

## Optimization of Electrical Discharge Machining Parameters in Machining AISI D3 Tool Steel by Grey Relational Analysis

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**Abstract :** This study presents optimization of multiple performance characteristics [material removal rate (MRR), surface roughness (Ra), and overcut (OC)] of hardened AISI D3 tool steel in electrical discharge machining (EDM) using Taguchi method and Grey relational analysis. Machining process parameters selected were pulsed current  $I_p$ , pulse-on time  $T_{on}$ , pulse-off time  $T_{off}$  and gap voltage  $V_g$ . Based on ANOVA, pulse current is found to be the most significant factor affecting EDM process. Optimized process parameters are simultaneously leading to a higher MRR, lower Ra, and lower OC are then verified through a confirmation experiment. Validation experiment shows an improved MRR, Ra and OC when Taguchi method and grey relational analysis were used

**Keywords :** edm parameters, grey relational analysis, Taguchi method, ANOVA

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