

RENOLIN ZAF B HT PLUS SERIES

Universal Zinc and Ash Free Hydraulics Fluids, Industrial Gear and Circulating Oils

Description

The latest developments to the RENOLIN ZAF B HT PLUS Series are focused on high thermal and oxidation stability combined with excellent wear and corrosion protection properties even in the presence of water. New zinc and ash-free additive technology used in combination with select hydrocracked base oils provides excellent hydraulic performance as well as gear oil performance.

These newest developments of this series of products are focused on new phosphorous sulphur additive technology. This P/S technology combined with special antioxidant and corrosion protection additives ensure extraordinarily robust performance and wear protection. The products of the RENOLIN ZAF B HT PLUS Series (HT = high temperature stability) provide excellent wear protection in hydraulic pumps and hydraulic motors. The Vickers Vane pump performance test is passed with excellent low wear rates and the wear of the ring and vanes are significantly lower when compared to conventional zinc and ash-free formulations. The RENOLIN ZAF B HT PLUS Series provides exceptional copper and yellow metal corrosion protection. Excellent corrosion protection under standard test conditions as well as under wet conditions is demonstrated. This means that copper and yellow metals are protected against the effects of high humidity or water ingress.

The RENOLIN ZAF B HT PLUS products have passed the relevant industrial gear oil wear tests according to DIN 51517-3 (CLP). Especially the wear protection requirement in the FZG test (A/8.3/90) is passed with a failure load stage ≥ 12 in ISO VG 22 and higher grades which is an excellent result. The formulation also provides excellent roller bearing wear protection. Extremely low wear rates were achieved on ISO VG 46 in the FAG FE8 roller bearing wear test at 7.5 rpm and 80 °C with an axial load of 80 kN.

The RENOLIN ZAF B HT PLUS Series products pass or surpass all relevant requirements for hydraulic fluids according to DIN 51524-2 (HLP) and industrial gear oils (DIN 51517-3 (CLP)). The products are therefore virtually universally applicable.

The development focus of the RENOLIN ZAF B HT PLUS Series also included excellent yellow metal compatibility. In laboratory testing copper-containing alloys are tested at high temperature over long duration in dry and wet conditions and the products demonstrated excellent corrosion protection results.

This means the products will provide excellent corrosion protection to yellow metal components in hydraulic pumps, motors and pistons and also roller bearings.

The oxidation stability, also in the presence of catalytically acting copper and iron, is high. Testing shows the high temperature robustness of the formulations. The products are stable under these severe conditions, sludge is reduced, and carbon residue on metal surfaces is reduced.

RENOLIN ZAF B HT PLUS SERIES

Universal Zinc and Ash Free Hydraulics Fluids, Industrial Gear and Circulating Oils

Application

The products of the RENOLIN ZAF B HT PLUS Series are high-performance robust hydraulic oils as well as circulating oils. The products can also be used as industrial gear oils. RENOLIN ZAF B HT PLUS products are universal-type oils and can be used for various applications as hydraulic oils (HLP) as well as industrial gear oils (CLP). The RENOLIN ZAF-B HT PLUS Series is recommended for application in hydraulic-driven components, presses and machine tools as a demulsifying hydraulic fluid in stationary and mobile hydraulic systems. Also recommend as general purpose industrial gear oils, circulating oils and spindle oils.

Specifications

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

- DIN 51524-2: HLP
- ISO 6743-4: HM
- DIN 51517-3: CLP
- ISO 6743-6: CKC
- DBL 6713-HLP

Advantages

- Universal AW hydraulic and EP 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 steel 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 behavior
- Excellent behavior to seal materials
- Zinc and ash-free (free of heavy metal)
- Latest phosphorous/sulphur additive technology

RENOLIN ZAF B HT PLUS SERIES

Universal Zinc and Ash Free Hydraulics Fluids, Industrial Gear and Circulating Oils

