

Durability of Wood Shavel Composites with Environmental Friendly Based Binder

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Abstract : The composite element of 20 mm in thickness were manufactured using high volume fly ash, silica fume as alternative hydraulic binders and Portland cement Type II. Pine wood shavel as by product of local small wood working industries were used as the composite filler. The elements were given in situ wet and dry treatment for 9 months. Visually there is no fiber degradation as a result of the interaction of the environment. The assessment were done to the elements bending strength and dimensional properties. Increase in MoR after 180 days of exposure shown that mechanically this degradation is not seen yet. The increment of MoR (213%) compare to that of 28 days might be affected by the formation of calcium hydroxide (CH) or ettringite in the transition zone. The use of pozzolan showed also a delay or minimize degradation of composites while improving the pore structure, and minimize the mineralization of the fiber bond with the cement matrix. The water absorption is 4,22% at 180 days, 7,94% at 120 days and 12,38% at 28 days, in line with the 68% decrease in Thickness Swelling (TS). This unoccured degradation could also be affected by the presence of silica fume in the binder matrix. After 270 days of exposure under tropical condition, the flexural strength started to decrease.

Keywords : durability, fly ash, natural fibre, silica fume

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