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DEVELOPMENT OF AN EMPIRICAL MATHEMATICAL MODEL FOR EVALUATING WEAR OF T42 HSS DUE TO TURNING PARAMETERS USING TAGUCHI METHOD

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Abstract

Tool life is defined as machining time elapsed between two consecutive resharpenings. F. W. Taylor has given an empirical mathematical model for evaluating tool life for different values of cutting speeds. Cutting speed is one of the important factors affecting tool life, as it generates more heat causing more temperature of cutting zone. The wear of the tool increases as temperature of cutting zone increases. Tool wear is taken as one of the factor to evaluate tool life. As tool wear increases tool life decreases. In case of turning operation feed and depth of cut also play a role in increasing temperature, thereby increasing wear, reducing life of the tool. An effort is made in this paper to propose a model to evaluate wear of a new tool material T42 w.r.t. turning parameters i.e. cutting speed, feed and depth of cut. Taguchi's OA technique is used for finalizing number of experiments. The results obtained are confirmed by carrying out confirmation experiments.

Keywords: Tool wear, T42 HSS, Taguchi OA, empirical mathematical model