MAK HYDROL HLP

Industrial extra heavy duty hydraulic fluid for long life, excellent performance and protection

MAK Hydrol HLP oils are high performance premium quality hydraulic oils. They are blended from highly refined, high viscosity index Group II plus base oils with carefully selected balanced antiwear additive. These oils are designed to operate over a wide range of working conditions including low load and severe high load conditions. They provide outstanding protection and performance in manufacturing and other operations. Formulated for excellent water separation, exceptional hydrolytic stability, anti-foam characteristics and cleanliness they allow efficient operation of the system. Superior moisture handling capability ensures longer life and reduces the risk of rusting and corrosion. MAK Hydrol HLP oils are compatible with seal materials and paints normally specified for use in hydraulic systems with mineral oils.

Grades: MAK Hydrol HLP range is available in the following ISO VG grades – **22**, **32, 46, 68, 100** and **150**

Applications:
MAK Hydrol HLP range is recommended for high pressure hydraulic power systems and a wide variety of circulation systems of industrial and automotive equipment. They are suitable for precision hydraulic systems requiring very high control of fluid viscosity like high performance electro-hydraulic or numerically controlled systems particularly where close clearance servo-valves are used. They are also used in general manufacturing, power and metal equipment operating at high speeds, loads and temperatures like presses, injection moulding, machine tools etc. These oils are also recommended for the lubrication of rotors, bearings, gears in rotary compressors like screw and vane type.

Performance/ Benefits:
Outstanding Oxidation Stability – outstanding resistance to the effects of oxidising agents. Resists sludge and deposit formation. Minimises filter choking. Ensures longer operating life, less maintenance and reduction in operating cost.

Superior Hydrolytic Stability – resists water absorption and the chemical decomposition of the oil in the presence of water. Protects from acid corrosion, rusting and allows longer oil life.

Excellent Wear Protection – excellent protection to the pump, valve and other system components. Operates on a wide range of load conditions – moderate to severe.

Good Thermal Stability – provides good resistance to thermal break down and capability to work under varied ambient and operating temperatures to offer optimum life and performance.

Anti-foam – allows precision control, high pump pressures and efficient power transfer.

Fast Air Release – ensures release of entrapped air from oil to offer superior performance of the control mechanism in the system.

Excellent Demulsibility – the rate of water separation from oil is very high. Increases system efficiency and reliability.

Increased System Reliability – by resisting thermal and chemical break down of the oil these oils minimise the risk of formation of the harmful sludge and deposit.

Specification:
- 11th FLS FZG-Niemann EP Test
- IS 11656:1986 (Reaffirmed 2013)
- Denison HF-0 and HF-2
- Eaton Vickers I-286-S and M-2950-S
- Eaton Vickers 35VQ25 Pump Test
- AIST 127
- Cincinnati Milacron P-70
- DIN 51524 Part 2 HLP type

Approval:
MAK Hydrol HLP 32 is approved by
- M/s. Voith (I) Ltd., Hyderabad for use in Voith variable speed and hydraulic coupling
- M/s. BHEL for use in boiler feed pumps, booster pumps and drive motor bearings

Product and Application Development Deptt.
BPCL, "A" Installation, Sewree Fort Road, Sewree (East),
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MAK Hydrol HLP 46 and 68 are approved by

- M/s. Ferromatik Milacron, Ahmedabad for injection moulding

Storage & Handling:

The product should be stored inside. Keep it properly sealed to avoid contamination. Avoid freezing. Shelf life is 5 yrs. under protected storage conditions.

Health & Safety:

They are unlikely to be hazardous when properly used in recommended applications. Contamination of the oil from other oils, greases, chemicals, dirty water etc. can occur during the use. It should be avoided. Regular monitoring of the in-use product is recommended.

Typical Physico-Chemical Data: MAK Hydrol HLP

Characteristics	Method	22	32	46	68	100	150
Appearance	Visual	Clear	Clear	Clear	Clear	Clear	Clear
Density, g/cc @15^{O}C	ASTM D1298	0.8495	0.8513	0.8561	0.8598	0.8644	0.8705
Kinematic Viscosity @40^{O}C, cSt	ASTM D445	22.9	32.6	46.1	68.3	100.5	150.7
Kinematic Viscosity @100^{O}C, cSt	ASTM D445	4.58	5.70	7.17	9.39	12.04	15.98
Viscosity Index	ASTM D2270	115	115	115	115	110	110
Flash Point, COC, ^{O}C	ASTM D92	210	210	244	248	256	260
Pour Point, ^{O}C	ASTM D97	-21	-21	-21	-18	-18	-18
Copper Corrosion, 100^{O}C, 3 hrs.	ASTM D130	1a	1a	1a	1a	1a	1a
Foaming Characteristics/ Stability Sequence I/ II/ III	ASTM D892	NIL	NIL	NIL	NIL	NIL	NIL
Demulsibility (ml-mins)	ASTM D1401	40-40-0 (10)	40-40-0 (15)	40-40-0 (15)	40-40-0 (20)	40-40-0 (30)	40-40-0 (30)
FZG Rating, FLS	ASTM D5182	11	11	11	11	11	11

