



SUBLime

Sustainable Building Lime
Applications via Circular Economy
and Biomimetic Approaches



OPEN PhD POSITION in European Training Network

We are looking for a dedicated and highly motivated Early Stage Researcher (ESR), who will join our team to craft the future of lime mortars/plasters in new construction and conservation of the built heritage.

SUBLime description (4 years ETN project starting February 2021)

Lime is one of the earliest industrial commodities known to man and it continues to be one of the essential building blocks of modern Society. The global lime market is anticipated to approach the value of 44 Billion Euros by the end of 2026 and resulting in various growth opportunities for key players. The SUBLime network aims to develop the most advanced technology in lime-based materials modelling and characterization for industrial use that will go beyond the limitations of existing solutions in new construction and conservation in the built heritage. It is dedicated to recruit and train fifteen PhD students in multiple scientific and engineering fields towards a better understanding and development of sustainable innovations in both added functionalities and sustainability aspects in lime mortars and plasters, strongly based on novel biomimetic and closed loop recycling approaches. The cross-disciplinary approach throughout the SUBLime value chain, leveraging the knowledge of the academic (6) and industrial members (11), such as lime producers, mortar/plaster/block producers, and end-users for the prioritization of industrial needs, will dramatically increase the transfer of scientific knowledge to the lime-consuming industries in the EU.

ESR14 – SUT

Behaviour of masonry made of lime-based mortars based on large scale testing & simulation – subsoil settlements & earthquake

Objectives: To study the behaviour of masonry made of different types of units (clay and/or Ca-Si solid bricks and the most wide being in use hollow blocks) and lime-based and/or modified mortars subjected to in-plane horizontal and vertical shearing forces produced by seismic actions and cyclic loads or irregular vertical displacements (e.g. irregular settlements) with and without some delay influences (creep and shrinkage). Based on the tests of larger specimens (with and without plastering) the load-bearing capacity as well as in-plane deformations and crack resistance will be analysed. This project will be carried out in three ways: (a) determination the bond strength of lime-based mortars to masonry units and its self-healing or crack resistance enhancement; (b) prediction of behaviour of masonry larger scale elements under horizontal cyclic loads or statically vertical shearing based on numerical simulations, validated by large scale test data; (c) analytical or semi-analytical calculation methods based on modification of the material properties.

Expected Results: Determination of the real bond strength of mortars to masonry units and its self-healing or crack resistance enhancement and prediction of behaviour of masonry larger scale elements. The analytical or semi-analytical methodology based on modification of the material properties for masonry large structures taken masonry as homogenized material will be elaborated.

Keywords: in-plane behaviour, cyclic loads, lime, mortar, masonry, modified mortars, homogenisation.

Applicant Profile: Master level in Civil Engineering or related field, ideally with background in experimental research. Excellent communication skills (both written and oral) in English.

PhD main locations: The recruited ESR is given the opportunity to conduct 3 years of PhD studies at [Department of Structural Engineering](#) at the [Silesian University of Technology](#) but also to visit other network partners for secondments ([UGR](#), [Wienerberger](#)), and to attend the training events of the network.

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More details about SUBLime project, requirements for the candidates and recruitment procedure: www.sublime-etn.eu/jobs/