cupronickel is also quite high. Alloy T30K4, though possessing inferior wettability, was also tested in compositions with cupronickel since practically it does not produce a diffusion softened zone because of the high amount of titanium carbide and possesses high hardness (HRA 92) and abrasion resistance.

Studies of devulcanizer cases hard-faced with made-up alloy VK + TK + MNMs 20-20 showed that their life rose sixfold compared with cases made of heat-treated steel 38KhMYuA.

Tests are presently being carried out on granulating heads (dies) hard-faced with made-up alloys.

LITERATURE CITED


NEW COMPRESSOR OIL KZ-10


Modern compressors [1] require light compressor oils containing effective additives ensuring high oxidation stability, low tendency to carbon deposition, and good lubricating capacity.

The All-Union Research Institute of Petroleum Refining together with the All-Union Research and Design Institute of Compressors carried out investigations on a new compressor oil KZ-10 with viscosity 9-11 mm²/sec at 100°C. The oil has excellent thermal stability and anticarbon-depositing and antifoaming properties, and good lubricating capacity. According to the standard classification of compressor oils, oil KZ-10 falls in the third group [2]. In Table 1 are shown the basic characteristics of the oils studied.

As could be seen from Table 1, the viscosity of oil KZ-10 is one-half that of the commercial oil KS-19. The coking capacity of KZ-10 is also oil.

The overall oxidation stability of the oils studied was evaluated according to GOST 981-75 at 140°C and oxygen flow rate 50 ml/min for 35 h. It was established that the commercial oil KS-19 without additives oxidized rapidly, its acid number rising 30 times more rapidly than of experimental oil KZ-10 (Fig. 1).

The oil used for lubricating the motive system and compressor cylinders should possess high oxidation stability on prolonged residence in the crankcase and also in a thin layer. Compressor oils used for lubricating the friction system piston–cylinder will have to meet the most exacting specifications. The oil in this system is exposed to certain specific conditions: very thin layer, high temperature and pressure, contact with atmospheric oxygen, and the catalytic action of the metal.

The oxidation stability of oils in a thin layer was evaluated according to GOST 23175-78 at 200°C from the tendency of the oil to lacquer deposition. The results show (Fig. 2) that the commercial distillate Kp-8 having high oxidation stability in bulk as well as in a thin layer from its tendency to lacquer deposition is considerably inferior to the high-viscosity commercial oil KS-19. Compressor oil KZ-10 possesses the least tendency to lacquer deposition in a thin layer.

The anticorrosive properties of oils were studied on a steel shaft immersed in a mixture of distilled water and the test oil at 60°C for 24 h while continuously stirring the mixture according to GOST 19199-73. Tests established the absence of corrosion on the steel shaft in all the test oils containing the additives. Slight corrosion was noticed in oil KS-19.

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TABLE 1

<table>
<thead>
<tr>
<th>Oil</th>
<th>Kinematic viscosity (mm²/sec) at °C</th>
<th>Flash point (in an open crucible), °C</th>
<th>Diameter of oxidation spot, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>40</td>
<td>-5</td>
</tr>
<tr>
<td>KZ-10</td>
<td>9.36</td>
<td>79.18</td>
<td>Not del.</td>
</tr>
<tr>
<td>K-19</td>
<td>17.9</td>
<td>237.9</td>
<td></td>
</tr>
<tr>
<td>KS-19</td>
<td>21.08</td>
<td>264.4</td>
<td>13 809</td>
</tr>
</tbody>
</table>

Note: Pour point of all the above oils in −15°C.

![Graph](image1)

Fig. 1. Change of acid number K of different oils in time τ at 140°C: 1) KS-19, 2) Kp-8, and 3) KZ-10.

![Graph](image2)

Fig. 2. Dependence of the amount of lacquer G₁ deposited in a thin layer of oil at 200°C on time τ. Curves 1, 2, and 3 are as in Fig. 1.

For a comprehensive evaluation of the tendency of oils to carbon deposition, a special stand was designed for testing the oil at air injection temperatures up to 210°C. The stand was designed on the basis of a 2-cylinder single-stage compressor. The stand was fitted with systems for automatic control of compressed air pressure, compressor cooling and additional oil injection for forcing the carbon deposition process. Special carbon depositing devices were installed in the stand.

Tests were carried out under the following conditions: injection temperature 210°C, air pressure 0.79 MPa, amount of oil injected into the suction line of compressor 2 ml/h, and test duration 40 h. The test results given in Table 2 show that the anticarbon-depositing properties of oil KZ-10 are considerably superior to those of compressor oil KS-19.

The effect of the oil on the wear of compressor components was studied in a commercial stand designed on the basis of compressor 2VUI-2.5/13MI designed for atmospheric air compression to 1.2 MPa. The compressor output is 2.45 m³/min and injection temperature 180°C.