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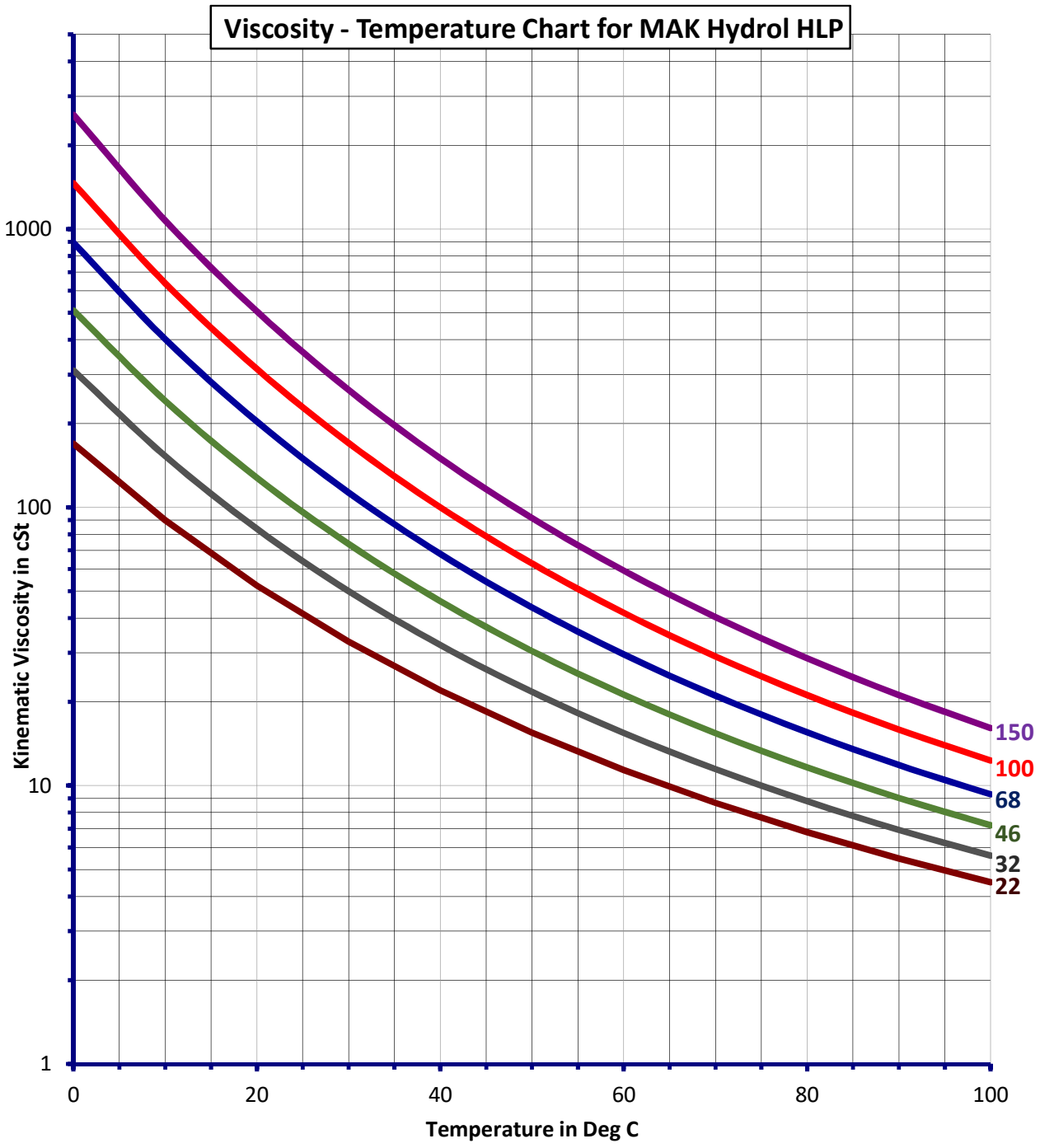

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