

Long-term performance of fusion-bonded epoxy-coated steel bars in chloride-contaminated concrete

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Abstract: This long-term research was conducted to evaluate the effect of holidays, surface damage, and chloride contamination on corrosion of fusion-bonded epoxy-coated (FBEC) steel bars. The effect of surface damage or pinholes and chloride contamination on corrosion of the metal substrate was evaluated by electrochemical and gravimetric weight loss techniques. Results of the electrochemical tests indicate that surface damage is more deleterious to FBEC steel bars than the pinholes in terms of corrosion. No significant variation was observed in the corrosion current density on the steel bars with the number of pinholes in the coating while it increased with an increase in the degree of damage to the coating. Similarly, the corrosion activity increased with an increase in the chloride concentration. A good correlation was noted between the corrosion rates measured by the linear polarization method and the gravimetric weight loss technique.