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UNCONVENTIONAL MORTARS WITH RECYCLED CATHODE RAY TUBES WASTE GLASS

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Abstract

In the European Union, the hazardous waste recycling has become a priority, as response at legal prohibition for landfilling of untreated WEEE. The economic and eco-efficient recycling methods acquire more and more interest from the industry. The Cathode Ray Tubes (CRT) glass derived from Waste of Electric and Electronic Equipment (WEEE) dismantle is known as hazardous waste, because of their heavy metals content, especially lead. For this type of waste, the authors have proposed in previous studies a green recycling method by embedding it in cement matrix.

The purpose of this study is to obtain unconventional mortars with different ratio of CRT waste glass as substituent of natural aggregates, and to compare their mechanical strength with another original CRT composite one. The goal was to demonstrate the viability of the new CRT materials, obtained under the mortars EU Standard provisions, in order to enlarge the possibilities to recycle this type of waste. Mechanical tests and SEM analyses have been performed. The results showed that mechanical strength decreased with the increasing of CRT waste amounts; whereas the new original composite's mechanical properties are higher than the standard mortar. Nevertheless, the CRT “mortar” mechanical properties allow a comparison with plastering mortar even 100% of natural aggregates were substituted. This type of mortars represents an environmentally friendly option for WEEE recycling.

Key words: composite, CRT, mortar, waste, WEEE

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