

Investigation on microstructure and mechanical properties of squeeze cast Al-Si alloys by numerical simulation

ABSTRACT

Since squeeze casting process is considered as a new technology for light alloys like aluminum and magnesium, more basic research is required for a scientific understanding of the practice. In distinct, as a cost-effective and resource-efficient tool, advanced numerical modelling in conjunction with dynamic boundary conditions and capabilities of predicting the formation of casting defects have to be fully developed for the optimization of squeeze casting processes. In squeeze casting, an external pressure is applied to molten metal before, during and after its solidification, which makes the condition at the casting die interface different from other typical casting techniques. In this paper, Finite Difference Method (FDM) is used to investigate the effect of heat transfer during squeeze casting process and the relationship between casting temperature and solidification on Al-Si alloys.

Keyword: Anycasting; Microstructure properties; Numerical simulation; Squeeze casting