Product name	RENOLIN ZAF B HT PLUS					
Properties	Unit	B 10 HT	B 15 HT	B 22 HT	B 32 HT	Test method
ISO VG		10	15	22	32	
Kinematic viscosity						
at 40 °C	mm ² /s	10	15	22	32	ASTM D 445
at 100 °C	mm ² /s	2.7	3.4	4.3	5.5	
Viscosity index	---	103	102	100	110	ASTM D 2270
Density at 15 °C	kg/m ³	840	845	852	857	ASTM D 4052
Color index	ASTM	<0.5	<0.5	0.5	0.5	ASTM D 1500
Flash point (COC)	°C	186	200	214	210	ASTM D 92
Pour point	°C	- 45	- 30	- 24	- 21	ASTM D 97
Neutralization number	mgKOH/g	0.2	0.2	0.2	0.2	ASTM D 974
Air release at 50 °C	min	1	2	2	3	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 - Method B: salt water	Corrosion degree	0 0	0 0	0 0	0 0	ASTM D 665
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	≥ 10	≥ 10	≥12	≥12	DIN ISO 14635-1
FE8 wear test, D-7.5/80 KN/80 °C/80 h Roller bearing wear Cage wear	mg wear mg wear		pass excellent ISO VG 46: 0,5 mg ISO VG 46: 94 mg			DIN 51819-3
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) temp. 100 °C, duration 168 h: content of dissolved metal in the oil	- -		no Cu in the oil no zinc in the oil (in dry and humid environments)			FUCHS Inhouse- Test (ASTM D 130 modified)
TOST Lifetime (type value)	h	> 6,000	> 6,000	> 6,000	> 6,000	ASTM D 943

PRODUCT INFORMATION



Product name		RENOLIN ZAF B HT PLUS				
Properties	Unit	B 46 HT	B 68 HT	B 100 HT	Test method	
ISO VG		46	68	100		
Kinematic viscosity						
at 40 °C	mm ² /s	46	68	100	ASTM D 445	
at 100 °C	mm ² /s	7.0	9.1	11.6		
Viscosity index	---	110	109	104	ASTM D 2270	
Density at 15 °C	kg/m ³	860	870	870	ASTM D 4052	
Color index	ASTM	0.5	0.5	0.5	ASTM D 1500	
Flash point (COC)	°C	244	251	262	ASTM D 92	
Pour point	°C	- 21	- 30	- 30	ASTM D 97	
Neutralization number	mgKOH/g	0.2	0.2	0.2	ASTM D 974	
Air release at 50 °C	min	4	5	4 (75 °C)	ASTM D 3427	
Copper corrosion	corr.degree	1-100 A 24	1-100 A 24	1-100 A 24	ASTM D 130	
Corrosion protection – steel - Method A: distilled water - Method B: salt water	Corrosion degree	0 0	0 0	0 0	ASTM D 665	
Testing in mixed friction area acc. to Brugger	N/mm ²	35	35	35	DIN 51347-2	
Scuffing protection FZG A/8.3/90	Failure load stage	≥12	≥12	≥12	DIN ISO 14635-1	
FE8 wear test, D-7.5/80 KN/80 °C/80 h Roller bearing wear Cage wear	mg wear mg wear		pass excellent ISO VG 46: 0,5 mg ISO VG 46: 94 mg		DIN 51819-3	
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) temp. 100 °C, duration 168 h: content of dissolved metal in the oil	- -		no Cu in the oil no zinc in the oil (in dry and humid environments)		FUCHS Inhouse- Test (ASTM D 130 modified)	
TOST Lifetime (type value)	h	> 6,000	> 6,000	> 6,000	ASTM D 943	

PRODUCT INFORMATION



The information contained in this brochure is based on the experience and know-how of FUCHS Lubricants Co. in the development and manufacturing of lubricants and represents the current state-of-the-art. The performance of our products can be influenced by a series of factors, especially the specific use, the method of application, the operational environment, component pre-treatment, possible external contamination, etc. For this reason, universally-valid statements about the function of our products are not possible. The information given in this Product Information sheet represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application.

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.

Our products undergo continuous improvement. We therefore retain the right to change our product program, the products, and their manufacturing processes as well as all details of our Product Information sheets at any time and without warning. With the publication of this Product Information sheet, all previous editions cease to be valid.

ANY FORM OF REPRODUCTIONS REQUIRES EXPRESS PRIOR WRITTEN PERMISSION FROM FUCHS LUBRICANTS CO.

© FUCHS Lubricants Co. All rights reserved.