Effect of Pulse Current on Formation Behavior of Plasma Electrolytic Oxidation Films on Al Alloy

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Inthis study, effect of pulse current width on the arcing behavior during the formationof PEO filmson Al 1050 alloy was investigated by in-situ observation of arcs generated. PEO films wereformed in 0.4 M Na_2SiO_3 solution containing 0.4 M ofNaOH. At 50 ms of pulse width, micro-arcs were generated randomly over the wholesurface. At more than 100 ms of pulse width, arcs were observed to generate locally on a specificsite as a form of group arcs. The group arcs were initiatedat the edge of specimen and propagated linearly towards the center of specimens. The movingspeed of group arcsdecreased with increasing pulse width. The morphology, thickness, surface roughness, film hardness of PEO films were examined and discussed in viewof the arcing behaviors, which is dependent on the pulsecurrent width.