

Effect of Zr Addition to Aluminum Grain Refined by Ti+B on Its Wear Resistance after Extrusion Condition

Authors : Adnan I. O. Zaid, Safwan M. A. Alqawabah

Abstract : Review of the available literature on grain refinement of aluminum and its alloys reveals that little work is published on the effect of refiners on mechanical characteristics and wear resistance. In this paper, the effect of addition of Zr to Al grain refined by Ti+B on its metallurgical, mechanical characteristics and wear resistance both in the as cast and after extrusion condition are presented and discussed. It was found that Addition of Zr to Al resulted in deterioration of its mechanical strength and hardness, whereas it resulted in improvement of both of them when added to Al grain refined by Ti+B. Furthermore it was found that the direct extrusion process resulted in further increase of the mechanical strength and hardness of Al and its micro-alloys. Also it resulted in increase of their work hardening index, n , i.e. improved their formability, hence it reduces the number of stages required for forming at large strains in excess of the plastic instability before Zr addition.

Keywords : aluminum, grain refinement, titanium + boron, zirconium, mechanical characteristics, wear resistance, direct extrusion

Conference Title : ICEMA 2015 : International Conference on Engineering Materials and Applications

Conference Location : Istanbul, Türkiye

Conference Dates : August 17-18, 2015