

8th International Conference on Physical and Numerical Simulation of Materials Processing (ICPNS)

14–17 October 2016

Seattle, Washington | Hosted by Purdue University

**SESSION 6: LIGHT ALLOYS, MARITIME HALL**

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**SATURDAY, OCTOBER 15, 2016**

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## **Numerical simulation of the influence of ceramic preform on the infiltration process of metal matrix composites**

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### **ABSTRACT**

Modeling of the infiltration process plays an important role in casting of metal matrix composites (MMCs). In the present work, a mathematical model was used to describe the casting process in producing ceramic reinforced MMCs. The pressure distribution in the mold cavity was studied, and the pressure drop mainly takes place in the ceramic preform. Particle size affects the pressure drop a lot when it is smaller than 40  $\mu\text{m}$ . The temperature distribution in the mold and cavity together with flow front evolution in different time was also obtained. It is found that in the flow front, the temperature experienced the most decrease. The solidification study indicated that ceramic preform lets the pure aluminum solidified faster than usual. It is wise to increase pouring temperature to produce metal matrix composites.

**KEYWORDS:** numerical simulation, metal matrix composites, infiltration process, porous media, ceramic preform