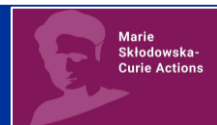




Open PhD Position in European Industrial Doctoral Network (DN-ID)



www.cesaref.eu

Concerted European action on Sustainable Applications of REfractories (CESAREF)

What is CESAREF and what is the focus of this network?

CESAREF will train researchers in multi-engineering areas and expose them to the academic and non-academic sectors through international and inter-sectoral mobility combined with an innovation-oriented mindset. They will get the right combination of research-related and transferable competences in the **full production-to-the-end-of-life cycle of refractory materials applied to Iron & Steelmaking processes** with regards to the new operation conditions required by the drastic reduction of greenhouse gas emissions, improved energy efficiency, and by life cycle assessment requirements. An important part of the project will be dedicated to the sustainability of refractories, including recycling issues, using the **Life Cycle Assessment** methodology. **15 doctoral candidates** will take advantage of the most sophisticated numerical tools and laboratory equipment to model, design and predict the life of refractory materials in critical operational conditions. Being trained in scientific, technical, and soft skills, these PhDs are the next generation of highly employable scientists and engineers in the refractory sector and related areas. New testing methods and models will be developed to address the Scientific/Technological challenges for these applications and help to design better performing and sustainable refractory materials and linings. The research training is implemented through strong relationships between 10 academia and 16 industrial partners across the EU. The CESAREF network (www.cesaref.eu) is structured to take full advantage of intensive cooperation between **academia, raw material suppliers, refractory suppliers and high-tech metal component producers** with a direct link to the **FIRE** federation (fire-refractory.org).

Specific subject of PhD2 (one of 15 PhD's of the CESAREF DN-ID project)

PhD2 Topic: Comparison between production routes

Objectives: The aim of this PhD thesis is to build LCA models relevant for the industrial reality, including several manufacturing routes for refractories, and new developments in terms of recycling. The ultimate goal is to reduce the environmental footprint of refractory production for the steel industry throughout their entire life, thereby contributing to the decarbonation of steel production. The stay at the industrial partner will allow to obtain inventory data on real production chains, including recycling ones, for several products types (bricks and big blocks, castable and mortar, preshaped products). Based on the results, eco-design strategies will be proposed.

Expected Results: LCA profiles of several types of refractory materials, eco-design strategies allowing to reduce the environmental impact by optimizing production route, choice of raw materials and incorporation of secondary materials coming from recycling.

Keywords: Raw Materials, resource depletion, eco-design, reduction of environmental footprint, recycling, LCA

Applicant Profile: Master's level in Geology, Mining, Ceramic Material & Processes, Materials Engineering, Chemical Engineering, Environmental Engineering. Candidates should possess a solid scientific and engineering background and a good understanding of the raw materials supply chain, with a strong affinity for technology. They should have excellent oral and written communication skills in English. Knowledge of LCA methodology and a previous use of an LCA software will be highly appreciated.

PhD main locations:

Period 1 - St-GOBAIN (www.ceramicsrefractories.saint-gobain.com), Cavaillon, France (18 months)

Period 2 - Université de Liège (www.chemeng.uliege.be), Liege, Belgium (18 months)

Due to the Mobility Rule by the funding agency, residents of France cannot apply for this PhD2 position

Apply until June 27th following indications at www.cesaref.eu/recruitment-procedure

If you have any questions, feel free to contact the supervisors:

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