STUDY ON THE ABILITY OF OPERATION OF BEARINGS WITH SLIP FRONTALLY SUPPLIED WITH LUBRICANT

Valeriu Certan[1], Vasile Rata-Muntean[2]

[1]Technical University of the Republic of Moldova, certanv@hotmail.com
[2] "Stefan cel Mare" University of Suceava, Romamia

Abstract: *Starting from O. Reynolds's equation for pressure in film of a radial bearing with slip with circular movement of length, the present paper presents the study of the main characteristics which lead to establishing their abilities to operate.*
Based on the results obtained, the technological design and working parameters will be optimized to ensure operating in a fluid regime of friction.

Keywords: *bearings, hydrodynamic lubrication, pressure, lubricant spin, the thickness of the lubricant film.*

1. Consideraţii generale

Slip bearings find their application almost in every machine and appliance. The reason for the interest toward their study is that a lot of questions have appeared when researching the operating process of the bearings and not many satisfactory answers.

The criteria to assess the performance of the construction of a slip bearing is formed by analysing some hydromechanics characteristics with a mutual connection between them, which estimate the thermal stress, wear resistance, fatigue durability of the assembly spindle-bearing shell.

Among the most important hydromechanics characteristics there is the instantaneous value of minimum thickness of the lubricant layer (h_{min}), and the maximum value of hydrodynamic pressure, instant losses and power environments of friction, the intake of lubricant which drains through the front of the bearing, the temperature from the lubricant layer.

Optimal operating regime of slip bearing is the fluid lubrication regime, where the contact between the spindle and the bearing shell is guaranteed; in this case the wear is excluded and the coefficient of friction becomes minimum. This operation mode of the bearing requires a continuous supply of lubricant.

In case the quantity of lubricant is insufficient, then the slip bearing will work in a semiliquid regime of friction, which can lead to a release of heat resulting in the increase in temperature of the lubricant and spindle-bearing shell assembly. Also, this case leads to an excessive increase of wear.

The three basic problems in calculating slip bearings lubricated with liquids on the basis of hydrodynamic theory are well known, which are reduced to determination pressure in any point of the lubricant film. This pressure directly influences the functional capacity of radial bearings slip including bearings with radial circular movement supplied frontally with lubricant under pressure.

It is considered that the main criteria of assessing the ability to operate these bearings