

Mechanical properties of steel/kenaf (hybrid) fibers added into concrete mixtures

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ABSTRACT

This paper investigates the potential advantages of adding hybrid steel-kenaf fibers to concrete mixtures. Compression and flexural test were conducted on six concrete mixtures at 28 days to investigate the mechanical properties of the concrete. The experimental work consists of six concrete mixtures, in which the first mixture was a control mixture without adding any fiber. The following five concrete mixtures contain a total of 1% of volume fraction for steel, kenaf and a mixture of steel-kenaf (hybrid) fibers. Three ratios were considered for hybrid fibers with the ratios of 0.25/0.75, 0.5/0.5 and 0.75/0.25 for steel and kenaf fibers, respectively. From the investigation, it was observed that fibers have minimal effect on compressive strength of the concrete. However, the findings suggest promising improvement on the flexural strength of the concrete added with hybrid fiber (up to 86%) as well as manages to change the mode of failure of the beam from brittle to a more ductile manner.

KEYWORDS:

Compressive strength; Hemp; Kenaf fibers; Mechanical properties; Steel fibers; Volume fraction