

عنوان مقاله:

Grey-based Taguchi Technique for Solving the Multi-objective Problem When EDM Hard Worked Steel

محل انتشار:

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خلاصه مقاله:

In this paper Taguchi method has been employed to optimize Electrical Discharge Machining (EDM) process for 40CrMnMoS86 hot worked steel parts. The experimental data are gathered based on Taguchi L(36) design matrix. The tests are conducted under varying peak current (I), voltage (V), pulse on time (T(on)), pulse off time (T(off)) and duty factor (η). The effects of these input parameters are then determined on three important process output responses, namely; Surface Roughness (SR), Tool Wear Rate (TWR) and Material Removal Rate (MRR). Using these data and signal-to-noise (S/N) ratio analysis, the process parameters can be set to achieve desired surface roughness, tool wear and material removal rates. Next, analysis of variance (ANOVA) and F-test have been used to evaluate the relative significance of process variables affecting process outputs. A set of verification tests is also performed to verify the accuracy of optimization procedure in determining the optimal levels of machining parameters. The results indicate that Taguchi technique is quite efficient in determining optimal process parameters.

کلمات کلیدی:

Taguchi technique, Electrical Discharge Machining, Optimization, Analysis of variance, signal to noise

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