RENOLIN CLP

Heavy Duty EP – High Performance Industrial Gear Oils

Description

The RENOLIN CLP products are industrial gear oils of the latest generation, having outstanding extreme pressure characteristics (EP/AW properties) and an extremely high load carrying capacity. They are industrial gear oils with excellent demulsifying properties which can be used in all types of enclosed gear drives with circulation or splash lubrication systems. The RENOLIN CLP products offer extraordinary wear protection. They surpass the requirements in the standard FZG A/8.3/90 scuffing test as well as the more severe FZG test A/16.6/140 (double velocity - 16.6 m/s - and increased starting oil sump temperature - 140 °C). The RENOLIN CLP products provide extremely high micropitting protection (load stage “high” in the load stage test as well as the endurance test). They offer excellent wear protection for roller bearings. The wear rates in the FAG FE8 test are extremely low under these extreme test conditions (7.5 rpm, 80 kN, 80 °C, 80h).

Latest additive technology guarantees excellent wear protection and excellent corrosion protection (steel and copper-containing materials) The RENOLIN CLP products have good elastomer compatibility, stressed static and dynamic elastomers are lubricated and protected from wear. The lifetime of the components is increased. RENOLIN CLP oils can improve equipment reliability and increase productivity.

Advantages/Benefits

- Excellent corrosion protection
- Low foaming, excellent air release
- Excellent demulsifying properties (water and water-containing fluids are separated fast)
- High oxidation resistance
- Extremely high load-carrying capacity, extreme pressure-, anti-wear performance
- Excellent bearing wear protection (under mixed friction conditions) – FE8
- Excellent protection from scuffing, excellent wear protection - FZG
- Excellent micropitting resistance in the FZG load stage and endurance test
- High Brugger wear protection
- Excellent elastomer compatibility (static and dynamic)
- Good compatibility with paint materials

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Application

The RENOLIN CLP oils are recommended for industrial spur-, helical- and bevel enclosed gears with circulation or splash lubrication, operating at oil temperatures up to 100 °C and peaks above up to 120 °C. The RENOLIN CLP oils can be used for all applications where lubricants of the CLP type according to DIN 51517-3 are recommended by the gear manufacturer. These products meet, and in many cases exceed the latest requirements of well-known international gearbox and bearing manufacturers. The RENOLIN CLP oils are particularly suited for gear sets working under heavy load or shock load. They also can be used in non-gear applications including highly loaded, low-speed plain and rolling contact bearings. These mineral oil-based products are de- signed to provide the highest quality and latest additive technology available in an industrial gear oil formulation. They meet the latest industrial standards of well-known OEMs. RENOLIN CLP is approved or meets the performance requirements of Siemens Flender.

Specifications

The RENOLIN CLP oils meet, and in many cases exceed the requirements:

- DIN 51517-3: CLP
- ISO 6743-6 and ISO 12925-1: CKC / CKD
- AGMA 9005/E02:
- EP AIST 224
- David Brown S1 53.101

The products of the RENOLIN CLP series are approved or meet the critical performance requirements of the following OEM:

- Siemens/Flender, Bocholt, Germany, Flender BA 7300, table A David Brown S1 53.101
- Müller Weingarten AG, Germany DT 55 005

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Product name		RENOLIN CLP				
Properties	**Unit**	**68**	**100**	**150**	**220**	**Test method**
ISO VG	-	68	100	150	220	DIN 51519
Kinematic Viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 68 8.7	 100 11.2	 150 14.5	 220 18.9	DIN EN ISO 3104
Viscosity Index	-	99	98	96	96	DIN ISO 2909
Density at 15 °C	kg/m³	886	890	894	896	DIN 51757
Color index	ASTM	1.0	1.5	3.0	3.5	DIN ISO 2049
Flash point	°C	236	240	250	260	DIN ISO 2592
Pour point	°C	- 24	- 21	- 24	- 24	DIN ISO 3016
Neutralization number	mgKOH/g	0.6	0.6	0.6	0.6	DIN 51558-1
Demulsibility at 54 °C	min.	10	-	-	-	DIN ISO 6614
Demulsibility at 82 °C	min.	-	10	15	15	DIN ISO 6614
Copper corrosion 3 h, 100 °C (100 A3)	Degree of corrosion	 1	 1	 1	 1	DIN EN ISO 2160
Corrosion protection – steel procedure A: dist. water procedure B: sea water	 Degree of corrosion	 0 0	 0 0	 0 0	 0 0	DIN ISO 7120
Foaming Seq. I Seq. II Seq. III	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	ASTM D 892

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Product name		RENOLIN CLP				
Properties	**Unit**	**68**	**100**	**150**	**220**	**Test method**
FZG A/8.3/90 gear test rig Start temperature: 90 °C	failure load stage	> 12	> 12	> 12	> 14	DIN ISO 14635-1
FZG A/16.6/140 gear test rig Start temperature: 140 °C	failure load stage	> 12	> 12	> 12	> 12	DIN ISO 14635-1
FZG-GFT* test GT-C/8.3/90 Load stage test	GF Class	GFT high	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FZG-GFT* test GT-C/8.3/90 Endurance test	GF Class	GFT high	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FE8 wear test, D7.5/80-80 Roller wear	mg	< 5	< 5	< 5	< 5	DIN 51819-3
Testing in mixed friction area according to Brugger	N/mm²	≥ 50	≥ 50	≥ 50	≥ 50	DIN 51347-2
Timken OK load	lbs	85	95	95	95	ASTM D 2782
4-Ball EP test	N	≥ 2400				DIN 51350-2
Weld load	kg	≥ 250				ASTM D 2783-88
Elastomer compatibility - dynamic and static: • 72NBR902 (1000 h, 80 °C – dynamic) • 75FPM585 (1000 h, 90 °C – dynamic) • 75FKM17055 (1000 h, 90 °C – dynamic) • SRE-NBR 28/SX according to DIN ISO 13226 (100 °C, 7 d – static)				pass pass pass pass		Fuchs In-house Test according to DIN ISO 1817 and according to Flender DIN ISO 1817

