

Protection of Steel Bars in Reinforce Concrete with Zinc Based Coverings

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Abstract : There is no doubt that reinforced concrete is known as one of the most significant materials which is used in construction industry for many years. Although, some natural elements in dealing with environment can contribute to its corrosion or failure. One of which is bar or so-called reinforcement failure. So as to combat this problem, one of the oxidization prevention methods investigated was the barrier protection method implemented over the application of an organic coating, specifically fusion-bonded epoxy. In this study comparative method is prepared on two different kinds of covered bars (zinc-riches epoxy and polyamide epoxy coated bars) and also uncoated bar. With the aim of evaluate these reinforced concretes, the stickiness, toughness, thickness and corrosion performance of coatings were compared by some tools like Cu/CuSo4 electrodes, EIS and etc. Different types of concretes were exposed to the salty environment (NaCl 3.5%) and their durability was measured. As stated by the experiments in research and investigations, thick coatings (named epoxies) have acceptable stickiness and strength. Polyamide epoxy coatings stickiness to the bars was a bit better than that of zinc-rich epoxy coatings; nonetheless it was stiffer than the zinc rich epoxy coatings. Conversely, coated bars with zinc-rich epoxy showed more negative oxidization potentials, which take revenge protection of bars by zinc particles. On the whole, zinc-rich epoxy coverings is more corrosion-proof than polyamide epoxy coatings due to consuming zinc elements and some other parameters, additionally if the epoxy coatings without surface defects are applied on the rebar surface carefully, it can be said that the life of steel structures is subjected to increase dramatically.

Keywords : surface coating, epoxy polyamide, reinforce concrete bars, salty environment

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