



MAK SYNGEAR

Advanced synthetic oils for heavy duty industrial gears

MAK Syngear is a range of fully synthetic gear oils with outstanding lubrication performance. They are formulated from special quality wax-free polyalphaolefin (PAO) synthetic base stocks that have exceptional oxidation resistance and thermal properties, high viscosity index and excellent low temperature fluidity. Their high load carrying capacity and anti-friction property offer excellent performance in industrial gears and other industrial applications. The high viscosity index and low traction coefficient of these oils combine to provide a potential reduction in power consumption in many gear systems. These oils have been developed to deliver optimum value through enhanced wear protection, long oil life and high system efficiency. The superior quality non-chlorinated additive chemistry imparts high level of antiwear and extreme pressure property. They are specially formulated to protect heavily loaded industrial gears against destructive wear on gear teeth caused by micropitting. MAK Syngear meets the requirements of M/s. Flender AG for anti-micropitting gear oil. These oils have excellent compatibility with ferrous and non-ferrous metals even at high temperatures. MAK Syngear oils are compatible with seal materials and paints normally specified for use in industrial gear systems with mineral oils.

Grades: MAK Syngear range is available in the following ISO VG grades – **150, 220, 320, 460, 680 and 1000**

Applications:

MAK Syngear oils are designed primarily for the lubrication of all types of industrial enclosed gear drives functioning under severe stresses with forced circulation or splash or oil bath lubrication systems operating in aggressive and harsh environment. These grades are designed to be used in applications that may be subject to micropitting. They provide dependable performance for continuous service even under widely varying operating temperatures and also in applications where corrosion may be severe. These oils are intended for use in heavily loaded spur, bevel, helical, herringbone and planetary gear units as well as plain antifriction bearings subjected to shock/ heavy loads and gear couplings. It is suitable for applications where OEMs are specifically recommending synthetic extreme pressure gear oil.

Performance/ Benefits:

Resistance to Micropitting – offers excellent anti-micropitting performance and reduces the risk of premature failure of gear through surface distress. Protection from micropitting fatigue is important to prevent destructive wear at the micro level and thereby meeting the evolving demands of smaller and higher output gear boxes.

Outstanding Oxidation Stability – outstanding resistance to the effects of oxidising agents. Resists sludge and deposit formation. Minimises filter choking and valve sticking due to oil ageing. Ensures reliability, longer operating life and less maintenance.

Excellent EP Property – provides excellent load bearing capability and helps to reduce gear tooth and bearing wear on both steel and bronze components. Extends the life and availability of the equipment.

Excellent Thermal Stability – provides resistance to thermal break down and capability to work under varied ambient and operating temperatures to offer optimum life and performance. Offers longer oil life and extended drain period.

Resistance to Foaming – allows effective lubrication, precision control and efficient power transfer. Maintains system efficiency.

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

Long Oil Life – provides excellent resistance to oil break down over long duration and/ or high temperature operation.

Good Corrosion Protection – provides protection from rusting and corrosion of the equipment.

Low Traction Properties – Excellent low temperature performance and lower fluid friction in comparison to mineral based products



Wide Range of Viscosities – caters to wide range of difficult and heavy duty applications.

Excellent Compatibility – with internal gearbox paints, solid seals and liquid seals.

Increased System Reliability – minimises the risk of formation of the harmful sludge and deposit by resisting thermal and chemical break down of the oil. Offers good lubrication at low temperature start-up.

Specification:

- AIST 224
- AGMA 9005-E-02
- DAVID BROWN S. 1. 53. 106 Type E
- DIN 51517 PART 3 (CLP)
- Cincinnati Milacron P-74
- 12th FZG-Niemann EP Test
- 10th FZG Micropitting Test at 90°C

Approvals:

- Siemens AG (Flender Gear) for ISO VG 150 to 680
- FLSmidth MAAG Gear AG for ISO VG 100 to 460

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 Syngear

Characteristics	Method	100	150	220	320	460	680	1000
Appearance	Visual	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright
Density, g/cc @15°C	ASTM D1298	0.850	0.853	0.859	0.858	0.861	0.864	0.853
Kinematic Viscosity @40°C, cSt	ASTM D445	100.5	150.1	221.4	327.0	462.7	645.1	970.8
Kinematic Viscosity @100°C, cSt	ASTM D445	14.75	19.84	26.11	35.53	47.44	62.30	82.08
Viscosity Index	ASTM D2270	152	152	150	154	159	166	165
Flash Point, COC, °C	ASTM D92	240	246	250	256	258	262	264
Pour Point, °C	ASTM D97	-35	-35	-35	-36	-39	-36	-36
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1b	1b	1b	1b	1b	1b	1b
Rust test, Procedure A & B	ASTM D665	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Foaming Characteristics/ Stability, ml	ASTM D892							
a) Sequence I		0/0	0/0	0/0	0/0	0/0	0/0	0/0
b) Sequence II		10/0	10/0	10/0	10/0	10/0	10/0	10/0
c) Sequence III		0/0	0/0	0/0	0/0	0/0	0/0	0/0
FZG Gear test, Pass load stage A/8.3/90 A/16.6/90	DIN 51354-2	12 12	12 12	12 12	12 12	12 12	12 12	12 12
FZG Micro pitting, 90°C Stage/Rating	FVA 54	10/ High	10/ High	10/ High	10/ High	10/ High	10/ High	10/ High
Timken EP Test, OK Load, lb	ASTM D2782	80	80	80	80	80	80	80
Four Ball Weld Load, kg	ASTM D2783	250	250	250	250	250	250	250
Load Wear Index	ASTM D2783	52	52	52	52	52	52	52
FAG FE 8 Bearing Wear Test	DIN 51819-3							
a) Roller Wear, mg		10	10	5	5	5	5	5
b) Cage Wear, mg		60	60	50	50	50	50	50