

Author's Accepted Manuscript

A comprehensive analysis of extrusion behavior, microstructural evolution, and mechanical properties of 6063 Al–B₄C composites produced by semisolid stir casting

Amir Pakdel, Agnieszka Witecka, Gauthier Rydzek, Dayangku Noorfazidah Awang Shri, Valeria Nicolosi



PII: S0921-5093(18)30298-3
DOI: <https://doi.org/10.1016/j.msea.2018.02.080>
Reference: MSA36167

To appear in: *Materials Science & Engineering A*

Received date: 25 January 2018
Revised date: 20 February 2018
Accepted date: 21 February 2018

Cite this article as: Amir Pakdel, Agnieszka Witecka, Gauthier Rydzek, Dayangku Noorfazidah Awang Shri and Valeria Nicolosi, A comprehensive analysis of extrusion behavior, microstructural evolution, and mechanical properties of 6063 Al–B₄C composites produced by semisolid stir casting, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.02.080>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A comprehensive analysis of extrusion behavior, microstructural evolution, and mechanical properties of 6063 Al–B₄C composites produced by semisolid stir casting

Amir Pakdel^{a,b,*}, Agnieszka Witecka^c, Gauthier Rydzek^b, Dayangku Noorfazidah Awang Shri^d,
Valeria Nicolosi^{a,e}

^a Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN) and Advanced Materials Bio-Engineering Research Centre (AMBER), School of Chemistry, Trinity College
Dublin, Dublin, Ireland

^b World Premier International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan

^c Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland

^d Faculty of Mechanical Engineering, Universiti Malaysia Pahang, Pekan, Pahang, Malaysia

^e I-FORM Advanced Manufacturing Research Centre, University College Dublin, Dublin, Ireland

*Corresponding author's E-mail: pakdela@tcd.ie

Abstract

In this study, composites of aluminum alloy 6063 reinforced with 10 wt.% boron carbide microparticles were successfully fabricated by a combination of spark plasma sintering and stir casting methods, followed by hot extrusion. A systematic study on the relationship between extrusion process variables (i.e. extrusion ratio, temperature, and punch speed) and porosity, particle refinement, particle distribution and consequently tensile properties and fracture behavior of the composites was performed. Extensive electron microscopy analysis and tensile testing of the

Download English Version:

<https://daneshyari.com/en/article/7972846>

Download Persian Version:

<https://daneshyari.com/article/7972846>

[Daneshyari.com](https://daneshyari.com)