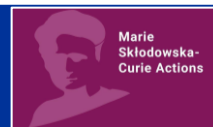




Open PhD Position in European Industrial Doctoral Network (DN-ID)



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 PhD1 (one of 15 PhD's of the CESAREF DN-ID project)

PhD1 Topic: Documenting the upstream of refractories manufacturing to support LCA

Objectives: The main objective of this PhD thesis is to contribute to significantly improve Life Cycle Assessment (LCA) of refractory products by compiling a unique anonymized database of worldwide refractory raw materials. The project will also consider the use of indicators to promote sustainable production processes from cradle to gate. It will definitely contribute to a better definition of resource depletion by taking into account the transfer of materials from the geosphere to the anthroposphere and the fate of refractory materials at end-of-life (dissipation, recycling, abandon, etc.).

Expected Results: - A complete database of refractory raw materials with full documentation of the extraction / preprocessing routes. Compatible with database standards used in LCA. - Development of sustainability certification of refractories based on traceability of the raw materials sourcing. - Abiotic Resource Depletion (ADP) concept adapted to the specific case of industrial minerals.

Keywords: Raw Materials, resource depletion, recycling, LCA

Applicant Profile: *Master's level in Geology, Mining, Materials Engineering.* Candidates should demonstrate a strong engineering background and have a good understanding of the raw materials supply sector. They should have excellent oral and written communication skills in English. Prior knowledge of life cycle assessment principles will be appreciated.

PhD main locations:

Period 1 - RHI Magnesita (www.rhimagnesita.com), Leoben, Austria (18 months)

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

Due to the Mobility Rule by the funding agency, residents of Austria cannot apply for this PhD1 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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