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Dear **F. Kolahan**

We appreciate your active participation in the (X-Mech-2012) also thank you for presenting in this conference, entitled:

Application of Taguchi Technique and Grey Relational Analysis in Solving the Multi-objective Problem When Turning Austenitic Stainless Steel

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Application of Taguchi Technique and Grey Relational Analysis in solving the Multi-objective Problem when turning Austenitic Stainless Steel

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Abstract

Multi objective optimizing of machining processes is used to simultaneously achieve several goals such as increased product quality, reduced production time and improved production efficiency. The traditional Taguchi method is widely used for optimizing the process parameters of a single response problem. Optimization of a single response results the non-optimum values for remaining. But, the performance of the manufactured products is often evaluated by several quality characteristics. Under such circumstances, multi-characteristics response optimization may be the solution to optimize multi-responses simultaneously. In the present study, The Taguchi method is used to formulate the experimental layout, to analyze the effect of each parameter on the This article presents an approach which first combines grey relational analysis to convert the values of multi responses obtained from Taguchi method Taguchi method used to optimize process parameters, such as speed, feed, depth of cut, and nose radius on multiple performance characteristics, namely, material removal rate (MRR) and surface roughness (Ra) during turning of AISI 202 austenitic stainless steel using a CVD coated cemented carbide tool. Taguchi's L8 orthogonal array (OA) is selected for experimental planning. The experimental result analysis showed that the combination of higher levels of cutting speed, depth of cut, and nose radius and lower level of feed is essential to achieve simultaneous maximization of material removal rate and minimization of surface roughness. The ANOVA and F-tests are used to analyze the results. Further, a set of verification tests is also performed to verify the accuracy of optimization procedure in determining the optimal levels of machining parameters. The results indicate that Taguchi technique and grey relational analysis are quite efficient in determining optimal process parameters. The optimization of the process was performed in the following steps.

(a) Normalizing the experimental results of material removal rate and surface roughness for all the trials.

(b) Performing the Grey relational generating and to calculate the Grey relational coefficient.

(c) Calculating the Grey relational grade by averaging the Grey relational coefficient.