MAK HYDROL

Antiwear type spindle oils

MAK Hydrol range of low viscosity oils is a group of premium quality, transparent and antiwear spindle oils. They are blended from high viscosity index base stocks with selected antiwear additive. These oils are designed to provide excellent protection against wear. Low viscosity reduces operating temperature. Superior oxidation stability, antirust capability and resistance to deposit formation allow efficient operation and enhance the reliability of the system.

Grades: MAK Hydrol range of spindle oils are available in the following ISO VG grades – **15** and **22**, Non-ISO VG grade – **12**

Applications:
MAK Hydrol range of spindle oils is specially developed for the lubrication of high speed spindles in machine tools. These oils are recommended for hydraulic systems requiring low viscosity grades and a wide variety of circulation systems of industrial and automotive equipment. They are also used in general manufacturing, power, metal equipment and light duty general machining operations. MAK Hydrol fluids are compatible with seal materials and paints normally specified for use in hydraulic systems with mineral oils.

Performance/ Benefits:
Superior Oxidation Stability – excellent resistance to oxidation. Resists sludge and deposit formation. Minimises filter choking and valve sticking. Longer operating life and reduction in operating cost.

Antiwear Protection – excellent protection to the spindles, pump, valve and other system components.

Good Thermal Stability – provides good resistance to thermal break down to offer optimum life and performance.

Ashless Additive – MAK Hydrol 12 and 15 have ashless (Zinc-free) antiwear additive. They are suitable for operating in humid condition.

Anti-foam – maintains oil film and allows precision control of the system.

Excellent Demulsibility – the rate of water separation from oil is very high. Provides rust protection.

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

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

Specification:
- IS 3098:1983 (Reaffirmed 2014)
- IS 10522:1983 (Reaffirmed 2014)
- Vickers V-104C Vane Pump Test
- DIN 51524 Part 1 HL type

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.

Product and Application Development Deptt.
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Typical Physico-Chemical Data: MAK Hydrol (Spindle Oils)

Characteristics	Method	12	15	22
Colour	Visual	Water white to pale yellow	Water white to pale yellow	Water white to pale yellow
Appearance	Visual	Clear	Clear	Clear
Density, g/cc @15^{O}C	ASTM D1298	0.8492	0.8497	0.8502
Kinematic Viscosity @40^{O}C, cSt	ASTM D445	12.8	15.3	22.6
Kinematic Viscosity @100^{O}C, cSt	ASTM D445	3.19	3.57	4.54
Viscosity Index	ASTM D2270	115	115	115
Flash Point, COC, ^{O}C	ASTM D92	190	194	200
Pour Point, ^{O}C	ASTM D97	-15	-15	-15
Copper Corrosion, 100^{O}C, 3 hrs.	ASTM D130	1a	1a	1a
Foaming Characteristics/ Stability, ml Sequence I/ II/ III	ASTM D892	NIL	NIL	NIL
Demulsibility @54^{O}C, (ml-mins)	ASTM D1401	40-40-0 (10)	40-40-0 (10)	40-40-0 (15)

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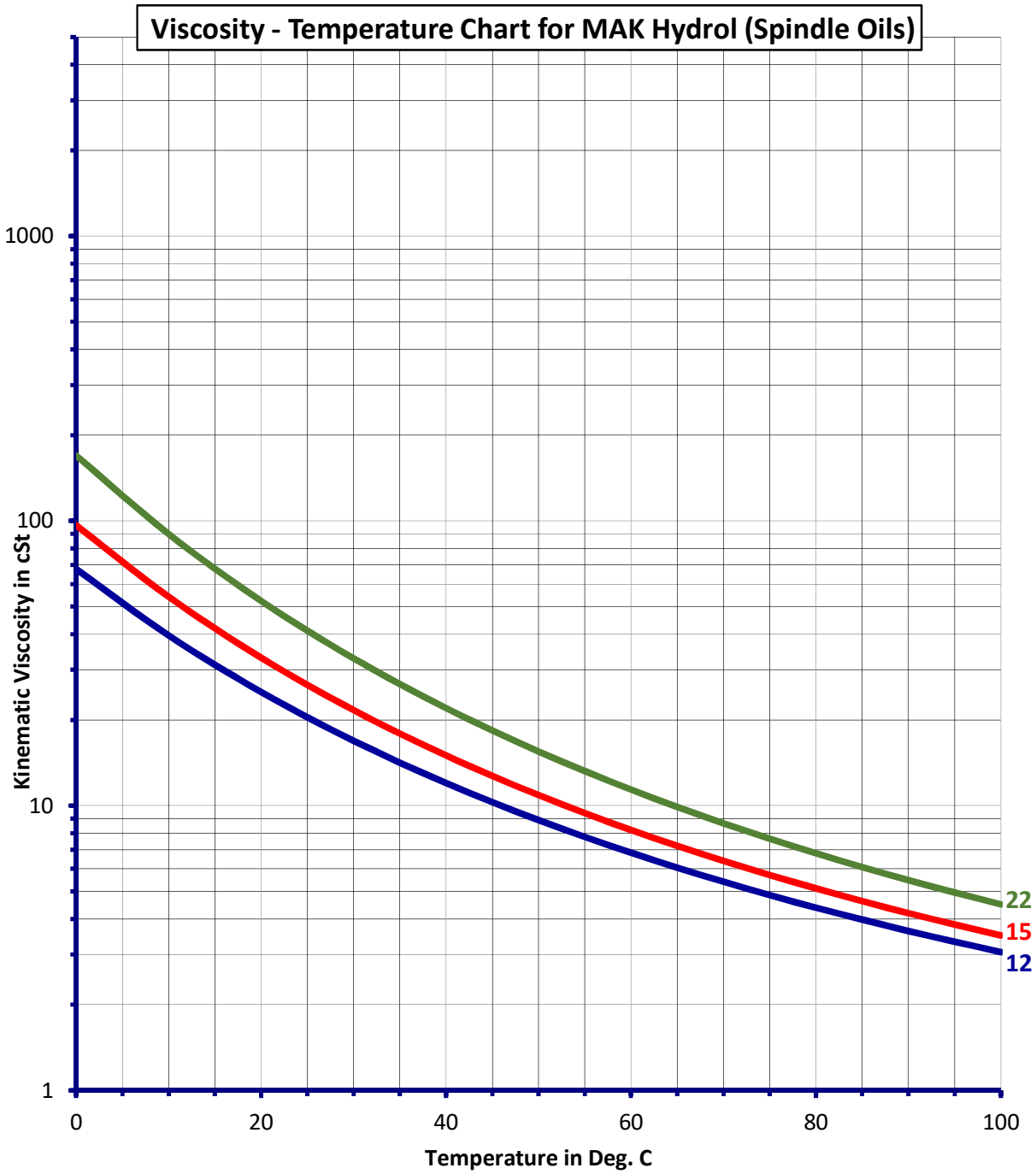
Viscosity - Temperature Chart for MAK Hydrol (Spindle Oils)
Kinematic Viscosity in cSt
1000
100
10
1
0
20
40
60
80
100
Temperature in Deg. C
22
15
12