

# EFFECTIVENESS OF PRE-TREATMENT METHOD TO HINDER REBAR CORROSION IN CONCRETE

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## ABSTRACT

The present work aims at evaluating the ability of phosphate pre-treatments applied on steel rebar's to hinder the corrosion reinforcements in a synthetic pore electrolyte contaminated by chloride ions and in mortar. The electrochemical behaviour of the pre-treated substrate was assessed by corrosion potential, polarization resistance and electrochemical impedance spectroscopy. The results have demonstrated that the treatment of the rebar by immersion in the Na<sub>3</sub>PO<sub>4</sub> (0.5M) solution favours the formation of a passive layer on the steel rebar surface, which is able to resist higher concentration of chlorides, up to 0.3M, to initiate corrosion. The pre-treatment also provides enhancement of corrosion protection of the steel rebar in mortar. The evolution of the impedance spectra with respect in function of chloride concentration are in a fairly good agreement with the results obtained by  $E_{\text{corr}}$  and  $j_{\text{corr}}$  measurements.

*Keywords:* Sodium Phosphate; Pre-treatment of rebars; Corrosion current density; EIS; Mortar.