

4th International Conference and Exhibition on **Materials Science & Engineering** September 14-16, 2015 Orlando, USA

The effect of pressure on feeding characteristic and porosity formation of A356 alloy

Jae-Ik Cho, Cheol-Woo Kim and Min-Kyung Park
Korea Institute of Industrial Technology, Republic of Korea

The use of externally applied pressure during filling and solidification has long been used in industries. However, the effect of applied pressure on filling and solidification of aluminum casting alloys and the influence on microstructure has not been adequately studied. It is generally well known that pressure is one of essential parameters which can influence both the solidification mode of aluminum and feed metal transfer. Therefore, in this study, the effects of applied pressure during filling and solidification of A356 alloy were investigated. A356 alloy is one of the long freezing range alloys and known to exhibit dispersed porosity which is well recognized factor affecting ductility, fracture toughness and fatigue resistance. The pressure was applied at the riser by using nitrogen gas inside of pressure vessel with the pressure range of up to 10 bars. The result showed significantly improved effective feeding of aluminum by exhibiting lowered shrinkage defects near the riser. Pressure also affect the solidification of A356 alloy by forming less porosity and reduced dendrite arm spacing. While there was no notable influence of pressurization in the phase formation of A356 alloy, the porosity level of the casting was only about 0.3% which was more than 66% of reduction in porosity.

Biography

Jae-Ik Cho has completed his MS in 1999 and PhD in 2003 at the University of Wisconsin-Madison and currently works at the Korea Institute of Industrial Technology as a principal researcher since 2004. He has published more than 25 papers and in journals and has been serving as an Editorial Board Member of Korea Foundrymen's Society.

uwjaeik@kitech.re.kr

Notes: