Short Communication

Effect of Microstructures on Surface Properties of Electrochemical Machining of Ti-5.6Al-2Zr-4.8Sn-1Mo-0.35Si-0.7Nd Alloys

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Electrochemical machining (ECM) has been widely used to process high-temperature titanium alloys, however, few studies have investigated the ECM of Ti-5.6Al-2Zr-4.8Sn-1Mo-0.35Si-0.7Nd (Ti60). This study examined the differences in the microstructures of the Ti60 forged with two different methods, focusing on the influences of the material microstructures on the surface morphology produced by ECM. The β -forged Ti60 reveal a small and staggered grains and a more uniform distribution of the α and β phases, and the surface morphology produced by ECM is better than that of the conventional forged Ti60. ECM experiments of the Ti60 were also carried out to analyze the influence of the current density on the surface roughness. The results show that the surface roughness of the Ti60 produced by ECM is adversely affected when the current density is either small or increases considerably. The best surface quality of the two kinds of Ti60 is obtained when the current density is about 50 A/cm².

Keywords: Electrochemical machining, Ti-5.6Al-2Zr-4.8Sn-1Mo-0.35Si-0.7Nd, Microstructure, Current density

NOMENCLATURE

ECM = Electrochemical Machining

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