



Rando HD

Zinc based industrial and mobile hydraulic oils

Product description

Rando HD are a range of zinc based hydraulic oils for use in industrial and mobile service. The series is formulated with Group II base oils, in combination with rust and oxidation inhibitors, anti-foam and highly stable anti-wear additives, contributing to good pump and piston protection.

Customer benefits

- Anti-wear additive package helps promote reliable system protection, and anti-oxidation formulation helps to optimise fluid and filter service life.
- Formulated to help prevent abrasive rust particles, deposits, varnish and sludge, keeping filters clean and serviceable.
- Designed with good anti-foam and filterability in the presence of water contamination, promoting smooth, reliable operation and efficiency.

Product highlights

- **Helps optimise wear protection and service life**
- **Formulated to help resist rust, deposits, varnish, sludge**
- **Promotes good filterability and anti-foam**

Selected specification standards include:

ANSI/AGMA	Arburg
ASTM	Bosch Rexroth
DIN	Eaton (Vickers)
Fives Cincinati	General Motors
GROB	Husky
ISO	JCMAS
Joy	NSF
Parker Hannifan (Denison)	Rexnord Falk
SAE	US Steel (AIST)
ZF	

Applications

- Rando HD is recommended for use in many high-performance hydraulic applications in industrial and mobile service with moderate ambient temperatures, including high pressure vane and gear pumps and axial piston pumps.
- Rando HD 100, 150, 220 and 320 are recommended for use in hydraulic equipment reduction gears where EP properties are not required, as well as plain and antifriction bearings and circulating oil systems.
- Rando HD 100, 150, 220 and 320 are recommended for applications where AGMA rust and oxidation inhibited oils are required.
- Rando HD 10 and 22 can be used as spindle lubricants where zinc-free oils are not required. Rando HD 32, 46 and 68 are recommended for typical hydraulic oil applications where pressures may exceed 5000 psi, and for use in lightly loaded reciprocating compressors.

Product maintenance and handling

- Do not use in high pressure systems in the vicinity of flames, sparks, and hot surfaces.
- Use only in well-ventilated areas. Keep container closed.
- Do not use in breathing air apparatus or medical equipment.
- Avoid any spillage of used and unused product to the environment.
- Product residue and package/container should be disposed of in dedicated collection points.

Approvals, performance and suitable for use

	10	22	32	46	68	100	150
Arburg Injection Molding				A			
Bosch Rexroth RDE 90245			A	A	A		
Eaton (Vickers) E-FDGN-TB002-E			A	A	A		
Eaton (Vickers) 35VQ25A (Pump Test) I-286-S (Stationary) M-2950-S (Mobile)			M	M	M		
Fives Cincinnati ^a (formerly MAG Cincinnati, Cincinnati Machine, Cincinnati Milacron)			M p-68	M p-70	M p-69		
General Motors LS2 LH			M	M	M		
GROB Lubricants Chart	A	A	A	A	A		
Husky Injection Molding				A			
Joy HO-S					M		
NSF H2 ^b			A	A	A	A	A
Parker Hannifin (Denison) HF-0, HF-1, HF-2			A	A	A		
Rexnord Falk Class A, F, J, Planetgear, Class D, G, Y, Link Belt Model R					A	A	
ZF TE-ML 04K			A	A			
ANSI/AGMA 9005-E02, 9005-F16 R&O			M	M	M	M	M
ASTM D6158 HM	M	M	M	M	M	M	M
DIN 51524-2 HLP		M	M	M	M	M	
ISO 11158 L-HM	M	M	M	M	M	M	M
JCMAS HK VG 32, 46			M	M			
SAE MS1004-HM		M	M	M	M	M	
US Steel (AIST) 126, 127			M	M	M		

a: Obsolete specification

b: Rando HD ISO grades 32, 46, 68, 100, 150, 220, 320 are registered by **NSF** and are acceptable as lubricants where there is no possibility of food contact (H2) in and around food processing areas. The NSF Non-food Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements of appropriate use, ingredient review and labelling verification.

