

Effect of process parameter on wire cut EDM using RSM method

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[R. Selvam](#), [M. Vignesh](#), [R. Pugazhenth](#), [G. Anbuche](#) & [M. Satyanarayana Gupta](#)

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Abstract

The article aims to estimate the importance of machining parameters for the performance measure material removal rate (MRR) in the Wire Electrical Discharge Machining (WEDM) processing of MONEL 400 K. Wire feed, Time On and Time Off (downtime) have been discovered to be more impactful in deciding the MRR criterion substantially. The significant contribution of relevant input parameters varies according to the objective response behaviour of the parameter. The effect of Time off is the inverse of Pulse on Time, and it leads to the increased MRR as Time off increases, but surface roughness decreases. The material was flushed away effectively during higher Time off, leading to good-quality machined components. It endeavoured to recognize the most

significant machining factors for experimentation, and the response surface methodology (RSM) strategy tracks down the best arrangement of boundaries for increasing the MRR. Parametric evaluation on WEDM of MONEL 400 K stands new in this study which many researchers fail to explore in detail followed by response surface methodology to analyse the results. The conformity tests were completed to assess the RSM strategy's expected outcome, proving promising. The results confirmed that the increased MRR of 0.06938 gm/min is obtained at the optimal level of pulse On Time of 10 μ s, down Time of 2 μ s, and wire feed rate of 4 m/min.

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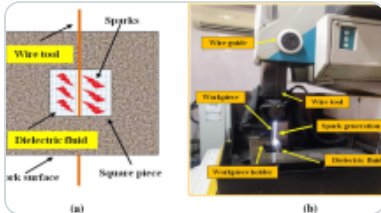
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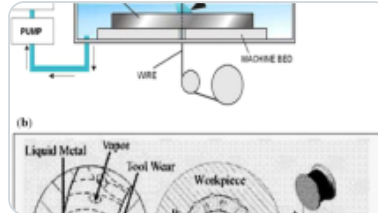
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Abbreviations

MRR: Material removal rate

WEDM: Wire electrical discharge machining

RSM: Response surface methodology

S/N: Signal to noise ratio

ANOVA: Analysis of variance

EDM: Electrical discharge machining

KW: Kerf Width

VIF: Variance inflation factor

μs : microseconds

m/min : metre/min

gm/min : gram/minute

V: voltage

A: Ampere

df: Degrees of freedom

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Author information

Authors and Affiliations

Department of Mechanical Engineering, St. Joseph's College of Engineering, Chennai, 600119, India

R. Selvam

Department of Mechanical Engineering, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Chennai, TamilNadu, 601103, India

M. Vignesh

Vels Institute of Science, Technology & Advanced Studies (VISTAS), Chennai, Tamil Nadu, 600117, India

R. Pugazhenth

Department of Mechanical Engineering, Saveetha school of Engineering, Chennai, Tamil Nadu, 602105, India

G. Anbuechezhiyan

Department of Aeronautical Engineering, MLR Institute of Technology, Hyderabad,
Telangana, 500043, India

M. Satyanarayana Gupta

Contributions

Conceptualization& Methodology: RS. Formal analysis and investigation: RP. Writing – original draft preparation: GA. Writing – review and editing: MV. Supervision: MSG

Corresponding author

Correspondence to [G. Anbucheziyan](#).

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