Using entropy weight, OEC and fuzzy logic for optimizing the parameters during EDM of Al-24% SiC\textsubscript{p} MMC

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\textbf{A B S T R A C T}

In this paper the multiple methodologies are used viz. Entropy weight measurement, Overall evaluation criteria (OEC), and fuzzy logic for optimizing the process parameters during Electrical discharge machining (EDM) process of Al-24% SiC\textsubscript{p} metal matrix composite (MMC). Three process parameters like as peak current, pulse on time and flushing pressure are considered as input variables whereas material removal rate, tool wear rate, radial over cut and surface roughness are response variables. Central composite design (CCD) is used as the design of experiment (DoE) for conducting the experiments using different combinations of input variables of three levels for predicting responses. The individual weightage of each response is calculated using the Entropy weight method and normalization of responses were carried out with the same weightage of responses using OEC. Finally fuzzy logic was used to obtain a single numerical index known as the Multi performance characteristics index (MPCI). The Analysis of Variance (ANOVA) was used to find the significances of process parameters on the responses. The second-order mathematical model was developed using response surface methodology for predicting the results. Moreover, a confirmation test was carried out to check the effectiveness of the presented approach.

\textbf{Keywords:}
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