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GLASS WASTE as an ALTERNATIVE RAW MATERIAL for CONCRETE MIXTURES – A REVIEW

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ABSTRACT

In modern construction, environmental issues have been taken into account as a major concern. Only reusing and recycling waste are considered viable options for reducing waste production. Concrete is a strong compressive composite that is commonly employed in the building sector today. The concrete consists of cement, fine aggregates and coarse aggregates. In addition, the cement manufacturing industry emits 7% of greenhouse gases into the environment, contributing to global warming. To address these environmental effects, substantial research is being conducted into the usage of cement substitutes and aggregates, which include a variety of waste materials [such as waste glass, plastics, and fly ash] as well as industry by-products. On other hand, millions of tonnes of glass garbage are generated each year, posing serious environmental issues around the world due to the non-biodegradable form of the waste glass**.** Silica makes up the majority of the glass. Due to increased disposal costs and environmental concerns, the use of recycled waste glasses in concrete has generated a lot of attention around the world. Many researchers investigated different options for valuing glass waste by substituting aggregates and cement in concrete mixes. In the main context of researches in this sector, its impacts on mechanical properties were investigated. Main drawbacks of using crushed glasses as aggregates in concrete are the expansion and cracking that occurs as a result of the glass aggregates due to ASR (Alkali-Silica-Reaction). The use of glass in concrete still has to be improved. Laboratory tests were carried out to further investigate the usage of waste glass as coarse and fine aggregates in concrete for both ASR mitigation and decorative purposes. This scientific paper reviews researches on the topic of reusing glass waste in the construction field as a partial replacement for cement and aggregates in the concrete. The impact of particle size and content, as well as the proportion of waste replacement and mitigation of ASR, on concrete's fresh and hardened qualities, is also explored.

Keywords: *Alkali-Slica reaction, Concrete, Glass waste, Mechanical properties*