

ENHANCEMENT OF POLYPROPYLENE TWISTED BUNDLE FIBER ON THE MECHANICAL PROPERTIES OF HIGH STRENGTH OIL PALM SHELL LIGHTWEIGHT CONCRETE

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Abstract: This paper presents the results to compare the effect of polypropylene twisted bundle (PPTB) fibers in enhancing the mechanical properties of oil palm shell fiber-reinforced concrete (OPSFRC). The volume fraction (V_f) of 0.125%, 0.25%, 0.375% and 0.5% were studied for each fiber. As PPTB fibers were added into OPSFRC, the density reduction without reducing strength was reported. The results indicate that an increase in PPTB fiber decreased the workability. All the mixes reinforced with PPTB fibers improved significantly in mechanical properties. The 28 day compressive strength of PPTB fiber OPS high strength lightweight concrete (HSLWC) in continuously moist curing was in the range of 42-47 MPa. The splitting tensile/compressive strength and the flexural/compressive strength ratio of plain OPS concrete are comparable with artificial lightweight aggregate. An increase in the post-failure compressive toughness of OPSFRC of up to 29 % was reported in mixes reinforced with PPTB fiber. Hence, the findings of this study reveal that PPTB fiber can be used as an alternative material to reduce the density as well as to enhance HSLWC.