

MAK MARINE X 405

Crankcase oil for medium-speed trunk piston engines using high sulphur fuels

MAK Marine X 405 is a multifunctional engine oil developed for use in large capacity slow and medium-speed marine engines operating on low-grade residual fuels with high sulphur content. It is designed to withstand the severe stress encountered by the oil in modern marine engines designed for higher rated power output and efficiency. It can handle the stressed condition in terms of acid neutralisation and sludge handling capability. Superior quality additive chemistry imparts very high resistance to oxidative and thermal stress on the oil. MAK Marine X 405 oil has the ability to retain TBN over a long service life. It offers excellent protection to engine components against rust, corrosion and wear.

Applications:

They are recommended for all types of latest generation large capacity low and medium speed Trunk Piston Marine engines operating on inferior quality high sulphur residual fuels and used for power generation and marine application where there is requirement of API CF diesel detergency. They are also suitable for use in Anti-Bore Polish Rings.

Commonly Used Classification of Diesel Engines:

Type	Slow Speed	Medium Speed	Medium to High Speed	High Speed
Speed (rpm)	Upto 250	250 – 750	600 – 1500	Above 1500

Performance/ Benefits:

Excellent Resistance to Oxidation – outstanding resistance to the effects of oxidising agents. Resists sludge and deposit formation. Minimises filter choking and valve sticking. Ensures reliability, longer drain period and less maintenance.

Excellent TBN Retention – has the ability to retain TBN over a long service life to neutralise combustion acids and protect engine components. High alkalinity level controls cylinder wear.

Clean Engine – highly optimised and effective level of detergency ensures clean engine components like crankcase, valve deck, piston, piston under-crown etc. Controls deposit build-up on piston land and ring to prevent ring sticking.

Balanced Detergency and Dispersancy – combination of high detergency and low dispersancy allows excellent separation of heavy contaminants and water in centrifuge.

Good Water Resistance – outstanding capacity to separate water leads to removing maintaining engine performance after water ingress

Good Antiwear Property – protects engine components like liner, ring from wear. Provides excellent protection against adhesive wear of cam, camshaft and bearings. Enhances system reliability.

Resistance to Rust & Corrosion – provides excellent protection from rust and corrosion.

Performance Level/ Specification:

- API CF

Typical Physico-Chemical Data: MAK Marine X 405

Characteristics	Method	Value
Appearance	Visual	Clear & Bright
Color	Visual	Brown
SAE Viscosity Grade		40
Density, g/cc @ 15°C	ASTM D1298	0.9268
Kinematic Viscosity @40°C, cSt	ASTM D445	137.3
Kinematic Viscosity @100°C, cSt	ASTM D445	14.5
Viscosity Index	ASTM D2270	105
Flash Point, COC, °C	ASTM D92	258
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1a
Total Base Number, mg KOH/ g	ASTM D2896	55
Foaming Characteristics, Stability Sequence I/ II/ III	ASTM D892	NIL

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:

This oil is 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.