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EFFECT OF RUNNING COATINGS ON TRIBOLOGICAL PROPERTIES OF STRANGTHENED STEEL SURFACES

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Summary

There are represented the results of the laboratory studies concerning the effect of the running coatings made of soft anti-friction metals applied by the process of electroerosive alloying on the surfaces of rings made of P6M5 and 12X18H10T steels and having titanium nitride coatings applied by the method of condensed ion bombardment. The purpose of this work is to investigate the effect of the running electroerosive coatings on the steel sliding surface tribological characteristics obtained with the use of various methods for forming those surfaces. To study the effect of the combined running coatings, which have been formed by electroerosive alloying methods, on the tribological properties of the sealing ring surface layers strengthened by different methods, there were tested various series of specimens. Forming the titanium nitride coatings on the steels of 12X18H10T and P6M5 grades by the condensed ion bombardment method increases the values of microhardness of the surface layers, respectively, up to 16.4 and 18.3 GPa. The values of the frictional force and coefficient of friction increase with increasing the loads for all the series of the specimens. For all the series of the specimens, the combined running coatings applied by electroerosive alloying method reduce the values of the frictional force and frictional coefficient. The greater efficiency of the running coatings having the composition of Pb + Ag + Cu + Ag as compared to that of Pb + Cu occurs only at the load of 4.91 N when the frictional force and frictional coefficient of the steel ball over the surface with the combined electroerosive coating on 12X18H10T steel are equal 0.03 and 0.38 N and 0.007 and 0.078, respectively. As tested under various loads, all the series of the specimens with running coatings are characterized by the availability of the normal friction with small mechanical wear, except for the sample made of 12X18H10T steel with the coating formed of titanium nitride, wherein with increasing the load of 4.91 to 9, 81 N and more there was occurred an abrasive wear.