Mathematical Modeling and Optimization of Surface Roughness in Turning Process

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Abstract

The roughness of technical surfaces presents one of the most important criterions relating to the choice of machining process and cutting parameters in project processing. The article focuses on researching results of the roughness of treated surface depending on the cutting parameters characterized to the longitudinal turning process. In order to find the most suitable empiric model to describe the depending character of the roughness of treated surface the following elements have been taken into consideration: a circumferential component of the cutting speed, the depth of cut and a feed. The experiment with the steel 34CrNiMo6 (DIN) has been conducted and the central composite design of the second degree has been applied. Given results determined by regression analysis led to the empiric equation that is used for the purpose of the calculation of the average arithmetic roughness. In order to find a minimum values of surface roughness, optimization of the mathematical is done.