Short Communication

Fabrication of Micro Annular Grooves on a Cylindrical Surface in Aluminum Alloys by Wire Electrochemical Micromachining

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Micro grooves, as a prominent microstructure in micro instruments, have been well applied in various industrial advanced applications. This study addressed to wire electrochemical micromachining (WECMM) of micro annular grooves on a cylindrical surface in an aluminum rod. By employing neutral electrolyte of sodium nitrate solution, the process would inevitably generate passive film on the surface at low current density. Thus, the dissolution characteristics of aluminum were experimentally analyzed by polarization curve. Under the optimized parameters, arrayed micro annular grooves with width of 100 μm , pitch of 80 μm and depth of 100 μm were fabricated on an aluminum rod with a diameter of 3 mm. This study revealed that WECMM is a promising method to produce micro annular grooves on a cylindrical surface in aluminum alloys.

Keywords: wire electrochemical micromachining, aluminum alloy, dissolution characteristic, micro annular grooves

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