Effect of Low Pressure Application during Solidification on Microstructure of AlSi Alloys

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This study investigated the effects of squeeze parameters on the properties of squeeze castings and the optimum parameters for producing squeeze castings from Al-Si alloy. It also compared the properties of the squeeze castings with those of chill castings. Squeeze castings were made from AlSi7Mg0.3 alloy using pressures of 15-22.5-30MPa with the alloy poured at 680, 700, 720 and 740°C into a die preheated to 150, 200 and 250°C. Squeeze time was 10s. At the pressure effect during crystallization there is possible to observe the refinement of eutectic silicium with the increasing pressured. Eutectic Si is excreted in clusters in comparison with non-influenced structure. There comes to increasing of failure strength and mainly of elongation. The hardness of investigated samples was not changed markedly. At the pressure of 15 MPa there comes to inadequate pressure influence, what causes the creation of shrinkage in the longitudinal part of the sample. This decreases the mechanical properties.

Keywords: microstructure, low pressure, alloy AlSi7Mg0.3

Acknowledgements

This work was created within the solution of the Operational Programme for Research and Development of ITMS code 26220220047. The authors thank the Grant Agency for support.

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Paper number: M201473