

Abstract

Main objective of this research is analysis of electrode materials that affect efficiency of electrical discharge machining on a silicon nitride. Copper and brass pipe electrodes were carried out in the experiment. Considered factors are electrode polarity, open load voltage, peak current and duty factor. The experimental design, Taguchi and analysis of variance (ANOVA), were used for analysis. Efficiency was considered by Material Removal Rate (MRR), Electrode Wear Ratio (EWR), and surface roughness. The results showed that a brass electrode give more MRR than a copper electrode. Negative polarity, 250 volts of open load voltage, 12.5 amperes of peak current, on-time is 6 microseconds and 50 percents of duty factor give the highest value of MRR. Conductive layers that were produced by both electrodes were investigated by Scanning Electron Microscope (SEM) and Electron Dispersive Spectrometer (EDS). A brass electrode gives less deviation of conductive layer's thickness than a copper electrode. Electrical resistivity of a conductive layer produced by a brass electrode give less value than that produced by a copper electrode.