

General information

The tasks performed by lubricants are just as important as those performed by parts and components. Lubricants can identify the technical processes occurring in a

Viscosity

The viscosity (flow resistance) is the ability of a lubricating oil to establish internal resistance (friction) against distortion (relative motion between two fluid layers). The viscosity rating indicates the flowability of the lubricating oils (e.g. in the low and high temperature range).

Dynamic viscosity

The SI unit (SI = Système International d'Unités) for dynamic viscosity is the Pascal second (Pa s).

Measuring unit: 1 Pa s = 1 Ns/m².

Viscosity conversion: 1 mPa s = 1 cP (centipoise).

Kinematic viscosity

The kinematic viscosity can be identified as the ratio of dynamic viscosity to density. The SI unit is m²/s.

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Viscosity conversion: 1 mm²/s = 1 cSt (centistoke).

Viscosity temperature response (VT response)

The VT response of a mineral oil indicates the change in viscosity under the influence of temperature. The viscosity of mineral oil changes with the temperature and the pressure, that of structurally viscous oils also under the influence of the shear rate.

Viscosity index (VI)

The viscosity index identifies the viscosity temperature characteristics of mineral oil. It is a calculated °C and 100 °C.

SAE viscosity grades

The Society of Automotive Engineers (SAE) has established a classification for the SAE viscosity grades for engine oils and gear oils.

SAE grades for engine oils

SAE J 300 lists the SAE viscosity grades for engine oils. Oils marked with the letter "W"

have defined cold-flow properties, i.e. two low-temperature viscosities, Cranking Viscosity and Pumping Viscosity (both dynamic viscosities in mPas), are specified for each

"W"

grade oil (see Sheet 211.0). In the high-temperature range, oil viscosities are specified at a temperature of 100 °C (kinematic viscosity in mm²/s), and the dynamic viscosity and high-shear viscosity 10⁶ s⁻¹ (dynamic viscosity in mPas) at 150 °C.

SAE grades for gear oils

The SAE viscosity grades for gear oils are standardized in SAE J 300. Gear oils with gear oil

Additives

The high demands made on lubricating oils today can only be met by blended lubricating oils, that is, by oils with special chemical additives which are dissolved in the oil.

The type and quantity of the additives must be accurately adapted to the functions of the respective components. The effects of additive components in the oils and their performance characteristics

are tested during

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pensive tests.

It is therefore our policy to approve and list in our Mercedes-Benz Specifications for Operating Fluids only those lubricants which have been tested by DaimlerChrysler AG.

The principal requirements in respect of lubricating oils, and their additives, are described in Sheet 221.0 for engine oils, 231.0 for gear oils and 261.0 for lubricating greases.

If lubricants must be changed or replenished, and the brand used up to now is not available, another approved brand of the same type may be used without fear of subsequent damage. No special relubricating (cleaning) instructions need to be observed.

However, repeated changes of oil brands without a definite reason should be avoided, since the resulting

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res may be less efficient than intended.