

MAK TURBOL EP

High quality heavy duty turbine oils for geared turbines

MAK Turbol EP 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 high-output modern geared turbines. The additive system imparts extremely high extreme pressure properties, 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 EP oils are compatible with seal materials and paints normally specified for use in turbine systems with mineral oils.

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

Applications:

MAK Turbol EP range is recommended for the most modern geared steam, gas and hydraulic turbines. They are used in the pressure circulation lube oil system of the turbines and provide enhanced antiwear performance for the gearbox. These are also suitable for lubrication of the bearings of rotary and turbo compressors.

Performance/ Benefits:

Excellent EP property – excellent ability to withstand higher loads and shock loads encountered in the application. It provides protection to the gears and assures system reliability.

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 2
- 10th FLS FZG-Niemann EP Test
- Siemens TLV 9013-05
- Brown Boveri HTGD 90117E

Approval:

- Alstom Power – MAK Turbol EP 32, 46
- Siemens – MAK Turbol EP 32, 46
- BHEL – MAK Turbol EP 32, 46
- GE Triveni Ltd.
- 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 EP**

Characteristics	Method	32	46	57	68	78
Appearance	Visual	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright
Density, g/cc @15°C	ASTM D1298	0.851	0.8551	0.8595	0.8611	0.8629
Kinematic Viscosity @40°C, cSt	ASTM D445	32.5	46.5	57.6	68.8	78.2
Kinematic Viscosity @100°C, cSt	ASTM D445	5.73	7.21	8.31	9.44	10.37
Viscosity Index	ASTM D2270	115	115	115	115	115
Flash Point, COC, °C	ASTM D92	238	246	252	256	260
Pour Point, °C	ASTM D97	-18	-18	-18	-18	-15
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1a	1a	1a	1a	1a
FZG Gear test, Pass load stage A/16.6/90	DIN 51354-2	9th	9th	9th	9th	9th
Foaming Characteristics/ Stability, ml Sequence I, II & III	ASTM D892	NIL	NIL	NIL	NIL	NIL
Rust Test, A & B	ASTM D6658	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(15)	40-40-0(15)
Total Acid No., mg of KOH/ g	ASTM D974	<0.1	<0.1	<0.1	<0.1	<0.1
TOST, (Time to reach TAN 2.0 mg of KOH/g), hrs.	ASTM D943	>10000	>10000	>10000	>10000	>10000