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Authors: Georgios Kaisarlis, Efstratios Tsolakis, Georgios Vasiliou, Vasileios Spitas, Zhandos Tauanov, Vassilis Inglezakis, Grigorios Itskos, Christos Spitas



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Efficient oscillating micro-grid mixing of CFA-aluminium composite melts

Georgios Kaisarlis ⁽¹⁾, Efstratios Tsolakis ⁽²⁾, Georgios Vasiliou ⁽¹⁾, Vasileios Spitas ⁽¹⁾, Zhandos Tauanov ⁽³⁾, Vassilis Inglezakis ⁽³⁾, Grigorios Itskos ⁽⁴⁾, Christos Spitas ^(3,5,c)

⁽¹⁾ School of Mechanical Engineering, National Technical University of Athens,

⁽²⁾ European Organisation for Nuclear Research (CERN),

⁽³⁾ School of Engineering, Nazarbayev University,

⁽⁴⁾ College of Engineering, Purdue University,

⁽⁵⁾ Ageing Centre, Delft University of Technology,

^(c) Corresponding author: cspitas@gmail.com

Abstract

An analytical, numerical and experimental study is presented on the deagglomeration and dispersion of fine coal fly ash (CFA) reinforcing particles in an A380 aluminium matrix using a piston-actuated oscillating micro-grid mixing method with a specially designed grid geometry. Based on real-time measurement of the piston force, the apparent viscosity of the melt and the effectiveness of the deagglomeration are measured indirectly. The oscillating micro-grid mixing process is shown to be considerably more time-efficient than comparative stir-casting processes currently employed, leading to a two-fold or three-fold reduction in processing time

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