MATHEMATICAL MODELING OF MRR FOR ELECTRICAL DISCHARGE MACHINING

A Major Project thesis Submitted in partial fulfillment of the requirement for the award of the degree of

Masters of Technology

in

Production Engineering

Submitted By:

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ROLL NO: 2K10/PRD/17

UNDER THE GUIDENCE OF

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CANDIDATE'S DECLARATION

I hereby declare that the work done in this project entitled **"MATHEMATICAL MODELING OF MRR FOR ELECTRICAL DISCHARGE MACHINING"** in the partial fulfillment for the award of degree of "MASTER OF TECHNOLOGY" with specialization in "PRODUCTION ENGINEERING" submitted to Mechanical Engineering Department of Delhi Technological University, Delhi is an authentic record of my own work carried out under the supervision of Dr. Vipin, Professor, Department of Mechanical Engineering, Delhi Technological University, Delhi. I have not submitted the matter in this dissertation for the award of any other Degree or Diploma or any other purpose whatsoever.

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CERTIFICATE

This is to certify that dissertation entitled **"MATHEMATICAL MODELING OF MRR FOR ELECTRICAL DISCHARGE MACHINING"** being submitted by **MANOJ KUMAR SINGH** in the partial fulfillment for the award of degree of "**MASTER OF TECHNOLOGY"** with specialization in "**PRODUCTION ENGINEERING"** submitted to **Department of Mechanical Engineering, Delhi Technological University, Delhi,** is a bonafide work carried out by him under my guidance and supervision.

The matter in this dissertation has not been submitted to any other university or institute for the award of any degree.

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ABSTRACT

The right selection of manufacturing parameters is one of the most important aspects in the electrical discharge machining operation as these conditions has important effect on material removal rate (MRR). In this work the experiments are conducted on the machining of EN 31 die steel with graphite electrode in electrical discharge machining (EDM). The EDM oil commercial grade has been used as dielectric fluid. The effect of various EDM parameters such as discharge current, T_{on} and T_{off} has been investigated to yield the response in terms of MRR. In this work mathematical models have been developed for relating the MRR with machining parameters like discharge current, T_{on}, and T_{off}. The optimum value has been determined with the help of main effect plot and Annova table. With the help of MINITAB 15 software mathematical modeling has been done. The optimum value for MRR has been determined.

Keywords: Electrical discharge machining (EDM), Material removal rate (MRR), ANNOVA (analysis of variance.

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