

Experimental testing of the effects of fiber distribution on FRC structural components [Civil Engineering, Concrete Technology]

Motivation

Fiber reinforced concrete (FRC) is an innovative high-performance concrete mixture where the distribution of fibers has a key role in the final mechanical characteristics, especially on the ductility and the tensile strength. The understanding of the effect of fibers in the structural elements is crucial for the durability of key infrastructures.

Short Description

In this thesis, the student will address the testing of structural components made with FRC to assess the effect of fiber distribution, comparing the experimental results with the existent numerical prediction. In addition, the thesis will have the objective of proposing alternative testing setup, to unlock the performance improvement of concrete mechanical properties. After an initial literature review, classical and innovative test setups will be discussed and designed. Then, in collaboration with the EuroTube team members, will build the test setup and run the experiments. A key aspect of the proposed setup will be the preparation and validation of the measurement systems. Finally, the gathered data will be analyzed and discussed, taking a critical look at previous experiments and potential improvements in the construction processes.



Type	Master thesis
Partner	EuroTube Foundation
Supervisor	Lorenzo Benedetti

Possible work packages

- Literature review (previous studies, experiments and norms)
- Mechanical properties baseline
- Testing of concrete specimens
- Definition of testing setups
- Expected results (numerical or hand-calculations)
- Preparation of the testing setups
- Validation of the measurement system
- Extraction of results and finalization of thesis

Requirements

- High motivation and interest in the topic
- Able to work independently and be creative
- Methodological and goal-oriented approach
- Willing to test concrete in laboratory
- Knowledge in advanced structural design
- Knowledge in data measurement in testing setups

Application

Please email your CV, transcript and motivation letter to lorenzo.benedetti@eurotube.org