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Optimization of Surface Quality of Mild Steel Machined by Wire EDM Using Simulated Annealing Algorithm (Conference Paper)

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Abstract

One of the main machining characteristics that play vital role in determining the quality of engineering components is surface integrity. The fatigue strength, corrosion and wear resistance is enhanced by good quality surfaces of the work piece. The purpose of this research is investigating and optimizing the effects of three parameters: peak current (IP), wire speed (WS), and wire diameter (D) on surface quality of work piece in terms of roughness and hardness by wire EDM. The experimental plan was based on two level of full factorial design. The ANOVA analysis has been applied to identify the significance of the developed model. The results show that larger wire diameter give better surface integrity along with controlled variables such as low pulse peak current and high wire speed. The results have been used as input the Simulated annealing algorithm to determine the optimum value that can be achieved based on the scope of the research. © 2015 IEEE.

Author keywords

optimization; pulse peak current; Simulated annealing; surface integrity; wire diameter; wire EDM; wire speed

Indexed keywords

Engineering controlled terms: Algorithms; Carbon steel; Cermets; Engineering research; Optimization; Simulated annealing; Surface properties; Wear resistance

Corrosion and wear resistance; Engineering components; Machining characteristics; Peak currents; Simulated annealing algorithms; Surface integrity; Wire diameter; Wire-EDM

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