



Impartial Compound Optimization of Parameters Using EDM Tool Rotation

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Abstract: Electrical discharge machining (EDM) remains unique of the advanced methods of machining. Most publications on the EDM process are directed towards non-rotational tools. Except rotation of the tool provides a good flush effect in the machining zone. Optimization of process parameters in rotary EDM to arrive at the best manufacturing conditions is an essential need for industries towards manufacturing of quality products at lower cost. This paper aims to investigate the optimal set of process parameters such as work piece polarity, current, pulse ON and OFF time and tool rotational speed in rotary EDM process to identify the variations in three performance characteristics such as material removal rate, tool wear rate and surface roughness value during machining of P20 die steel using copper electrode. Based on the experiments conducted using L18 orthogonal assortment, analysis has been carried out with Grey relational analysis. Response tables and graphs were used to find the optimal levels of parameters in rotary EDM process. Confirmation experiments were carried out to validate the optimal results. Thus the machining parameters for rotary EDM were optimized for achieving the combined

objectives of performance characteristics on the work piece material. The obtained results show that the Grey relational Analysis is being effective technique to optimize the machining parameters for EDM process. **Keywords:-** Electrical Discharge Machining (EDM), Material Removal Rate (MRR), Rotary EDM, Surface.

I. Introduction

Being systematic application of the design and analysis of experiments, Taguchi method can be used for the purpose of designing and improving the product quality. During the research and development in recent years, the Taguchi method has become a powerful tool for improving productivity so that high quality

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