

Ausschreibung einer Masterarbeit zum Thema:

Austenite/Ferrite-phase transformation in low-alloyed steels – Modelling and TTT-diagrams

Microstructural changes connected with phase transformations occur during processing of steels and determine the properties of the final product. Three different mechanisms occur during solid/solid phase transformations, nucleation, growth of the product phase at the expense of the parent phase and impingement of the migrating interfaces [1]. The mechanisms and the relevant dissipative processes during growth (rearrangement of the phases, diffusion of components) are considered in a model [2] and the results are used to predict TTT-diagrams, see e.g. [3]. It is expected to obtain further insight into the austenite-to-ferrite or austenite-to-bainite transformation by a combination of measurements (experimentally obtained TTT diagrams) and thermodynamically based modelling. The successful applicant should have an interest in thermodynamic problems and basic knowledge of coding.

The work will focus on fundamental aspects of microstructural changes in low-alloyed steels relevant also for industry and will be supported by our industrial partner

“voestalpine Forschungsservicegesellschaft Donawitz GmbH”

(Ansprechpartner: Dr. Johannes Kreyca).

References

[1] E.J. Mittemeijer, F. Sommer: “Solid state phase transformation kinetics: a modular transformation model” Z. Metallkd. 93 (2002) 352-361

[2] E. Gamsjäger, J. Svoboda, F.D. Fischer: “Austenite-to-ferrite phase in low-alloyed steels”, Comput. Mater. Sci. 32 (2005) 360-369.

[3] Dissertation: E. Gamsjäger: Diffusional phase transformation in low alloy steels – Theory and application to continuous casting, Fortschritt-Berichte VDI, Reihe5 (Grund- und Werkstoffe / Kunststoffe), Nr. 672 (2003).