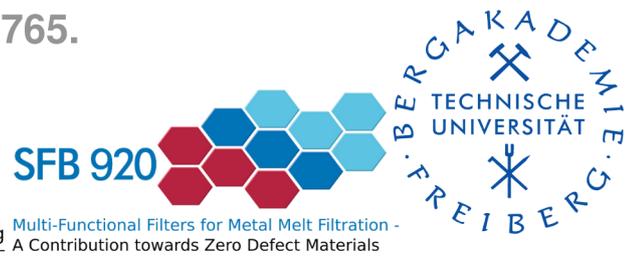


The University of Resources. Since 1765.

Faculty of Mechanical, Process and Energy Engineering  
 Institute of Thermal Engineering  
 Chair of Engineering Thermodynamics



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Multi-Functional Filters for Metal Melt Filtration -  
 A Contribution towards Zero Defect Materials

## International Scholarship for PhD-Students in terms of the Integrated Research Training Group of the Collaborative Research Center 920 (CRC 920)

### “Multi-Functional Filters for Metal Melt Filtration - A Contribution towards Zero Defect Materials”

There exists an increasing pressure on the metal-making and metal using industry to remove solid and liquid inclusions such as deoxidation products, sulfides, nitrides carbides etc. and thereby improve metal cleanliness. It is well known that size, type and distribution of non-metallic inclusions in metal experts considerable effects on the mechanical properties of the cast products. The aim of the collaborative research center is an enormous reduction of non metallic inclusions in the metal matrix by utilizing intelligent filter materials as well as filter systems with a functionalized filter surface. More than 60 scientists from 12 different disciplines in the areas of ceramics, processing, filtration simulation, metal casting, metal testing, flow dynamics, modeling of ceramic behavior at elevated temperatures and thermodynamics work for the next four years.

It is essential to know thermophysical properties of the open celled ceramic foams and to determine heat transfer coefficient during the filtration process to achieve the objectives in one of the areas mentioned above. Particularly the transient filtration process is of vital importance for the thermomechanical behavior of the filters. Associated with its extremely large temperature rise, large amounts of heat are transferred within seconds. In addition to measurements in the casting process, numerical evaluation of the obtained temperature curves is necessary. The conservation equations describing the system have to be solved for the determination of the volumetric heat transfer coefficients. The international PhD-candidate will be integrated in subproject B03 of the CRC at the chair of Engineering Thermodynamics and contribute to the numerical part of this project.

#### Requirements

Candidates should have a master degree (or equivalent) in engineering thermodynamics, thermo fluid dynamics, mathematics or equivalent. Very good skills in English written and spoken, and the ability to work and communicate within a team of scientists from various disciplines is expected. We are looking for candidates who are highly motivated to conduct high quality research, publish in top venues and scientific journals.

#### Scholarship

The scholarship is based on the DFG funding program for the CRC (value of EUR 1340,- + material expense of EUR 103,- + family expenses). Fixed-term contracts are for 12 months and may be extended by mutual agreement up to 36 month for a PhD. Successful applicants will join the research team B03 of the CRC 920 as well as will have to participate in the integrated research training group. The aim of the integrated research training group is the qualification of doctoral researchers within the framework of a focused research program and a structured training strategy for an excellent scientific work. Individual support of the doctoral researchers as well as integration with creative work in the topics of the Collaborative Research Center are approaches for a successful career in academia or industry.

#### Application

Applications must be submitted on the corresponding form by e-mail to the executive secretary of the CRC 920: Dr.-Ing. Undine Fischer ([undine.fischer@ikgb.tu-freiberg.de](mailto:undine.fischer@ikgb.tu-freiberg.de)).

For more detailed information please contact Prof. Dr.-Ing. habil. Ulrich Gross ([ulrich.gross@iwtt.tu-freiberg.de](mailto:ulrich.gross@iwtt.tu-freiberg.de)) by e-mail. We invite applications from highly qualified candidates of any nationality (no German). Women are especially encouraged to apply. Preference will be given to disabled applicants in case of equivalent qualifications. Application deadline is **31.03.2012**.