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Predictive Modeling of Flank Wear in Hard Turning Using the Taguchi Method

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Abstract : This paper presents the influence of cutting parameters (cutting speed, feed and depth of cut) on flank wear (VB) in turning of 52100 hard alloy steel using multilayer coated carbide insert under dry condition. Nine experiments were performed based on Taguchi's L9 orthogonal array. Analysis of variance (ANOVA) was used to determine the effects of the cutting parameters on flank wear. The results of the study revealed that the cutting speed (A) and feed rate (B) are the dominant factors affecting flank wear, while the depth of cut (C) has not a significant effect. The optimal combination of the cutting parameters for flank wear is found to be A1B1C1. The mathematical model for flank wear is found to be statistically significant. The predicted and measured values of flank wear are found to be very close to each other.

Keywords : flank wear, hard turning, Taguchi approach, optimization
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