

STUDY THE EFFECTS OF MACHINING PARAMETERS ON TOOL TIP TEMPERATURE

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Abstract

The aim of this research work is to study experimentally the influence of depth of cut, cutting speed, cutting angle, feed rate, tool rake angle and work piece material type on the tool tip temperature during a turning process. Totally 9 experiments per material type were performed in order to measure the tool tip temperature. The experiments were obtained by varying one parameter while, the remaining three parameter were kept constant. Some of the research were done in estimating the tool wear, cutting force, cutting conditions, chip formation, tool rake angles, work piece material but none of them has performed in evaluating the tool tip temperature. So the influence of tool tip on different machining parameters is done in this research work. To increase the tool life, we made the optimization of machining parameters using Taguchi optimization method. In this study, the Taguchi method, a powerful tool of design optimization for quality, is used to find the optimal cutting parameters for turning operations. Tool angles were measured by Profile projector. Through this study, not only the optimal cutting parameters for turning operations are obtained, but also the main cutting parameters that affect the cutting performance in turning operations were evaluated. Experimental results are provided to confirm the effectiveness of this approach.

Keywords: Machining optimization; Taguchi technique.