

Corrosion of Steel Bars in Concrete Mixes Designed According to Different Codes Recommendations and Exposed to Variable Environmental Classes

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The scope of this research is to study experimentally the effect of mix design method and environmental exposure conditions on corrosion of steel bars. Three codes (ECP 203-2017, ACI 318-2019 and BS 8500-2019) were chosen to make a full comparison of corrosion of steel bars in reinforced concrete and behavior of concrete due to exposure classes. R.C. Compressive strength, splitting strength and corrosion of steel bars are tested at ages 28, 60, 90 and 180 days for samples immersed in pure water and sea water. The corrosion rate of steel bars in concrete immersed in pure water less than immersed in sea water for the three design mixes ECP, ACI and BS in addition the corrosion of steel in mix design of ACI generally less than the other two mix designs in pure water and sea water. Also, compressive strength of concrete and splitting strength in pure water larger than in sea water in the three design mixes (ECP, ACI and BS). Compressive strength of samples immersed in sea water of ECP and BS decreased with the increase of concrete age, while that of ACI samples continued in increasing up to 90 days (2%) and started in decreasing after that.

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