Modification effect of Europium in Al-Si alloys at different solidification conditions

Modification is an important process in casting of Al-Si alloys to improve/optimize the mechanical properties (ductility, strength, heat treatability). Through this, blocky and angular eutectic silicon phases are converted into fine rounded and coralline structures. A typical modification is obtained using Strontium or Sodium, however, rare earth elements are other candidates for that. Regarding this, Europium has shown a certain modification effect and seems to be a promising alternative to the usual modifying elements [1].

Although some researches have been done to study the modification mechanisms of Europium [2], some fundamental aspects like effect of cooling rate on the modification potential, quantity optimization based on the casting process and occurrence of fading effect have not been investigated.

In this thesis, the effect of Europium content on the modification of Al-Si alloys in different casting processes will be observed. Furthermore, the optimized melt processing for utilization of Europium will be studied.

Your Profile

- Active master student of materials / metallurgical engineering
- Ability to start the project immediately
- Possible background in casting

Reference


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