

MAK TURBOL

Superior quality industrial steam, gas and hydraulic turbine oils

MAK Turbol oils are high performance oils blended from highly refined, high viscosity index Group II plus base stocks and carefully selected additive. These oils are developed to meet the demands of the modern steam, gas and hydraulic turbines. The additive system imparts extremely high resistance to the chemical and thermal degradation of the oil. Outstanding oxidation and thermal stability offers long oil life, a high degree of protection and minimised deposit formation. Formulated for excellent water separation, anti-foam characteristics, rapid air release and cleanliness they allow efficient operation of the system, ensure longer life and reduce the risk of rusting and corrosion. MAK Turbol oils are compatible with seal materials and paints normally specified for use in turbine systems with mineral oils.

Grades: MAK Turbol range is available in the following ISO VG grades – **32, 46** and **68** Non-ISO VG grades – **37, 57** and **78**

Applications:

MAK Turbol range is recommended for the most modern steam, gas and hydraulic turbines. They are used in the pressure circulation lube oil system of the turbines. These oils do not provide enhanced antiwear performance for the gearbox. They are suitable for the lubrication of the bearings of rotary and turbo compressors. Numerous other applications where bearings are prone to water contamination or high control over rust and oxidation is required can use these grades. MAK Turbol 57 is used in some old steam and hydraulic turbines. MAK Turbol 78 is used as suspension bearing oil (journal bearing) in diesel electric locomotives.

Performance/ Benefits:

Superior Water Shedding Property – the rate of water separation from oil is very high. Water can be drained from the lubrication system easily minimising rusting. Increases system efficiency and reliability

Outstanding Oxidation Stability – outstanding resistance to the effects of oxidising agents results in minimising deposit formation and filter choking. Ensures longer operating life, less maintenance and reduction in operating cost.

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.

Fast Air Release and Resistance to Foaming – allows precision control and high pump pressures. Ensures release of entrapped air from oil to offer superior performance of the control mechanism in the system. Coupled with fast air release property it resists pump cavitation, wear and premature oxidation.

Increased System Efficiency – by resisting thermal and chemical break down, maintaining filterability, cleanliness, excellent water separation and anti-foam characteristics these oil help to maintain system efficiency and reliability.

Specification:

- IS 1012:2002 (Reaffirmed 2013)
- BS 489:1983
- GEK 32568H
- DIN 51515 Part 1

Approval:

- Alstom Power – MAK Turbol 32, 46
- Siemens – MAK Turbol 32, 46
- BHEL – MAK Turbol 32, 46
- Greensol Power Systems

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 Turbol**

Characteristics	Method	32	37	46	57	68	78
Appearance	Visual	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright
Density, g/cc @15°C	ASTM D1298	0.8512	0.8528	0.8552	0.8597	0.8612	0.8632
Kinematic Viscosity @40°C, cSt	ASTM D445	32.9	37.3	46.5	57.4	68.8	78.6
Kinematic Viscosity @100°C, cSt	ASTM D445	5.73	6.24	7.21	8.31	9.44	10.37
Viscosity Index	ASTM D2270	115	115	115	115	115	115
Flash Point, COC, °C	ASTM D92	228	230	236	240	250	252
Pour Point, °C	ASTM D97	-18	-18	-18	-18	-18	-15
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1a	1a	1a	1a	1a	1a
Foaming Characteristics/ Stability, ml Sequence I/ II/ III	ASTM D892	NIL	NIL	NIL	NIL	NIL	NIL
Rust Test, A & B	ASTM D665	Pass	Pass	Pass	Pass	Pass	Pass
Demulsibility @54°C, mins.	ASTM D1401	40-40-0(10)	40-40-0(10)	40-40-0(10)	40-40-0(10)	40-40-0(15)	40-40-0(15)
TAN, mg of KOH/ g	ASTM D974	0.07	0.07	0.08	0.08	0.08	0.08
TOST, (Time to reach TAN 2.0 mg of KOH/g), hrs.	ASTM D943	>10000	>10000	>10000	>10000	>10000	>10000