

## Plasma electrolytic oxidation of metals

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Plasma electrolytic oxidation (PEO) method is one of surface treatment methods conducted electrochemically in environmentally friendly solutions which can provide hard coatings on metals, such as aluminum, magnesium, titanium etc. The formation behavior of PEO films are dependent mainly upon the solution composition, form of applied current and compositions of the substrate. Anions of  $\text{OH}^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{SiO}_3^{2-}$ ,  $\text{CO}_3^{2-}$ ,  $\text{F}^-$  and  $\text{AlO}_2^-$  are frequently used for the PEO coating formation and a.c. and pulse currents are employed to form more uniform PEO films. The morphology of PEO films are closely related with the size, color and type of arcs generated during the formation of PEO films. In this presentation, generation behavior of micro-arcs and growth behavior of PEO films on Al and Mg alloys are examined during the application of d.c. and pulse currents in aqueous alkaline solutions, and the relationship between the arc generation behavior and morphologies of the PEO films formed.