Systematic Study of Micro Arc Oxidation Processes for Corrosion Resistance of Aluminium Alloys

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Micro Arc Oxidation (MAO) has been considered as a new technique to form ceramic coatings on Aluminium alloys for corrosion resistances. A number of studies have been carried out for using of micro arc oxidation (MAO) technology for depositing ceramic coatings on aluminium alloys for corrosion resistances. However, very few have focused on the optimization of the MAO process parameters. In this study, Taguchi experimental analysis method was used to systematically investigate the effects of four parameters (deposition time, frequency, current density, and concentration of electrolyte) with three levels on the corrosion resistance of coatings. Potentiodynamic polarization measurements were conducted to determine the corrosion resistance of the samples. The percentage contribution of each factor was determined by the ANOVA. The optimum coating parameters that affected the corrosion resistance were determined by using Taguchi method. The results showed that which parameter was the most significant factor affecting on the coatings's corrosion resistance.

Keywords
Micro Arc Oxidation
Aluminium Alloys
Taguchi Method
Corrosion Resistance