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Tetiana Roik, Iuliia Vitsiuk
(Department of Technology of printing production and Reprography Department, Publishing Printing Institute, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kiev, Ukraine)

NEW COMPOSITE PARTS FOR PRINTING EQUIPMENTS

The objective of the present paper is to research bearing nickel alloy EP975-based composite materials with CaF_2 additions for heavy-duty conditions and to study the formation physical mechanical and tribotechnical properties of new bearings.

Powders of the high-alloyed nickel alloy EP975 have been produced by powder spraying method of melted metal by argon stream. Dispersed metal drops are crystallized as spherical particles with dimensions from 10 to 750 μm. Usually optimum dimensions of fractions are in the range of 37-250 μm . In our case powders of alloy EP975 were of 50-250 μm. Chemical composition of materials was next, mass.% C - 0.038-0.076; W - 8.65-9.31; Cr - 7.6- 9.5; Mo - 2.28-3.04; Ti - 1.71-2.09; Al - 4.75-5.13; Nb - 1.71-2.59; Co - 9.5-11.4; Ni – basis, CaF_2 - 4.0-8.0 [1].

The method of hot isostatic-pressing (HIP) was used manufacture new bearing materials because the traditional technology of powder metallurgy doesn't ensure minimum porosity.

HIP with a next heat treatment have been ensured the formation of phases in a structure, which increase physical-mechanical properties of materials (combination of strength and plasticity) and improve operating reliability of a friction part.

We have developed a new effective bearing materials based on Ni alloy EP975–CaF_2 system with high physical mechanical and tribotechnical properties that performs well in more severe conditions than known sintered alloy [1].

The new materials have an advantageous level of tribotechnical characteristics due to the tribofilms formed on the contact surfaces by dragging of calcium fluoride to cover the entire friction area.

The full-scale industrial tests of EP975–CaF_2 bearings showed increase in wear resistance by a factor up to 10 compared with known bearings in friction units of Heidelberg Speedmaster SM-102-FPL and KBA Rapida-105 high speed printing machines.

REFERENCES

1. New Composite Materials of the friction parts for printing machines/ P.O. Kyrychok, T. A. Roik, A. P. Gavrish, A. V. Shevchuk, Iu. Iu. Vitsuk: Monograph. - NTUU „KPI", Kyiv. – 2015. - 428 p.