

Advertisement for a Dissertation, 19th of July 2017

Development of a ferritic creep resistant steel with superior creep strength and creep fatigue resistance

Description and aim of this work

The main goal of the project is to develop a concept for an oxidation resistant ferritic 13 – 16% Cr steel with sufficient mechanical properties for steam and gas turbine applications to achieve at least a service lifetime of 105h at a temperature of 650°C and a stress level of 100MPa. Major challenge of the project is to define a proper chemical composition by means of modelling and simulation for advanced creep and creep-fatigue properties. Here, the improvement of the used material data bases is of utmost importance.

In this project, the phenomena related to upscale from lab scale to industrial scale have to be researched. Due to the larger material dimensions in industrial manufacturing of materials, large temperature gradients during processing, segregations, etc., have to be taken into account.

WP1: Project management and dissemination

WP2: Development of an alloying concept and a suitable heat treatment procedure

WP3: Thermo-mechanical testing

WP4: Simulation of microstructural changes during annealing and creep



Abb. 1: Cast bonnet of creep resistant steel

Organizational

Supervisor: Univ.-Prof. Dipl.-Ing. Dr.techn. Christof Sommitsch: christof.sommitsch@tugraz.at

Duration: start fall/winter 2017, 3-years project (fully employment for 3 years)

Location: IMAT – Institute of Materials Science, Joining and Forming. Working group: Materials
Kopernikusgasse 24/1, 8010 Graz

Further information

For further information please contact the secretary of the institute or the supervisor.

Tel: +43 316 873 7181, office.imat@tugraz.at / www.imat.tugraz.at

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¹ (Abb. 1): "Cast bonnet of creep resistant steel" (E. Plesiutchnig et al.: Advanced microstructures for increased creep rupture strength of MARBN steels, Proc. Thermec 2013).