

HoTMiX project is a joint French-German academic research project funded for 3 years by the ANR and DFG agencies. It brings together 6 academic labs and is supported by the St Gobain and Safran companies. The aim of the project is to provide a deep understanding of the relationships between the nonlinear mechanical response of oxide materials at very high temperature and their microstructure at the nanoscale. The relationship between microstructure and mechanical properties will be explored by combining two different approaches. In situ measurements at very high temperature or under applied stresses will be carried out using X-ray based advanced techniques at synchrotron radiation beamlines and accurate microstructural modelling based on virtual microstructures submitted to temperature and external stresses evolutions will be developed. More details on the HoTMiX project can be found here: www.bam.de/hotmix

Recruitment of a PhD student (m/f)

"Thermomechanical properties of refractory materials, influence of the diffuse microcracking"

1. Your responsibilities include:

- ✓ Selection of materials (High Zirconia fused-cast refractories, Aluminium Titanate based refractory material) in close collaboration with St-Gobain and Safran;
- ✓ Development of specific techniques for the mechanical characterization of refractory materials at high temperature, in particular involving Digital Image Correlation (DIC);
- ✓ Characterization of high temperature mechanical properties (elasticity, thermal expansion, stress/strain laws, damage monitoring, thermal shock behaviour) of these different materials, with a particular attention on non-linear behaviour during tensile and compressive loadings;
- ✓ Interpretation of the obtained results in relation with microstructure evolution versus temperature to be investigated by classical laboratory means but also by more specific devices at synchrotron radiation sources in collaboration with other partners of HoTMiX;
- ✓ Managing micro-mechanic simulations using Discrete Element Method (DEM).

2. Your qualifications:

Master level in materials science with a background in solid mechanics or master level in mechanics with a specialization in materials. A great affinity with instrumentation, experimental investigations and microstructure characterization in order to interpret the obtained results. Excellent communication skills (both written and oral) in English.

3. We offer:

PhD student will be employed by the CNRS in Limoges. Most of the experimental work will be done at the IRCER lab., but some parts will also be managed in collaboration with other network partners (BAM lab. in Berlin, PIMM lab. in Paris). This full-time position will be available from October 2020 and is offered on a fixed-term 36 months contract. The gross monthly salary will be equal to 2135 €.

4. Your application:

Applications, consisting of a CV, scores of master 1 and 2 or equivalent diploma, a letter of motivation and a letter of recommendation, should be sent to the following addresses: marc.huger@unilim.fr, damien.andre@unilim.fr and nicolas.tessier-doyen@unilim.fr before June 2nd. Please attach detailed application documents to the email as a summarized unique file in PDF format.

5. More information:

- ✓ About HoTMiX project: www.bam.de/hotmix
- ✓ About Host Institution: www.ircer.fr
- ✓ About Supervisors: www.unilim.fr/marc.huger, www.unilim.fr/damien.andre

