301 B) and can be seen as physiologically harmless, free of heavy metals. The RENOSAFE FireProtect series surpass all requirements according to ISO 12922 - dated 2011, group HFDU.

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Application

The RENOSAFE FireProtect products can be recommended as fire resistant hydraulic fluids - based on organic esters - type HFDU - for all hydraulic units, machines or plants operating in hazard conditions where open flames or high temperatures are present and a risk of fire caused by a fluid leakage is high. RENOSAFE FireProtect products reduce the flammability risk in comparison to mineral oil. The RENOSAFE FireProtect products have in comparison to mineral oil a higher flammability characteristic and higher ignition temperature, which reduce the risk of fire by leakage of the pressure fluids.

Typical application: steel mill, blast furnaces, continuous casting machines, coke plants, mining application, mobile and stationary hydraulic units, injection moulding machines.

The products of the RENOSAFE FireProtect series guarantee a rapid biodegradability and reduce the environmental risk potential.

The products are in general miscible and compatible with conventional hydraulic fluids based on mineral oils. In general the compatibility of mineral based fluids and HFDU types can be examined according to the special FUCHS in-house compatibility procedure. A change to RENOSAFE FireProtect fluids is possible at any time. Please contact FUCHS for technical assistance.

The compatibility with seal materials, e.g., NBR, Viton, silicon seals is good whereas the use of neoprene, ethylene or propylene seals is not recommended. Before filling the hydraulic circuit with RENOSAFE FireProtect products, it is important to understand miscibility with the prior fluid and seal compatibility. It is recommended to pre-check the behaviour of hydraulic fluids of the RENOSAFE FireProtect series in a mix with mineral oils and other ester based fluids in a laboratory test. Contamination with water, steam should be avoided (please check the air filter of the circuit, bypass filter systems, water separators etc.). Recommended tank temperatures: 70 - 90 °C. The lower the temperature, the longer the lifetime of the fluid. It is recommended that the continuous temperature should be 70 °C or lower. Temperatures of 90 °C or higher are tolerable for a short period of time. Periodic analysis of the used product is recommended. The Fuchs technical team will advise the on the best suggestions according to the test results.

Used oil analysis:

Examination of viscosity, neutralization number, purity class, water content, IR spectrum, wear ICP metals, contamination of ICP elements, additive content.

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Advantages

- FM Approvals (Factory Mutual) Approved Industrial Fluid
- MSHA Permissible Fire-Resistant Hydraulic Fluid
- Excellent yellow metal compatibility, excellent corrosion protection
- Long service life
- Excellent resistance to ageing and oxidation
- Non-toxic, physiologically harmless, free of heavy metals
- High shear stable viscosity index - multigrade characteristics
- Rapid air release, low foaming behaviour
- Excellent wear protection properties, high scuffing load characteristics
- Rapid biodegradability (> 60% according to OECD 301 B)

Specifications

- FM Approvals (Factory Mutual) Approved Industrial Fluid - Flammability Classification of Industrial Fluids – Class Number 6930 – Approval Identification: 3051209
- MSHA Permissible Fire-Resistant Hydraulic Fluid Approval Number 35-A150002
- RENOSAFE FireProtect HFDR fluid according to DIN 51502, based on synthetic, organic esters.
- Fulfills HLP requirements (with the exception of the TOST properties)
- HEE46 ISO 15380 hydraulic fluid based on synthetic ester
- HFDR according to ISO 12922

General recommendations for changing hydraulic units to RENOSAFE FireProtect

1. Change from mineral oil to RENOSAFE FireProtect

Miscibility with old fluid and seal compatibility should be checked according to the FUCHS in-house test. In general RENOSAFE FireProtect is miscible with mineral based hydraulic oils, type HLP, HM, HLPD. The system should be drained off, the tank should be cleaned, filter changed, flushing and cleaning of the system is recommended for optimal performance.

2. Change from phosphate ester to RENOSAFE FireProtect

RENOSAFE FireProtect is miscible and compatible with most of the available HFDR products. Check the miscibility with the old fluid according to the FUCHS in-house test. Compatibility of elastomers and seal material and hoses should be checked. Cleaning of the tank, change of the filters, flushing of the system is recommended.

3. Change of water containing HFC fluids (water glycol) to RENOSAFE FireProtect

Please contact our application engineers.

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Product name		46	
Properties	Unit		Test method
Appearance		clear, yellowish	
Colour	ASTM	1.0	DIN ISO 2049
Viscosity at 0 °C	mm ² /s	309.5	DIN EN ISO 3104
40 °C	mm ² /s	50.0	
60 °C	mm ² /s	26.5	
100 °C	mm ² /s	10.4	
Viscosity index	-	203	DIN ISO 2909
Density at 15 °C	kg/m ³	920	DIN 51757
Pourpoint, P.P.	°C	- 42	DIN ISO 3016
Neutralization number, NZ	mgKOH/g	0.8	DIN 51558
Foaming behaviour, Seq. I II III			
24 °C at once/after 10 min	ml	0 / 0	ASTM D 892
93.5 °C at once/after 10 min	ml	30 / 0	ASTM D 892
24 °C to 93,5 °C at once/after 10 min	ml	0 / 0	ASTM D 892
Dry TOST test			
Oxidation stability (95 °C), (ΔNZ = 2 mgKOH/g)	hours	> 450	DIN ISO 4263-3
Demulsifying characteristic	minutes	< 30	DIN ISO 6614
Corrosion protection - steel,			
Method A (24 h at 60 °C)	degree of corrosion	0-A	DIN ISO 7120
Method B (24 h at 60 °C)		0-B	
Corrosion protection - copper (3 h at 100 °C)	degree of corrosion	1a	DIN EN ISO 2160
Corrosion test 35 °C / 28 d		passed	DIN EN ISO 4404-2

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Inflammability characteristics			
Product name		46	
Properties	Unit		Test method
Flash point in open cup according to Cleveland	°C	270	DIN ISO 2592
Fire point	°C	364	ASTM D 92
Spray ignition test (DMT Test Report)	--	passed < 5 sec	DIN EN ISO 15 029-1
Hot surface ignition test (> 400 °C)	--	passed no ignition	DIN EN ISO 20823

Tribological characteristics			
Product name		46	
Properties	Unit		Test method
Four ball test - wear	mg	0.3	ASTM D 4172
FZG mechanical gear test rig FZG A/8.3/90	failure load stage	> 12	DIN ISO 14635-1
Vickers vane pump test, weight loss ring 250 h test	mg	< 1	DIN ISO 20763
vanes 250 h test	mg	< 1	

PRODUCT INFORMATION



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We therefore recommend you consult a FUCHS Lubricants Co. Application Engineer to discuss application conditions and the performance criteria of the products before the product is used. It is the responsibility of the user to test the functional suitability of the product and to use it with the corresponding care.

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