ANALYSIS OF THE DEPRESSOR ADDITIVE EFFECT ON THE POUR POINT OF MOTOR OILS

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Reliability and endurance of technological equipment and mechanisms largely depend on the used lubricants.

It is known that special additives are used to improve the various properties of motor oil. Lubricating additives – improves lubricating properties, detergents – provide flushing of engine systems from carbon deposits, depressor additives are used to prevent motor oil from freezing, etc.

In this work, the effect of a depressor additive on the pour point of motor oils of various compositions is investigated, a comparative analysis of the pour point of oils before and after the addition of the depressor additive is carried out.

Three samples of motor oils were taken for the study: MOTO2T – motor oil intended for use in two-stroke gasoline engines of vehicles, garden equipment and hand-held motor tools; 80W-85 – transmission oil, as well as sample of compressor mineral oil.

The concentration of the used depressor additive was 0.1 ml per 100 ml of the sample. The pour point of the samples in the work was determined according to [1]. The results are shown in Table 1.

Based on the results presented in Table 1, it can be concluded that the pour point of motor oil 80W-85 after the addition of a depressor additive changed slightly (decrease of 3 °C). At the same time the pour point of compressor oil and MOTO2T oil improved its values by an order of magnitude (compressor oil decrease of 23 °C, MOTO2T brand oil decrease of 9 °C).

The difference in the change in the pour point is due to the difference in the composition of the oils. Density can be considered as an indirect indicator of the oil composition. Table 2 shows the density of three oil samples at a temperature of 20 °C, determined according to [2].

Based on the data presented in Table 2, we can come to the following conclusion: then lighter the oil – then higher the effectiveness of the additive in relation to the pour point of the oil and vice versa, then heavier the sample of oil, then smaller the change in the pour point when a depressor additive is added.

Table 1. Pour point of the studied oil samples

Oil sample	MOTO2T	80W-85	Mineral compressor oil
Pour point without additive, °C	–7	–17	–13
Pour point with additive, °C	–16	–20	–36

Table 2. Density of the studied oil samples

Oil sample	MOTO2T	80W-85	Mineral compressor oil
Density, g/cm^3	0.8825	0.8831	0.8559

References

1. *USS 20287-91 "Petroleum products. Methods of test for flow point and pour point" – M: Standartinform, 2006. – 9 p.*
2. *ISO 12185:1996 "Crude oil and petroleum products. Determination of density. Method using an oscillating U-shaped tube" [Electronic resource] – Electron. dan., 2020. – Access mode: https://www.iso.org.*