

OPTIMIZATION OF CUTTING PARAMETERS IN TURNING OPERATION OF EN353 ALLOY WITH CVD TOOL USING GREY BASED TAGUCHI METHOD

A. V. N. L. SHARMA¹ AND M. MURALIKRISHNA³

¹Prof.Department of Mechanical Engineering, Baba Institute of Technology and Sciences,

³Principal Visaka Institute of Technology and Sciences,

Abstract

This study investigated the multi-response optimization of the turning process for an optimal parametric combination to yield the minimum surface roughness and maximum material-removal rate (MRR) using a combination of a Grey relational analysis (GRA) and the Taguchi method. Nine experimental runs based on an orthogonal array of the Taguchi method were performed to derive objective functions to be optimized within the experimental domain. The objective functions were selected in relation to the parameters of the cutting process: surface roughness and MRR. The Taguchi approach was followed by the Grey relational analysis to solve the multi-response optimization problem. The significance of the factors on the overall quality characteristics of the cutting process was also evaluated quantitatively using the analysis-of-variance method (ANOVA). Optimal results were verified through additional experiments. This shows that a proper selection of the cutting parameters produces a high material-removal rate and with a better surface roughness.

Keywords : Grey relation analysis, Surface roughness and MRR.