

Multi-Objective Optimization of Electric Discharge Machining for Inconel 718

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Abstract : Electric discharge machining (EDM) is one of the most widely used non-conventional manufacturing process to shape difficult-to-cut materials. The process yield, in terms of material removal rate, surface roughness and tool wear rate, of EDM may considerably be improved by selecting the optimal combination(s) of process parameters. This paper employs Multi-response signal-to-noise (MRSN) ratio technique to find the optimal combination(s) of the process parameters during EDM of Inconel 718. Three cases *v.i.z.* high cutting efficiency, high surface finish, and normal machining have been taken and the optimal combinations of input parameters have been obtained for each case. Analysis of variance (ANOVA) has been employed to find the dominant parameter(s) in all three cases. The experimental verification of the obtained results has also been made. MRSN ratio technique found to be a simple and effective multi-objective optimization technique.

Keywords : electric discharge machining, material removal rate, surface roughness, tool wear rate, multi-response signal-to-noise ratio, multi response signal-to-noise ratio, optimization

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