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Product name		RENOLIN CLP			
Properties	**Unit**	**320**	**460**	**680**	**Test method**
ISO VG	-	320	460	680	DIN 51519
Kinematic Viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 320 24	 460 30.4	 680 39.7	DIN EN ISO 3104
Viscosity Index	-	95	95	95	DIN ISO 2909
Density at 15 °C	kg/m³	900	905	910	DIN 51757
Color index	ASTM	4.5	5.5	5.0	DIN ISO 2049
Flash point	°C	255	270	270	DIN ISO 2592
Pour point	°C	- 12	- 12	- 10	DIN ISO 3016
Neutralization number	mgKOH/g	0.6	0.6	0.6	DIN 51558-1
Demulsibility at 54 °C	min.	-	-	-	DIN ISO 6614
Demulsibility at 82 °C	min.	20	25	30	DIN ISO 6614
Copper corrosion 3 h, 100 °C (100 A3)	Degree of corrosion	1	1	1	DIN EN ISO 2160
Corrosion protection – steel procedure A: dist. water procedure B: sea water	 Degree of corrosion	 0 0	 0 0	 0 0	DIN ISO 7120
Foaming Seq. I Seq. II Seq. III	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	ASTM D 892

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Product name		RENOLIN CLP			
Properties	**Unit**	**320**	**460**	**680**	**Test method**
FZG A/8.3/90 gear test rig Start temperature: 90 °C	failure load stage	> 14	> 14	> 14	DIN ISO 14635-1
FZG A/16.6/140 gear test rig Start temperature: 140 °C	failure load stage	> 12	> 12	> 12	DIN ISO 14635-1
FZG-GFT* test GT-C/8.3/90 Load stage test	GF Class	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FZG-GFT* test GT-C/8.3/90 Endurance test	GF Class	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FE8 wear test, D7.5/80-80, Roller wear	mg	< 5	< 5	< 5	DIN 51819-3
Testing in mixed friction area according to Brugger	N/mm²	≥ 50	≥ 50	≥ 50	DIN 51347-2
Timken OK load	lbs	95	95	95	ASTM D 2782
4-Ball EP test	N		≥ 2400		DIN 51350-2
Weld load	kg		≥ 250		ASTM D 2783-88
Elastomer compatibility - dynamic and static: • 72NBR902 (1000 h, 80 °C – dynamic) • 75FPM585 (1000 h, 90 °C – dynamic) • 75FKM17055 (1000 h, 90 °C – dynamic) • SRE-NBR 28/SX according to DIN ISO 13226 (100 °C, 7 d – static)			 pass pass pass pass		Fuchs Inhouse Test according to DIN ISO 1817 and according to Flender DIN ISO 1817

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Product name		RENOLIN CLP		
Properties	**Unit**	**1000**	**1500**	**Test method**
ISO VG	-			DIN 51519
Kinematic Viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 1000 50.2	 1500 64.6	DIN EN ISO 3104
Viscosity Index	-	95	95	DIN ISO 2909
Density at 15 °C	kg/m³	915	920	DIN 51757
Color index	ASTM	4.5	4.0	DIN ISO 2049
Flash point	°C	280	280	DIN ISO 2592
Pour point	°C	-5	-5	DIN ISO 3016
Neutralization number	mgKOH/g	0.6	0.6	DIN 51558-1
Demulsibility at 54 °C	min.	-	-	DIN ISO 6614
Demulsibility at 82 °C	min.	30	30	DIN ISO 6614
Copper corrosion 3 h, 100 °C (100 A3)	Degree of corrosion	1	1	DIN EN ISO 2160
Corrosion protection – steel procedure A: dist. water procedure B: sea water	 Degree of corrosion	 0 0	 0 0	DIN ISO 7120
Foaming Seq. I Seq. II Seq. III	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	ASTM D 892

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Product name		RENOLIN CLP		
Properties	**Unit**	**1000**	**1500**	**Test method**
FZG A/8.3/90 gear test rig Start temperature: 90 °C	failure load stage	> 14	> 14	DIN ISO 14635-1
FZG A/16.6/140 gear test rig Start temperature: 140 °C	failure load stage	> 12	> 12	DIN ISO 14635-1
FZG-GFT* test GT-C/8.3/90 Load stage test	GF Class	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FZG-GFT* test GT-C/8.3/90 Endurance test	GF Class	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FE8 wear test, D7.5/80-80, Roller wear	mg	< 5	< 5	DIN 51819-3
Testing in mixed friction area according to Brugger	N/mm²	≥ 50	≥ 50	DIN 51347-2
Timken OK load	lbs	95	95	ASTM D 2782
4-Ball EP test	N	≥ 2400		DIN 51350-2
Weld load	kg	≥ 250		ASTM D 2783-88
Elastomer compatibility - dynamic and static: • 72NBR902 (1000 h, 80 °C – dynamic) • 75FPM585 (1000 h, 90 °C – dynamic) • 75FKM17055 (1000 h, 90 °C – dynamic) • SRE-NBR 28/SX according to DIN ISO 13226 (100 °C, 7 d – static)		 pass pass pass pass		Fuchs Inhouse Test according to DIN ISO 1817 and according to Flender DIN ISO 1817

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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.

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