



Master Thesis and Traineeship Proposal

Supervisor Prof. Gianfranco Dell’Agli email: gianfranco.dellagli@unicas.it
Dr. Luca Spiridigliozzi.....email: l.spiridigliozzi@unicas.it

Subject Materials science and engineering

Title Alkali-Activated Materials for greenbuilding applications

Tipology Experimental

Abstract The aim of the thesis is to prepare, through Alkali-Activation of selected aluminosilicates, geopolymeric products with adequate mechanical/thermal properties to be used as urban pavings and/or thermal insulation panels. Among the many different solutions that have been proposed to lower the carbon footprint in the construction industry, geopolymer-based building materials began to emerge from research scale to industrial applications. Generally speaking, a geopolymeric product is produced by the polymerization of aluminosilicate materials by an alkali (high pH values) solution. However, geopolymers present several problems towards large-scale applications mainly due to problems related to primary source materials and scarce process standardization. Therefore, the optimization of the composition of solid/liquid precursors and of the technological production cycle represents a very interesting possibility to tackle such problems. The expected results of the traineeship are the preparation of Alkali-Activated Materials with optimized compositions that are prone to be scaled at industrial level as outdoor/indoor pavings and thermal insulation panels.

Expected starting date and duration Thesis work is expected to start in February 2020, with a duration of at least 6 months.

Traineeship Traineeship will be conducted in the Materials Laboratory (LAB-MAT), in collaboration with an innovative Startup (RECO2) dealing with the industrialization of such kind of products. The traineeship has a duration of at least 5 months. During the traineeship activity, students will carry out the synthesis of variously-composed Alkali-Activated Materials, analyse their structural and microstructural properties, and test their mechanical/thermal properties.

At the end of the Traineeship, there could be the possibility to continue collaborating with the Startup RECO2 (www.reco2.it)
