

Possibility of determination of material machinability over tribological parameters by use of tribometer "Block on Disk"

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Abstract

Considering the fact that we are living in time of rapid development of new materials used in production of different products, new cutting fluids and lubricants with expressive ecology features, new materials and geometry of cutting tools suitable for new processing condition, we are putting great effort into development of new models of cutting process simulation, especially rapid models investigation and simulation on tribometer. Significant results in investigation of cutting fluids and lubricants tribological characteristic and hard tool coating have been attained in Laboratory for cutting process and tribology on Faculty of Mechanical Engineering in Kragujevac. Researching of materials workability is at the very beginning. Regarding this, begun investigations are based on research of tribological occurrence into region of contact of two body, block and disc, where one body is sliding through other in present of lubricant as third element. A block is made of material for cutting tool, a disc is made of material for working specimen, while achieved contact conditions (normal loading and sliding speed) are meeting real working conditions. Realized investigations on tribometer "Block on Disc" have had an aim to establish opportunity of investigation of materials workability by tribological parameters (coefficient of friction and width of wear scar on the block). By this examination with wide selection of contact conditions, the measurement of average friction coefficient and wear scar on the block was performed. Based on these results, material comparison has been obtained. Satisfied results has been obtained with this relative simplified model, and on the basis of this results it can be said that information about materials workability can be obtained by tribological examination on tribometer "Block on Disc". By comparison analysis of experimental results in real cutting condition and tribological investigations, it was shown that simulation of cutting process by tribometer "Block on Disc" can replace experimental investigation, which is related to the determination of tribological characteristics of cutting tools and workpieces, and also describes the machinability of materials in real condition of cutting. In the specific conditions, related to the material comparison, it is possible with sufficient accuracy to apply material indexes with respect to the friction coefficients and wear scar on the block gained by corresponded measurements by tribometer.