MAK AMOCAM PLUS

Advanced extreme pressure, anti-micropitting oils for heavy duty industrial gears

MAK Amocam Plus is a range of advanced, heavy duty, extreme pressure industrial gear lubricants blended from high viscosity index and high quality base stocks. These oils have been developed to deliver optimum value through enhanced wear protection, long oil life and high system efficiency. The superior quality additive chemistry imparts high level of antiwear and extreme pressure property. 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. They are specially formulated to protect heavily loaded industrial gears against destructive wear on gear teeth caused by micropitting. MAK Amocam Plus meets the requirements of M/s. Flender AG for anti-micro pitting gear oil. Formulated with antifoam, antirust and antioxidation agents they offer excellent lubrication performance and long service life in varied temperature conditions. These oils are compatible with ferrous and non-ferrous metals even at high temperatures. MAK Amocam Plus oils are compatible with seal materials and paints normally specified for use in industrial gear systems with mineral oils.

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

Applications:
MAK Amocam Plus oils are designed primarily for the lubrication of all types of industrial enclosed gear drives functioning under severe stresses with circulation or splash lubrication systems operating in aggressive and harsh environment. These grades are designed to be used in applications where there is a possibility of micropitting and they provide dependable performance for continuous service even under extreme operating conditions. These oils are intended for use in heavily loaded spur, bevel, helical and planetary gear units as well as plain antifriction bearings subjected to shock/ heavy loads and gear couplings. Specific applications include heavy duty multi-stage industrial reduction gears units in steel plants, power plants, cement plants and also in units found in conveyors, agitators, dryers, fans, mixers, presses, extruders etc.

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.

Superior Water Separation – allows excess water to be separated and drained from the system. Resists corrosion and surface fatigue on gears and bearings.

Good Antirust Property – provides protection from rusting and corrosion of the equipment.

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

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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.

Specification:

- IS 8406:1993 (EP Type) (Reaffirmed 2016)
- IPSS: 1-09-003
- AIST 224
- David Brown S.1.53.101
- 12th Pass FZG-Niemann EP Test
- DIN 51517 Part 3 (CLP)
- AGMA 250.04 5 EP & AGMA 251.02.5 EP
- 10th FZG Micropitting Test at 90^{O}C

Approvals:

- Siemens AG (Flender Gear)
- FLSmidth MAAG Gear AG

Storage & Handling:

The product should be stored inside. Keep it properly sealed to avoid contamination. Avoid freezing. Shelf life is 3 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 Amocam Plus

Characteristics	Method	150	220	320	460
Colour	Visual	Brown	Brown	Brown	Brown
Appearance	Visual	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright
Density, g/cc @15^{O}C	ASTM D1298	0.8946	0.8996	0.9046	0.9081
Kinematic Viscosity @40^{O}C, cSt	ASTM D445	152.9	225.9	324.1	462.3
Kinematic Viscosity @100^{O}C, cSt	ASTM D445	15.4	20.0	25.5	30.6
Viscosity Index	ASTM D2270	102	102	102	96
Flash Point, COC, ^{O}C	ASTM D92	252	254	256	258
Pour Point, ^{O}C	ASTM D97	-15	-12	-12	-9
Copper Corrosion, 100^{O}C, 3 hrs.	ASTM D130	1b	1b	1b	1b
Foaming Characteristics/ Stability, ml Sequence I, II, & III	ASTM D892	NIL	NIL	NIL	NIL
FZG Gear test, Pass load stage A/16.6/90	DIN 51354-2	12	12	12	12
FZG micropitting, 90^{O}C , Damage load stage	FVA 54	≥10	≥10	≥10	≥10
Timken EP Test, OK Load, lb	ASTM D2782	75	80	80	80

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