

## **Fundamental Research on Factors Affecting the Under-Film Corrosion Behavior of Coated Steel Members**

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**Abstract :** Firstly, in order to examine the influence of the remaining amount of the rust on the coating film durability, the accelerated deterioration tests were carried out. In order to prepare test specimens, uncoated steel plates were corroded by the Salt Spray Test (SST) prior to the accelerated deterioration tests, and then the prepared test specimens were coated by epoxy resin and phthalic acid resin each of which has different gas-barrier performance. As the result, it was confirmed that the under-film corrosion occurred in the area and the adjacency to great quantities of salt exists in the rust, and did not occurred in the specimen which was applied the epoxy resin paint after the surface preparation by the power tool. Secondly, in order to clarify the influence of the corrosive factors on the coating film durability, outdoor exposure tests were conducted for one year on actual steel bridge located at a coastal area. The tests specimens consist of coated corroded plates and the uncoated steel plates, and they were installed on the different structural members of the bridge for one year. From the test results, the uncoated steel plates which were installed on the underside of the member are easily corrosive and had highly correlation with the amount of salt in the rust. On the other hand, the most corrosive under-film steel was the vertical surface of the web plate. Thus, it was confirmed that under-film corrosion rate was not match with corrosion rate of the uncoated steel. Consequently, it is estimated that the main factors of under-film corrosion are gas-barrier property of coating film and corrosive factors such as water vapor and temperature. The salt which significantly corrodes the uncoated steel plate is not directly related to the under-film corrosion.

**Keywords :** accelerated deterioration test, coating durability, environmental factor, under-film corrosion

**Conference Title :** ICCCE 2016 : International Conference on Construction and Civil Engineering

**Conference Location :** London, United Kingdom

**Conference Dates :** February 25-26, 2016