

Optimization of Bio-Based Mixture of Canarium Luzonicum and Calcium Oxide as Coating Material for Reinforcing Steel Bars

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Abstract : Philippines was moderately vulnerable to corrosion and to prevent this problem, surface coating should be applied. The main objective of this research was to develop and optimize a bio-based mixture of Pili Resin and Lime as Coating Materials. There are three (3) factors to be considered in choosing the best coating material such as chemical adhesion, friction, and the bearing/shear against the steel bar-concrete interface. Fortunately, both proportions of the Bio-based coating materials (50:50 and 65:35) do not have red rust formation complying with ASTM B117 but failed in terms of ASTM D 3359. Splitting failures of concrete were observed in the Unconfined Reinforced Concrete Samples. All of the steel bars (uncoated and coated) surpassed the Minimum Bond strength (NSCP 2015) about 203% to 285%. The experiments were about 1% to 3% of the results from the ANSYS Simulations with and without Salt Spray Test. Using the bio-based and epoxy coatings, normal splitting strengths were declined. However, there has no significant difference between the results. Thus, the bio-based coating materials can be used as an alternative for the epoxy coating materials and it was highly recommended for Low - Rise Building only.

Keywords : Canarium luzonicum, calcium oxide, corrosion, finite element simulations

Conference Title : ICAAMM 2021 : International Conference on Applied Analysis and Modelling of Materials

Conference Location : Dubai, United Arab Emirates

Conference Dates : November 08-09, 2021