Tension of the Surface Layer in Machining Hardened Steels

Karel Osička, Zuzana Fišerová, Jan Otoupalík, Josef Chladil
Faculty of Mechanical Engeniering, Brno University of Technology, Technická 2896/2, 616 69 Brno. Czech Republic.
E-mail: osicka@fme.vutbr.cz, y146256@stud.fme.vutbr.cz, y146257@stud.fme.vutbr.cz, chladil@fme.vutbr.cz

The article builds on the existing results of machining testing hardened bearing rings. Some significant results were already achieved in this area. Cubic boron nitride as cutting materiál has been tested and the results were published. Existing measurement proves that values which reaches prescribed level of tolerance IT 4 can be achieved in series production. The evaluation indicater of arithmetic average surface roughness profile deviation was reached in the range of Ra = 0.2 to 0.4. Cutting conditions have also been specified in a certain range of machining. The problem remained on surface integrity. Specifically, the state of the surface layer. Tensile and compressive stresses alternate just below the surface and their size depends on the machining method. The specific size of the pressure and tensile stresses can not be accurately determined. Their presence, however, is a tendency to the formation of surface defects such as microcracks. These microcracks may be the cause of further massive destruction of the surface. Detection of surface layer tension is the subject of this article.

Keywords: hardened steel, CBN, surface integrity, surface tension

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