Purdue School of Materials Engineering and Purdue Center for Metal Casting Research

Present

Peter G. Winchell Distinguished Lecture Series Seminar

Date: Friday, March 1, 2013
Time: 3:30 Refreshments
3:45 Seminar
Place: ARMS 1010

PURDUE MATERIALS ENGINEERING

Dr. Daan Maijer

Associate Professor
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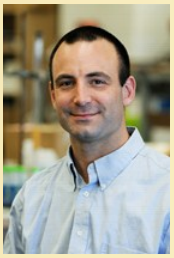

Through-Process Modelling for Cast Aluminum Alloy Automotive Components: An illustrative example of Integrated Computational Materials Engineering

ABSTRACT

Through-Process Modelling (TPM) is a recently-developed materials engineering design approach that can be used to enhance component performance by taking the complete manufacturing process into consideration. In TPM, advanced modelling tools are applied to investigate the entire manufacturing cycle through a "virtual" fabrication process. Following this approach, models of heat transfer, stress development, microstructure, and defect formation are coupled to predict the in-service performance of a fabricated component.

In this talk, an overview of the TPM methodology will be presented with emphasis on the data needed to successfully accelerate materials and component development with this approach. Two example applications focused on cast aluminum alloy automotive components will be discussed and used to highlight the capability of the TPM methodology.

SHORT BIO

Dr. Daan M. Maijer is the Director of the Integrated Engineering Program and an Associate Professor in the Department of Materials Engineering at The University of British Columbia. He received his B.A.Sc. and Ph.D. in Metals and Materials Engineering from The University of British Columbia in 1994 and 1999, respectively. As one of the principal researchers in the Materials Processing Group in the Advanced Materials Process Engineering Laboratory, his research aims to develop insight into the industrial processes used to transform metals; in particular, casting processes, to improve product quality and process productivity. This research often involves the development of mathematical models that capture the complex physical phenomena active in these processes and relies on laboratory experiments and\or plant trials to provide the data necessary for model development and validation. This research is industrially oriented and has led to collaborations with companies within Canada (Alcan International Ltd., Canadian Autoparts Toyota Inc., and Timminco Ltd.) and abroad (Corus, Titanium Metals Corp. and The Timken Co.).

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