

RENOLIN ZAF B PLUS LOW VISCOSITY SERIES

Highly Aging Resistant, Zinc and Ash Free Spindle Oil and Hydraulic Fluids

Description

RENOLIN ZAF B HT PLUS Low Viscosity Series was developed for use in rotating spindles of machine tools or grinding machines. These are zinc- and ash-free spindle oils based on select mineral oils together with additives to improve the lubricating properties, aging stability and corrosion protection.

The development of these products is focused on new phosphorous sulphur additive technology. This P/S technology combined with select antioxidant and corrosion protection additives provide extraordinarily robust performance and wear protection. The additive system used in the RENOLIN ZAF B HT PLUS Low Viscosity Series (HT = high temperature stability) provides excellent wear protection in spindles and also in hydraulic pumps and motors.

The products are universally applicable, the formulation is robust. The products have high oxidation resistance and stability, even in the presence of water. The development of the RENOLIN ZAF B HT PLUS Series is also focused on excellent yellow metal compatibility. In the laboratory copper/zinc-containing alloys are tested at high temperature over a long test period in dry and wet conditions. The properties of the oil and the corrosion of the metal surfaces are then determined. In particular the content of dissolved metal in the oil phase is measured.

The RENOLIN ZAF B HT PLUS Low Viscosity Series products show excellent corrosion protection results, with no copper or zinc metals dissolved in the oil phase, even under these severe test conditions.

The RENOLIN ZAF B HT PLUS Low Viscosity Series products therefore provide excellent corrosion protection of yellow metal materials which are used in pumps, hydraulic motors, hydraulic pistons and bearings.

The oxidation stability is high, even in the presence of catalytically acting copper and iron and yellow metals. The testing shows the high temperatures robustness of the formulations.

The products are stable under severe conditions, sludge is reduced, and carbon residues on metal surfaces are also reduced.

The RENOLIN ZAF B HT PLUS Low Viscosity Series products VG 5 and higher surpass the requirements for hydraulic fluids (according to DIN 51524, part 2 - HLP). Especially the wear protection in the FZG test (FZG A/8.3/90) is passed with a failure load stage ≥ 10 for VG 5 and higher which is an excellent result.

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Application

The products of the RENOLIN ZAF B HT PLUS Low Viscosity Series are high-performance robust spindle oils as well as anti-wear (HLP) hydraulic oils in VG 5 and higher. The VG 2 product is recommended for spindle bearings which operate with extremely tight tolerances.

Advantages

- Excellent scuffing wear protection
- Excellent roller bearing wear protection
- High oxidative and thermal stability, good ageing stability
- Excellent hydrolysis stability
- High rust and corrosion protection of steel surfaces even in the presence of water
- Excellent yellow metal corrosion protection, even in the presence of water
- Good air release and low foaming behaviour
- Excellent seal compatibility
- Zinc and ash-free (free of heavy metal)
- Latest phosphorous/sulphur additive technology

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Product name		RENOLIN ZAF B HT PLUS					Test method
Properties	Unit	B 2 HT	B 5 HT	B 10 HT	B 15 HT	B 22 HT	
ISO VG		2	5	10	15	22	
Kinematic viscosity							
at 40 °C	mm ² /s	2.2	4.6	10	15	22	ASTM D 445
at 100 °C	mm ² /s	—	1.6	2.7	3.4	4.3	
Viscosity index	---	—	114	103	102	100	ASTM D 2270
Density at 15 °C	kg/m ³	820	817	840	845	852	ASTM D 4052
Color index	ASTM	<0.5	<0.5	<0.5	<0.5	0.5	ASTM D 1500
Flash point (COC)	°C	93	136	186	200	214	ASTM D 92
Pour point	°C	- 71	- 51	- 45	- 30	- 24	ASTM D 97
Neutralization number	mgKOH/g	0.2	0.2	0.2	0.2	0.2	ASTM D 974
Air release at 50 °C	min	-	< 1	1	2	2	ASTM D 3427
Copper corrosion	corr. degree	-	1-100 A 3	1-100 A 3	1-100 A 3	1-100 A 3	ASTM D 130
Corrosion protection - steel							
- Method A: distilled water	corrosion	-	0	0	0	0	ASTM D 665
- Method B: salt water	degree	-	0	0	0	0	

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ISO VG		2	5	10	15	22	
Testing in mixed friction area acc. to Brugger	N/mm²	-	≥ 30	≥ 30	≥ 30	≥ 30	DIN 51 347-2
Scuffing protection FZG A/8.3/90	Failure load stage	-	≥ 10	≥10	≥10	≥ 12	DIN ISO 14635-1
FE8 wear test, D-7.5/80 kN/80 °C/80 h		pass excellent					DIN 51 819-3
Roller bearing wear	mg wear	ISO VG 46: 0.5 mg*					
Cage wear	mg wear	ISO VG 46: 94 mg*					
Vickers Vane Pump Test, V104 C; total wear	mg wear			pass excellent ISO VG 46: 10 mg*			ASTM D 2882
Yellow metal compatibility (bronze, Cu-Zn alloy)							FUCHS In house-Test (ASTM D 130 modified)
temp. 100 °C, duration 168 h:	-	no Cu in the oil					
content of dissolved metal in the oil	-	no zinc in the oil					
		(in dry and humid environments)					

* Testing conducted on ISO VG 46 to demonstrate additive system performance in typical hydraulic VG grade

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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