

## RENOLIN MR

### Special Lubricating and Hydraulic Fluids with Excellent Corrosion Protection

#### Description

The products of the RENOLIN MR-series are special HLP-D lubricating and hydraulic fluids according to DIN 51 502 with excellent corrosion protection, outstanding contaminant-removing and transportation properties (detergent / dispersant properties). RENOLIN MR contains zinc and is used as a problem solver in hydraulic systems where standard oils fail.

#### Application

RENOLIN MR are lubricating oils for circulation and bearing lubrication, superbly suited for applications in mobile and stationary hydraulic systems where the use of a detergent / dispersant hydraulic oil with low friction coefficients, good stick-slip behaviour and excellent corrosion protection properties is required. RENOLIN MR is also suited for use as high-speed spindle oil, break-in oil, and corrosion protection oil.

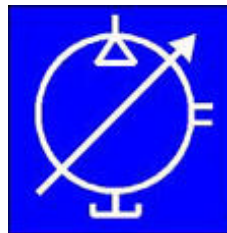
#### Specifications

The products meet or exceed the requirements according to:

- DIN 51 524-2: HLP (exception: demulsifying properties according to DIN 51 599)
- ISO 6743-4: HM

#### Advantages

- Excellent corrosion protection (see: test results, page 2)
- Low foaming tendency
- Good air release properties
- High ageing resistance
- Good viscosity-temperature behaviour
- Protects against wear
- Excellent contaminant-removing and transportation properties (detergent / dispersant properties)
- Low friction coefficient
- Reduces stick-slip effects



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#### Excellent Corrosion Protection

The RENOLIN MR oils have excellent corrosion protection properties that are typically expected only of special designed corrosion-protection oils. The excellent corrosion protection properties of the RENOLIN MR oils ensure that corrosion does not occur on steel and nonferrous metals in the system, even in the presence of water. We therefore recommend the use of RENOLIN MR oils as break-in oils and operational fluids. The metallic surfaces coated with these oils are safely protected against corrosion when stored properly.

For comparison:

#### RENOLIN MR 15

Test method	According to	Unit	
Corrosive effect on copper, 100A24	DIN EN ISO 2160	Degree of corrosion	1
Steel corrosion	DIN ISO 7120	Degree of corrosion	0-A
Hydrobromic acid immersion test	DIN 51 357	Degree of corrosion / number of sheets	0/3
Sea-water immersion test	DIN 51 358	Degree of corrosion / number of sheets	0/3
Damp heat atmosphere	DIN 50 017 SFW	Degree of corrosion / number of sheets, cycles	0/3 after 8 x 24 h

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#### Typical data:

Product name		0	1	3	5	
Properties	Unit					Test method
ISO VG				10	22	DIN 51 519
Kinematic viscosity at 40 °C	mm <sup>2</sup> /s	2	5	10	22	DIN EN ISO 3104
at 100 °C	mm <sup>2</sup> /s	-	1.6	2.6	4.3	
Viscosity index	-	-	83	91	100	DIN ISO 2909
Density at 15°C	kg/m <sup>3</sup>	817	837	852	868	DIN 51 757
Colour	ASTM	1.0	1.0	1.0	1.0	DIN ISO 2049
Flashpoint, Cleveland Open Cup	°C	75	85	166	165	DIN ISO 2592
Pourpoint	°C	-42	-36	-30	-30	DIN ISO 3016
Neutralisation number	mgKOH/g	0.3	0.7	0.7	0.7	DIN 51 558
FZG gear test rig, A/8,3/90	Failure load stage	-	-	-	-	DIN ISO 14635-1

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#### Typical data:

Product name		10	15	20	30	
Properties	Unit					Test method
ISO VG		32	46	68	100	DIN 51 519
Kinematic viscosity at 40 °C	mm <sup>2</sup> /s	32	46	68	100	DIN EN ISO 3104
at 100 °C	mm <sup>2</sup> /s	5.4	6.9	8.9	11.4	
Viscosity index	-	102	105	105	100	DIN ISO 2909
Density at 15°C	kg/m <sup>3</sup>	875	877	881	883	DIN 51 757
Colour	ASTM	1.5	1.0	1.5	1.5	DIN ISO 2049
Flashpoint, Cleveland Open Cup	°C	210	220	225	248	DIN ISO 2592
Pourpoint	°C	-30	-27	-24	-18	DIN ISO 3016
Neutralisation number	mgKOH/g	0.7	0.5	0.5	0.5	DIN 51 558
FZG gear test rig, A/8,3/90	Failure load stage	11	11	11	11	DIN ISO 14635-1



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#### Typical data:

Product name		40	90	140	
Properties	Unit				Test method
ISO VG		150	320	460	DIN 51 519
Kinematic viscosity at 40 °C	mm <sup>2</sup> /s	150	320	460	DIN EN ISO 3104
at 100 °C	mm <sup>2</sup> /s	14.8	24.8	31.0	
Viscosity index	-	98	99	95	DIN ISO 2909
Density at 15°C	kg/m <sup>3</sup>	889	903	907	DIN 51 757
Colour	ASTM	2.5	3.5	5	DIN ISO 2049
Flashpoint, Cleveland Open Cup	°C	250	265	297	DIN ISO 2592
Pourpoint	°C	-18	-12	-9	DIN ISO 3016
Neutralisation number	mgKOH/g	0.5	0.5	0.5	DIN 51 558
FZG gear test rig, A/8,3/90	Failure load stage	11	11	11	DIN ISO 14635-1

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While the information and figures given here are typical of current production and confirm to specification, minor variations may occur. No warranty expressed or implied is given concerning the accuracy of the information or the suitability of the products.