A: Approved for

M: Performance: Meets or exceeds requirements

Typical test data								
Test	Test Methods	Results						
Typical Shelf Life: 60 months from date of filling indicated on the product label ^o								
Viscosity Grade		10	22	32	46	68	100	150
Appearance	Visual	B&C	B&C	B&C	B&C	B&C	B&C	B&C
Kinematic viscosity at 40°C, mm ² /s	ASTM D445	10	22	32	46	68	100	150
Kinematic viscosity at 100°C, mm ² /s	ASTM D445	2.75	4.58	5.40	6.76	8.37	10.74	13.87
Viscosity Index	ASTM D2270	98	108	107	105	111	109	105
Colour	ASTM D1500	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L1.5
Flash point COC, °C	ASTM D92	176	200	196	232	250	270	280
Pour point, °C	ASTM D97	-24	-42	-33	-33	-36	-36	-36
Density at 15°C, kg/l	ASTM D4052	0.847	0.8567	0.8602	0.8632	0.8649	0.8666	0.8736
Water Separability, minutes to <3mL at 54°C	ASTM D1401	-	-	-	-	20	-	-
Water Separability, minutes to <3mL at 82°C	ASTM D1401	5	9	14	17	-	20	22
Air release at 50 °C, min	DIN 51558-1	1	1	2.3	3.7	8min48s	-	-
Air release at 75 °C, min	DIN 51381	-	-	-	-	-	9min48s	8min37s
TAN, mg KOH/g	DIN 51381	0.58	0.55	-	0.6	0.54	0.47	0.53
Copper corrosion (3 h, 100 °C)	ASTM D130	1A	1A	1A	1A	1A	1A	1A
Rust B	ASTM D665B	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Foam Seq. I , ml	ASTM D892	50/0	50/0	50/0	50/0	50/0	50/0	50/0
Foam Seq. II, ml	ASTM D892	50/0	50/0	50/0	50/0	50/0	50/0	50/0
Foam Seq. III , ml	DIN 53538-1	50/0	50/0	50/0	50/0	50/0	50/0	50/0
Water Content	ASTM D6304	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Seal testing - NBR28/PX, 7d/100°C	DIN 53538-1	-	-	-	-	-	-	-
Change in tensile strength at break,%		-4.9	-1.7	-1.7	-2.7	0.7	1.3	-1.5

Typical test data								
Test	Test Methods	Results						
Viscosity Grade		10	22	32	46	68	100	150
Change in max. Elongation, %		-11.7	-7.1	-7.1	-9.4	-3.2	-3.9	-13.2
Change in hardness, Shore A		-4	-2	-2	-1	-1	0	0
Change in volume, %		8.8	4.7	4.7	3.1	1.9	1.1	1.2
RPVOT,min	ASTM D2272	886	188	499	505	336	198	322
Oxidation Stability; TOST Hours to 2.0 mg KOH/g TAN	ASTM D943	-	-	>6000	>6000	>6000	>2000	>1200
FZG Gear Test Fail Load Stage	DIN 51354	-	-	12	12	12	12	12

°Typical Shelf Life: (a) if stored under normal conditions and (b) can be extended after re-testing

The typical test data set out above does not constitute a specification. It is indicative only and can be affected by allowable production tolerances. Chevron may modify this test data. Modified data will supersede all previous data, so please ensure you refer to the latest version of this Product Data Sheet (PDS).

Disclaimer: Data provided in this Product Data Sheet (PDS) is based on standard tests under laboratory conditions and is indicative only. This product should not be used for any purpose other than those expressly set out in this PDS. The user has sole responsibility for verifying that this product is suitable for the user's intended application. Neither Chevron nor its subsidiaries (i) make any warranty or representation as to the accuracy or completeness of this PDS; and/or (ii) accept liability for any loss or damage suffered as a result of the use of this product other than in accordance with the terms of this PDS.

Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

When disposing of used product, take care to protect the environment and follow local legislation.

Safety Data Sheets (SDS's) are available for all Chevron products. If you require a SDS or any further information regarding a Chevron product, please contact your local sales office or see <http://europe.chevronlubricants.com>.

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