

## Mortars and concrete with recycled aggregates (CDW) subjected to CO<sub>2</sub> fixation

### Summary

This thesis aims to use carbonate recycled aggregates as opposed to natural aggregates in the formulation of cementitious products. In this way, it is intended to improve the characteristics of products such as mortars and concretes with the incorporation of carbonated recycled aggregates (CDW), or with CO<sub>2</sub> fixation by other mechanisms, for their different fields of use. Thus, the development of the PhD thesis will contribute to the capture and/or reduction of part of the carbon dioxide emissions of the Portuguese cement industry, providing it with mechanisms to make it more sustainable in energy and environmental terms. It also intends to contribute to the reduction of the extraction of non-renewable natural resources, in the form of natural aggregates, by the construction sector.

The thesis is within the WP10B project – forced and accelerated CO<sub>2</sub> sequestration by CDW to incorporate as aggregates in mortars and concrete – of c5Lab, and is funded by c5lab collaborative laboratory (CoLab 4/2018-CemLab).

The thesis has three experimental and research phases: 1) evaluation of the recycled aggregates from recycling and treatment plants of construction and demolition waste; the waste is analysed before and after carbonation regarding its physical characterisation; 2) production of mortars with a volumetric ratio of 1:4 with recycled aggregates before and after undergoing forced and accelerated carbonation percentages of replacement of the natural aggregate at 50% and 100%, in volumetric terms, and concrete ; 3) evaluation of the physical and mechanical performance of the mortars and concrete carried out on prismatic specimens and as renders (for mortars) applied on a support, namely on ceramic brick.

### Keywords

Construction and demolition waste, CO<sub>2</sub> sequestration, recycled aggregates, carbonated recycled aggregates, carbon capture and storage.



Mixed recycled aggregates.



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