



## WORK OFFER

Ref. No. BE-2021-040VUB

### Employer Information

**Employer:** VUB - IR - MACH - FYSC  
FYSC  
Pleinlaan 2  
  
1050 Brussel  
Belgium

**Website:** <http://www.vub.ac.be/MACH/FYSC/>

**Location of placement:** Vrije Universiteit Brussel  
**Nearest airport:** Brussels Airport Zaventem  
**Working hours per week:** 37.0  
**Working hours per day:** 7.6

**Number of employees:** 29

**Business or products:** Research and Development

### Student Required

**General Discipline:** CHEMISTRY AND CHEMICAL ENGINEERING;  
MATERIAL SCIENCES AND ENGINEERING

**Completed years of study:** 4

**Field of Study:** .Materials Engineering.;Inorganic Chemistry.;  
.Materials Engineering.

**Student status requirements:** Student status during the entire internship is mandatory; please include a Certificate of Enrolment with nomination.

**Language required:** English Excellent (C1, C2) Or  
French Excellent (C1, C2)

#### Required Knowledge and Experiences:

In addition to the theoretical knowledge obtained throughout the first 4 years of the study, practical laboratory skills are a plus. Furthermore, the following skills are required:  
- Reporting tools: Word, PPT or equivalent  
- Calculating tools: Excel, Matlab or equivalent

#### Other requirements:

As a minimum the application should contain a CV, motivation letter, past diplomas and score sheets.  
The applicant will be interviewed via Skype to evaluate the student and to match interests.

### Work Offered

The project will be carried out in the framework of STIF project (STIF: Stiff Impact and Fire resistant thin composites (ICON) in SIM-MARES Program), which aims to develop textile reinforced cementitious materials presenting some thermal stability. The cementitious matrix will be of inorganic polymer (geopolymer) type, mainly using copper slag as solid silicate precursor and potassium silicate as the activating solution. Parameters to be investigated in the cementitious matrices will include the effect of particle size of copper slag, the effect of surfactants and other minerals (bauxite, alumina powder, chamotte) admixtures on the shrinkage, thermal and mechanical properties. The effect of the composition of the activating solution will also be studied on the storage capacity of the matrices. The experimental work related to the characterisation of the matrices will mainly include isothermal calorimetry, differential scanning calorimetry, setting time using VICAT test and resonalyser for non-destructive mechanical tests. Fourier Transform Infrared spectroscopy (FTIR), thermogravimetric analysis (TGA), X-ray diffraction (XRD) and scanning electron microscopy (SEM) could also be used.

The student will be trained on how to prepare Textile Reinforced Composites (TRC). He will then prepare a series of TRC using various type of textiles including carbon, basalt and aramid. A proposal of an industrial approach for making the laminate will be appreciated. Parameters to be investigated on the TRC will include the fibre /matrix interactions, the effect of small addition of chopped fibres on the shrinkage and mechanical properties as well as the effect of elevated temperature (300- 1200 C). Mechanical properties will include stiffness, three point bending test, impact strength and pull-out test.

We are looking for people interested in cementitious materials research and innovation that work well in a team, yet able to focus independently on their respective tasks. Knowledge and/or experience in geopolymer, textile reinforced concretes and the techniques described above are a plus.

**Number of weeks offered:** 12 - 24

**Within the months:** 01-MAR-2021 - 27-AUG-2021

**Or within:** -

**Company closed within:** -

**Latest possible start date:** 07-JUN-2021

**Working environment:** Research and development

**Gross pay:** 200 EUR / Week

**Deduction to be expected:** 0

**Payment method / time of first payment:** Bank Transfer / Every 2 weeks

### Accommodation

**Canteen at work:** Yes

**Expected type of accommodation:** Student dormitory

**Estimated cost of lodging:** 100 EUR / Week

**Accommodation will be arranged by:** IAESTE LC Brussels

**Estimated cost of living incl. lodging:** 200 EUR / Week

### Additional Information

### Nomination Information

**Deadline for nomination:** 15-MAR-2021

**Date:** 12-JAN-2021

**On behalf of receiving country:**

Annelies Vermeir