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Fuzzy Modeling for Diametric Overcut in ECDM Process

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Abstract: The processes' modeling is an important aspect in the industry, since it allows achieving high productivity with energy and material savings. The hybrid process Electrochemical Discharge Machining (ECDM) has a wide applicability in industries such as automotive, aerospace, electronics and others. However, the process parameters variability breeds uncertainty in the process, thus a suitable option to model this process is through the fuzzy logic. In this work is presented a fuzzy model for the prediction of Diametral Overcut (DOC) on the machining of high strength steel (HSS) workpieces by using brass tool electrode. The input parameters are gap voltage (Vg), peak current (Ip) and frequency (F). For the fuzzy knowledge base was developed a 3-factor full factorial design with 2 levels (2^3), two replicas and 4 central points. The presented fuzzy model was able to predict the experimental results with more than 90% of accuracy through mean of maxima defuzzification method.

Keywords: Fuzzy logic, ECDM process, Diametral Overcut.