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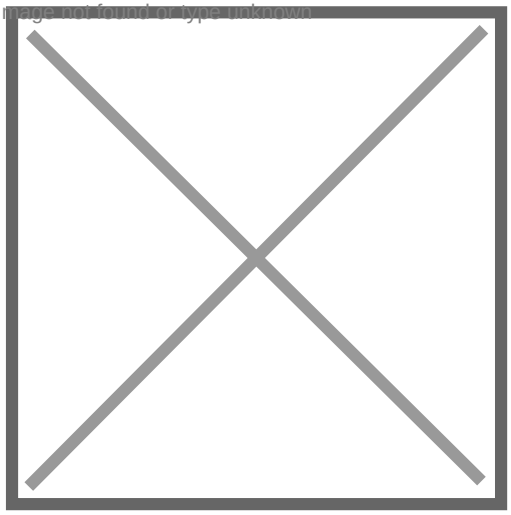

LC SPIRE 08 2020

FORGE

Full Title: Development of novel and cost-effective coatings for high-energy processing applications

Aim:

The equipment currently used in energy-intensive industries is vulnerable to corrosion and erosion as well as brittle fractures/cracking from the gas collection and kiln operations. Improvement of this equipment, and future equipment planned to be installed in these industries for the implementation of CO2-emission reduction technologies, is essential to increase production efficiency, component lifetime and reduce environmental impact. With this in mind, the EU-funded FORGE project aims to provide the energy intensive industries with coatings solutions based on Compositionally Complex Materials and multiple Spraying Techniques.

Concept:
FORGE will explore a new materials space, starting from High Entropy Alloys and Ceramics. This will be done combining machine learning models, thermodynamic calculations, and high-throughput experiments. The project will implement high-performance coatings with new compositionally complex alloys and ceramics on specific vulnerable process steps, such as CO2 capture, waste heat recovery pipework, components undergoing high wear and in kiln, to combat the degradation forces found at each, also assuring their effectiveness with the use of smart online monitoring of coating degradation. It is expected that, as an outcome of the FORGE, a minimisation of the overall capital and operative expenses will be achieved especially in the sectors addressed in the project: Steelmaking, Aluminium, Tiles and Cement industries.

Start date:
01/11/2020

End date:
30/04/2024