Influence of High-Pressure Die-Casting Second Stage Parameter on Structure Of AlSi9Cu3(Fe) Alloy

Łukasz Pałyga, Mateusz Stachowicz, Kazimierz Granat
Department of Foundry Engineering, Plastics and Automation, Wrocław University of Technology, Wybrzeże Wyspiańskiego 25, 50-370 Wrocław, Poland. E-mail: mateusz.stachowicz@pwr.edu.pl

In the paper, results of a research on influence of piston stroke rate on structures of AlSi9Cu3(Fe) (EN AB-46000 group) castings manufactured at constant intensification pressure of 290 bar are presented. Relation between piston speed (0.3- 2.3 m/s) and casting structure was evaluated after a series of trial high-pressure castings. The examinations were carried-out on properly prepared samples taken from the castings in places with the largest cross-section area. The effect of pouring rate was evaluated on the grounds of metallographic observations on a light microscope and a scanning electron microscope. It was found that larger grains of the very hard phase solidify at low piston speed between 0.3 and 0.75 m/s. Higher piston speed results in finer casting structure and in refinement of particles of intermetallic Fe-Mn phase, which is beneficial for usable properties of the castings.

Keywords: pressure die casting, structure, silumin, SEM, 2nd injection stage

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