

Potential of recycled powder from clay brick, sanitary ware, and concrete waste as a cement substitute for concrete: An overview

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ABSTRACT

As demand for cement-based products increases worldwide, more and more of our planet's finite natural resources are being consumed, creating more and more construction waste. Concerned about the depletion of reserves, the loss of green forests, and the accumulation of waste that poses a threat to the environment, researchers have looked at the possibilities of using renewable resources as cement substitutes. One possible solution to the environmental pollution engendered by construction and demolition waste (CDW) from clay brick, sanitary ware, and concrete is to use them as binders in concrete. This review focuses on one specific use of cementitious materials: the powder made from clay brick, sanitary ware, and concrete waste. Based on the findings of several studies, the physical and chemical features of recycled powder from clay brick, sanitary ware, and concrete debris are discussed. The results of previous tests showed that the use of an appropriate amount of finely ground clay bricks and sanitary ceramics with high silica content enhances the strength and durability of concrete. Regarding the use of recycled powder from concrete, the results showed unsatisfactory mechanical and durability properties. However, with suitable treatment methods, comparable or even higher mechanical properties can be achieved. To maintain a lush green environment and create a clean environment for the formation of sustainable cities and towns, the majority of researchers support the idea of using waste with high silica content as an alternative binder for the production of concrete products.

KEYWORDS

Clay brick powder; Ceramic sanitary powder; Recycled concrete powder; Sustainable concrete mechanical properties; Durability

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