

Title: Mechanical and decontaminating behaviour of recycled mortars with TiO_2

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The circular economy is an economic model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products. The use of recycled materials in products with low mechanical requirements, especially those from construction and demolition waste (CDW), is a common practise in construction sector. In addition, the incorporation of photocatalysts (mainly nano-TiO_2) in construction materials has emerged as a promising technology to develop products with special properties as air decontamination, self-cleaning and self-sterilizing ability under UV-Vis light irradiation. This research aims to study the decontamination power of recycled mortar with recycled fine aggregate from CDW. For this, two different series of mortars were produced. One series contained traditional Portland cement and the other one photocatalytic cement, which included TiO_2. Both cements had the same requirements. Each series contained 4 mixtures with 4 different rates of replacing natural sand with mixed recycled sand (0%, 20%, 40% and 100%). 40x40x160 mm specimens were manufactured and were evaluated through mechanical strength (compressive and flexural strength), after 28 days. A sample of each mortar was sent to an external laboratory and analysed its photocatalytic power, following a standardised methodology. The results showed good mechanical behaviour despite the incorporation of recycled aggregate and a similar behaviour between mortars with photocatalytic cement.

Biography

Auxi Barbudo has extensive research experience, shown through 23 journal publications (index h = 12 and i10 = 14). She participated last year at the 2nd World Congress and Expo on Recycling, held in Edinburgh, Scotland, and in a total of 18 congresses. She has proven professional experience as a researcher in 5 research projects, 2 research contracts, a stay in a European research centre, as reviewer in the process of publishing scientific articles, and as evaluator of international research projects. Her actual research topic is the application of recycled materials in the construction sector with decontaminating power.

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