

Accepted Manuscript

High Shear Dispersion Technology prior to Twin Roll Casting for High Performance Magnesium/SiC_p Metal Matrix Composite Strip Fabrication

Xinliang Yang, Yan Huang, Nilam S. Barekar, Sanjeev Das, Ian C. Stone, Zhongyun Fan

PII: S1359-835X(16)30256-1
DOI: <http://dx.doi.org/10.1016/j.compositesa.2016.07.025>
Reference: JCOMA 4376

To appear in: *Composites: Part A*

Received Date: 24 May 2016
Revised Date: 24 July 2016
Accepted Date: 30 July 2016



Please cite this article as: Yang, X., Huang, Y., Barekar, N.S., Das, S., Stone, I.C., Fan, Z., High Shear Dispersion Technology prior to Twin Roll Casting for High Performance Magnesium/SiC_p Metal Matrix Composite Strip Fabrication, *Composites: Part A* (2016), doi: <http://dx.doi.org/10.1016/j.compositesa.2016.07.025>

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 proof before it is published in its final 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.

**High Shear Dispersion Technology prior to Twin Roll Casting for High
Performance Magnesium/SiC_p Metal Matrix Composite Strip Fabrication**

Xinliang Yang¹, Yan Huang¹, Nilam S. Barekar¹, Sanjeev Das², Ian C. Stone¹ and

Zhongyun Fan¹

¹BCAST, Brunel University London, Uxbridge, UB8 3PH, UK

²Department of Metallurgical Engineering, National Institute of Technology Raipur,

G.E. Road, Chhattisgarh, 492010, India

Abstract: SiC particulate (SiC_p) reinforced AZ31 magnesium alloy composite strips were produced by a novel process. In the process, a high shear technique was utilised to disperse the reinforcing particles uniformly into the matrix alloy, and AZ31/5vol%SiC_p slurry was solidified into thin strip by a horizontal twin roll caster. The experimental results showed that the AZ31/5vol%SiC_p strip obtained with high shear treatment exhibited a significantly refined microstructure and uniform distribution of reinforcing SiC particles. High cooling rate in the TRC process was also considered to contribute to the grain refinement of the matrix alloy, together with the possible heterogeneous nucleation effect of the reinforcing particles. The mechanical properties of the high shear treated composites strips showed enhanced modulus, yield strength and ductility by hardness and tensile tests. The experimental results were discussed in terms of the microstructural features and the macroscopic reliability, where necessary, analytical and statistical analyses were conducted.

Download English Version:

<https://daneshyari.com/en/article/7890178>

Download Persian Version:

<https://daneshyari.com/article/7890178>

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