

RENOLIN ZAF D HT Series

Universal zinc and ash-free hydraulic fluid and industry gear oil, deterging, excellent stability, high wear protection

Description

The new development of RENOLIN ZAF D HT Series is focussed on high-thermal and oxidative stability in combination with excellent wear protection properties. New zinc and ash-free additive technology in combination with selected mineral base oils (solvent neutral) guarantees excellent hydraulic performance as well as gear oil properties.

The new development of these products is focussed on new sulphur phosphorous additive technology. This P/S technology combined with selected antioxidant and corrosion protection additives guarantees an extraordinarily robust performance and wear protection. The products of the RENOLIN ZAF D HT Series (HT = high temperature stability) guarantee excellent wear protection in hydraulic pumps and hydraulic motors (the Vickers Vane pump performance test is passed with excellent low wear rates, the wear of the ring and vanes in the Vane Pump Test are significantly lower compared to conventionally zinc and ash-free phosphorous sulphur formulations). The RENOLIN ZAF D HT Series guarantees excellent copper and yellow metal corrosion protection. The corrosion protection in standard test conditions as well as in wet test conditions shows very good result. The copper and yellow metal test coupons are protected also under the influence of high humidity/water. Additionally, the products of the RENOLIN ZAF D HT Series provide high deterging and dispersing properties.

The RENOLIN ZAF D HT products have passed the relevant industrial gear oil wear tests (according to DIN 51517, part 3) with good results. Especially the wear protection in the FZG test (FZGA/8.3/90) is passed with a failure load stage > 12 which is an

Advantages

- **Universal hydraulic and gear oil**
- **Excellent pump wear protection**
- **Excellent scuffing wear protection**
- **Excellent roller bearing wear protection**
- **High oxidative and thermal stability, good ageing stability**
- **Excellent hydrolysis stability**
- **High corrosion protection, also in the presence of humidity and water**
- **Excellent yellow metal corrosion protection, also in the presence of humidity and water**
- **Good air release and low foaming behaviour**
- **Excellent behaviour to sealing material**
- **Zinc and ash-free (free of heavy metal)**
- **Latest phosphorous/sulphur additive technology**
- **High deterging and dispersing power**

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excellent result. The formulation shows also excellent wear protection of roller bearing in the roller bearing wear test. The relevant test in the FAG/FE8roller bearing wear test at 7.5 rpm/80 °C at an axial load of 80 KN is passed with extremely low wear rates.

In the summary all relevant performance criteria of industrial gear oils are passed and surpassed.

The RENOLIN ZAF D HT products surpass the requirements for hydraulic fluids (according to DIN 51524, part 2) and industrial gear oils (DIN 51517, part 3).

The products are universally applicable, the formulation is robust. The products have high oxidation and stability, also under the influence and in the presence of humidity and water. The development of the RENOLIN ZAF D HT Series is also focussed on excellent yellow metal compatibility. In different laboratory tests bronze material, copper/zinc-containing alloys are tested at high temperature over a long test period in dry and wet conditions. The property of the oil, the corrosiveness of the metal surface is determined. After the test, the content of dissolved metals in the oil phase is measured.

The RENOLIN ZAF D HT products show excellent corrosion protection results, no copper, zinc metals are dissolved in the oil phase, also under severe test conditions.

The RENOLIN ZAF D HT products guarantee, therefore, excellent corrosion protection of yellow metal materials which are used in pumps, hydraulic motors, hydraulic pistons and bearings.

The oxidation stability, also in the presence of catalytically acting copper and iron and yellow metal materials, is high. The test shows at high temperatures the robustness of the formulations. The products are stable under severe conditions, sludge is reduced, carbon residues on metal surfaces can be reduced.

Application

The products of the RENOLIN ZAF D HT Series are high-performance robust hydraulic oils as well as lubricating oils. The products can also be used as industrial gear oils. RENOLIN ZAF D HT products are universal oils and can be used for various applications as hydraulic oils (HLP-D) as well as industrial gear oils (CLP, CLP-D). The RENOLIN ZAF-D HT Series is recommended as deterging hydraulic, gear and lubricating oil in hydraulic equipments, in presses and tool machines. RENOLIN ZAF D HT products can be used in stationary and mobile hydraulic systems.

Specifications

The oils of the RENOLIN ZAF D HT Series pass and surpass the requirements according to

- DIN 51524-2: HLPD
- ISO 6743-4: HM
- DIN 51517-3: CLP, CLP-D
- ISO 6743-6: CKC
- DBL 6713-HLP (with the exception of the demulsibility)

Approvals

Medical Device Services, test report May 2020:
Cytotoxicity: EN ISO 10993-1, EN ISO 10993-5,
EN ISO 10993-12 (Cytotoxicity test – no effect)

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Typical data:

Product name	RENOLIN ZAF					
Properties	Unit	D 22 HT	D 32 HT	D 46 HT	D 68 HT	Test method
ISO VG		22	32	46	68	
Kinematic viscosity						DIN EN ISO 3104
at 0 °C	mm ² /s	180	339	562	986	
at 40 °C	mm ² /s	22	32	46	68	
at 100 °C	mm ² /s	4.3	5.3	6.8	8.8	
Viscosity index	---	103	97	100	100	DIN ISO 2909
Density at 15 °C	kg/m ³	860	870	880	880	DIN 51757
Colour	ASTM	0.5	1.0	1.5	2.0	DIN ISO 2049
Flash point (Cleveland)	°C	206	220	230	> 230	DIN ISO 2592
Pourpoint	°C	-33	-33	-27	-27	DIN ISO 3016
Neutralisation number	mgKOH/g	0.2	0.2	0.2	0.2	DIN ISO 6618
Air release at 50 °C	min	2	4	6	9	DIN ISO 9120
Copper corrosion	degr. of corr.	1-100A24	1-100A24	1-100A24	1-100A24	DIN EN ISO 2160
Corrosion protection steel						DIN ISO 7120
- method A: distilled water	degree of corrosion	0-A	0-A	0-A	0-A	
- method B: salt water		0-B	0-B	0-B	0-B	
Testing in mixed friction area acc. to Brugger	N/mm ²	≥ 30	≥ 30	≥ 30	≥ 30	DIN 51347-2
Scuffing protection FZG A/8.3/90	failure load stage	12	> 12	>12	> 12	DIN ISO 14635-1
FE8 wear test, D-7.5/80 KN/80 °C/80 h						DIN 51819-3
- roller bearing wear	mg wear			< 30		
- cage wear	mg wear			< 200		

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Typical data (continued):

Product name		RENOLIN ZAF				
Properties	Unit	D 22 HT	D 32 HT	D 46 HT	D 68 HT	Test method
Vickers Vane pump test, V104 C;						DIN 51389-2
- ring wear	mg wear			5		
- vane wear	mg wear			7		
Yellow metal compatibility (bronze, CU-Zn alloy)	-	← no Cu/Zn in the oil →				FUCHS Inhouse-Test
Temp. 100 °C, duration 168 h: content of dissolved metal in the oil -		no metal in the oil, also under influence of water				FUCHS Inhouse-Test

Produktinformation

MOVING YOUR WORLD



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