Master thesis (German or English)

Topic: **Modell development to predict the modification of Al-Si cast alloys regarding their electrical conductivity**

Start: **Start of 2025**

Description: Aluminium as a material is characterized by high electrical and thermal conductivity in combination with a favourable strength-to-density ratio, which makes the material ideal for use in lightweight constructions. Alloying elements are essential for increasing the mechanical properties and castability.

Silicon in particular plays a decisive role in casting alloys. The shape of the eutectic silicon and other precipitates can be changed by refining elements in order to influence the conductivity and also the mechanical properties. In this work, a model is to be developed on the basis of data already collected and supplementary additional tests that maps the required refinement content as a function of the composition and cooling rate of Al-Si casting alloys.

For this purpose, data from gravity die casting tests and high pressure die casting tests of different wall thicknesses of several refined alloys are to be considered and evaluated. The required data for high pressure die casting tests and gravity die casting tests will be made available. Supplementary tests for the model should be produced at the WTM.
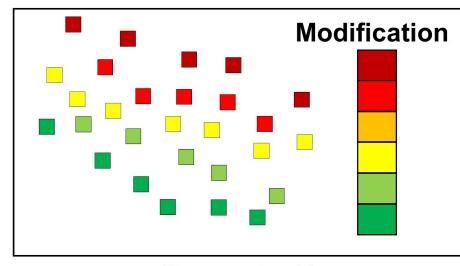
Location: Erlangen

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Responsible professor: Prof. Körner

The supervisor can also provide information on other topic opportunities in the areas of conductivity in aluminium die casting and alloy development if interested.

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