Special Issue

Plasma Electrolytic Oxidation

Message from the Guest Editor

Plasma Electrolytic Oxidation (PEO), also known as Micro Arc Oxidation, is used to obtain porous coatings on metals such as aluminum, magnesium, titanium, tantalum, niobium, and their alloys. The first works on electrolyte discharge phenomena are dated as early as 1880, and the practical use of oxidation of aluminum by PEO started in 1970. These two dates should be recognized as the beginning of the Plasma Electrolytic Oxidation age. Afterwards, that technology was patented and introduced to industrial applications in the 1980s. Most important is that PEO coatings formed on metals and alloys may be enriched using selected elements, originating from the electrolytes used. The chemical and phase compositions, as well as porosity and the thickness of the PEO coating depend on the values of the DC and AC voltages used for that treatment. The expected applications of PEO coatings can be found in aerospace and space industries, as well as in the production of biomaterials and automotive catalytic converters. Investigations into PEO processing and the physical–chemical and mechanical properties of these porous coatings are the objective of this Special Is

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Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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