

عنوان مقاله:

Fatigue Life of Graphite Powder Mixing Electrical Discharge Machining AISI D2 Tool Steel

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خلاصه مقاله:

The present paper deals with the design of experimental work matrices for two groups of experiments by using Response surface methodology (RSM). The first EDM group was dealt with the use of kerosene dielectric alone, while the second was treated by adding the graphite micro powders mixing to dielectric fluid (PMEDM). The total heat flux generated and fatigue lives after EDM and PMEDM models were developed by FEM using ANSYS 15.0 software. The graphite electrodes gave a total heat flux higher than copper electrodes by (82.4 %). The use of graphite powder and both electrodes yielded more heat flux by (270.1 %) and (102.9 %) than the copper and graphite electrodes, respectively with use of kerosene dielectric alone. Using graphite electrodes and kerosene dielectric alone improved the WLT by (40.0 %) when compared with the use of copper electrodes. Whereas, using copper electrodes and the graphite powder improved the WLT by (66.7 %) compared with the use of graphite electrodes under the same machining conditions. Copper electrodes with graphite powder gave experimental fatigue safety factor higher by (30.38 %) when compared with using graphite electrodes and higher by (15.73%) and (19.77%) when compared with .using the copper and graphite electrodes and kerosene dielectric alone, respectively

کلمات کلیدی:

EDM, PMEDM, Graphite powder, RSM, ANOVA, FEM, AISI D2 Die Steel, WLT, Total heat flux, Fatigue Life, Fatigue safety factors

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