

Water permeability and chloride and sulphate resistance of rubberised fibre mortar

ABSTRACT

Non-biodegradable solids such as waste tyres and oil palm fruit fibre (OPFF) would cause environmental problems if not disposed properly. This research studied the water permeability and chloride and sulphate resistance of mixes with addition of OPFF and sand replacement with Treated Crumb Rubber (TCR). The mix known as Rubberised Fibre Mortar (RFM) is a composite of 10% to 30% of TRC and addition of 1% to 1.5% of OPFF. In total sixteen different mixes, with water to cement ratio of 0.48 were prepared and subjected to related tests up to 56 days. The specimens are separated to two water curing types; immersion and spraying. The results show immersion cured specimens is less permeable and more resistance to chloride and sulphate than spraying specimens. The TCR does reduce the water permeability of the mix when 20% and less replacement made, while addition of less than 1% OPFF allows medium permeability. The moderate chloride resistance is achieved in mix with less than 10% TCR replacement and OPFF is not added. While sulphate resistance of RFM with less than 30% TCR is acceptable but addition of OPFF must be limited to 1% to prevent large strength reduction. In conclusion, for indoor mortar applications such as partition wall, RFM made of less than 10% TCR and less than 1% OPFF is recommended.

Keyword: Curing method; Durability; Oil palm fruit fibre; Rubberised fibre mortar; Treated crumb rubber