

The present state of the use of palm oil fuel ash (POFA) in concrete

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ABSTRACT

Concrete industry consumes considerably large quantities of natural resources in addition to generating toxic gases, such as CO₂, in the atmosphere. In order to achieve more sustainability in the concrete sector, research should focus on using alternative renewable resources such as palm oil waste for concrete production purpose. Palm oil fuel ash (POFA) is a by-product obtained during the burning of waste materials such as palm kernel shell, palm oil fiber, and palm oil husk; it can be utilized to partially replace cement in a concrete mix. This paper presents a review of the applications and effects of POFA on concrete properties as reported by previous studies that have been conducted to find out POFA properties and its effects under various conditions. Chemical and physical properties of the resulting concrete have been illustrated depending on the POFA characteristics in several sources. Many studies have shown that concrete containing POFA has better compressive strength, durability and other properties than concrete containing Ordinary Portland Cement (OPC) only. Other researchers have shown more advantages of POFA replacement in concrete in specific proportions, especially minimizing CO₂ gas emissions and thus improving environmental conditions.

KEYWORDS:

Palm oil fuel ash; Chemical and physical properties of concrete; Compressive strength and durability; CO₂ emissions; Environment friendly materials