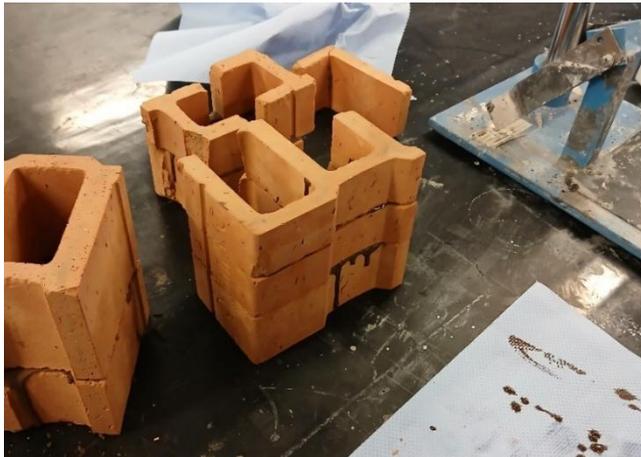


Sustainable Thin-Bed Mortars for Clay Brick Applications

GECCO₂ Christian Doppler Laboratory – TU Graz

Institute of Applied Geosciences & Institute of Technology and Testing of Building Materials



Thin-bed mortars enable material-efficient clay brick masonry with optimized thermal performance and reduced resource consumption. In the context of CO₂ reduction and circular economy strategies, the development of sustainable, resource-efficient binder systems is a key challenge for the construction industry.

Within the Christian Doppler Laboratory GECCO₂ at TU Graz, this master thesis focuses on the development of innovative thin-bed mortar binders incorporating mineral waste streams and secondary raw materials. The project bridges applied mineralogy, materials science, and concrete technology by linking reaction mechanisms with engineering performance.

The main objectives are:

- Development of sustainable binder formulations for thin-layer applications
- Tailoring of setting behavior, early strength development, rheology, and bond performance
- Correlation of phase assemblage, microstructure, and reaction kinetics with macroscopic properties

The methodological approach combines XRD, FTIR, and isothermal calorimetry with mechanical, rheological, and bond testing. The work ranges from small-scale binder optimization to laboratory-scale mortar trials, aiming to establish structure–property–performance relationships.

We are looking for motivated Master students who enjoy hands-on experimental work, think independently and creatively, and are interested in combining mineralogical fundamentals with applied material development. The thesis offers an interdisciplinary research environment, advanced analytical infrastructure, strong industry interaction, and the opportunity to contribute to materials with real practical impact.

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