

MAK TO-4 SAE 10W

Transmission oil meeting Caterpillar TO-4 specification

MAK TO-4 SAE 10W is designed to meet the latest and stringent Caterpillar TO-4 specification for transmission and drive train. It is formulated with superior quality base oils and additive technology developed for Caterpillar equipment. It provides significantly improved transmission performance over TO-2 oils. TO-4 supersedes and replaces Caterpillar TO-2 requirements. MAK TO-4 SAE 10W oil is specially developed for hydraulics systems of power shift transmissions in off highway equipment. Internal clutches are applied hydraulically and the power flows through gear sets to output shafts. Hence, the frictional properties of oil are very critical. The additive chemistry imparts excellent frictional characteristics for clutches and wet brakes and its retention over an extended period. It offers anti-wear capability and improved oxidation stability.

Applications:

MAK TO-4 SAE 10W is recommended for use in hydraulic systems, hydrostatic drives, automatic transmission and power shift transmission of CAT equipment, friction devices, clutches and wet brakes in off-highway equipment. It is also suitable for older CAT equipment.

Performance/ Benefits:

Resistance to Oxidation and Thermal Degradation – resists the effects of oxidising agents and thermal stress. Extends life of transmission components due to minimal deposits formation tendencies.

Wear Protection – offers protection to gears against wear and pitting. Protects transmission components like bearings against wear. Helps prevent premature failures.

Superior Frictional Characteristics – offers a delicate balance of static and dynamic frictional characteristics. Helps eliminate chatter in wet brakes of Caterpillar machines.

Excellent Rust and Corrosion Protection – reduces corrosion wear and maintenance cost and enhances transmission system life.

Low Temperature Lubrication – facilitates easy start-up and gear shifting at low ambient temperatures.

Excellent Seal Compatibility – offers extended life of seal, minimum leakage and reduced contamination.

High Shear Stability – provides excellent protection during the life of the lubricant.

Anti-foaming Characteristics – exhibits low foaming tendency and ensures effective lubrication and functioning under all operating conditions.

Performance Level/ Specification:

- Caterpillar TO – 4
- Allison C – 4
- ZF TE ML 03/01

Typical Physico-Chemical Data: MAK TO-4 SAE 10W

Characteristics	Method	Value
SAE Viscosity Grade	SAE J300	10W
Colour	Visual	Brown
Appearance	Visual	Clear and Bright
Density @15°C, g/cc	ASTM D1298	0.879
Kinematic Viscosity @40°C, cSt	ASTM D445	36.92
Kinematic Viscosity @100°C, cSt	ASTM D445	5.9
Viscosity Index	ASTM D2270	102
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1b
Flash Point, °C	ASTM D92	232
Pour Point, °C	ASTM D97	-27
Foaming Tendency, ml/ml	ASTM D892	
a) Sequence I		0/0
b) Sequence II		10/0
c) Sequence III		0/0

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:

It is unlikely to be hazardous when properly used in recommended applications. Contamination of the coolant 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.