

Corrosion characteristics of rebar in accelerated carbonation cured OPC and supplementary cementitious materials.

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ABSTRACT

Accelerated carbonation curing of cement-based mixtures was prepared to evaluate their performance to the corrosion characteristics. By mass, three mixtures were prepared with 100% OPC, 20% Flyash and 80% OPC, 50% Slag and 50% OPC. The binder/sand ratio was set at 1.0 and the w/c ratio at 0.5 for preparing the cement mortar. After being removed from the formwork, the mortar samples were kept in the carbonation chamber for a day at a concentration of 10% CO₂ gas. The carbonation chamber was maintained with the temperature and relative humidity of 25°C and 55% Rh, respectively. After completing the carbonation curing, the specimens were cured in the water. A multi-potentiostat was implemented for measuring the open circuit potential, corrosion current and other related parameters. The samples were immersed in 3% wt.% NaCl solution during evaluation period. The I_{corr} result shows that binder types have more influence than carbonation for corrosion initiation. Mixtures with a replacement of fly ash and slag resulted a lower corrosion current compared to OPC mixtures.

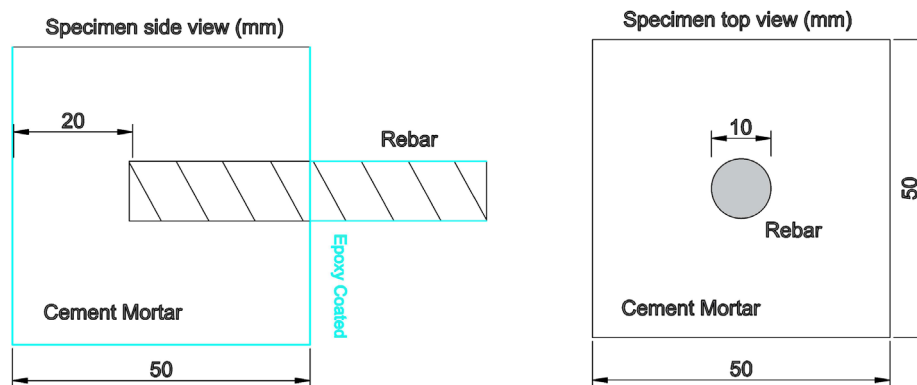


Fig.1. Rebar imbedded in the cement mortar, specimen side and top view.

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