Institute of Materials Science, Joining and Forming
Kopernikusgasse 24/I, 8010 Graz

Announcement of a Master's Thesis, 03.12.2018

Determination of the effect of the quenching rate on the age-hardenability of Al7Si0.5CuMg

Description

Al-Si alloys are an important group of alloys that are widely used in both cast and wrought form, especially the alloy to be investigated is in the industry used for cylinder heads, due to its lightweight in comparison to traditional steel. The age hardenable alloys are routinely heat treated to the T6 condition to develop adequate strength. The age hardening response of the alloys with respect to the to the cooling rate is critical for attaining optimal alloy performance. A T6 heat treatment usually involves, solution treatment at a relatively high temperature, quenching to room temperature and age hardening. To optimize these stages, it is crucial to know the processes happening in the microstructure.

Objective is to determine the influence of the quenching rate on the materials ability to harden during aging and to determines dynamic precipitation as function of cooling rates in an aluminum cast alloy.

Tasks

- Literature report
- Hot tensile tests
- SEM, EDS
- Data interpretation

Organization

Supervisor: Dipl.-Ing. René Wang (rene.wang@tugraz.at)
Cooperation partner: Nemak Linz GmbH
Prerequisites: Master student of Advanced Materials Science or Mechanical Engineering (MB, WIMB, PSM)
Duration: as of now for min. 6 months
Location: Modelling and Simulation Group, Brockmanngasse 29, 8010 Graz
Reward: € 2.000 + € 500 performance bonus for an excellent success

Further information

- For further information, please contact the secretariat of the institute or the supervisor.
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