

A review of the role of glass waste on the fresh and mechanical properties of concrete as an environmentally friendly materials

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ABSTRACT

One of the biggest problems facing the world is the management of waste glass. This waste glass can come from glass containers or packaging, flat glass, household or tableware glass, or continuous filament glass. The problem is becoming increasingly difficult as more and more waste glass is generated and landfill space is becoming constrained. One potential method to solving this issue is to convert glass waste into construction substances. The use of recycled waste glass in the production of cementitious concretes as environmentally friendly building materials has recently attracted considerable interest in the construction sector. Therefore, studies aim to recycle glass waste into concrete, which is a great opportunity to produce cement mortar and concrete. Even though a significant amount of glass waste is generated worldwide every year, only a small portion of it is reused by mixing it into concrete, which is an efficient way to address the problem. This study provides a critical review of the work done on the reuse of glass waste as a substitute for cement and aggregates in terms of the mechanical and fresh properties of mortar and concrete production. In addition, this research intends to provide a clearer knowledge of the incorporation of reused glass waste glass as an environmentally friendly resource in the concrete industry. It also aims to establish future research objectives and promote the utilization of concrete made from recyclable materials in the development of environmentally friendly and durable concrete. This study shows that incorporating glass waste into concrete improves its properties. It was also found that the properties of concrete compared to conventional concrete and mortar mainly depend on various factors such as shape, type, size and replacement ratio.

KEYWORDS

Concrete; Environmental benefit; Fresh properties; Glass waste; Mechanical properties; Recycling; Replacement materials

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