

Atmospheric Corrosion Behaviors of Steels in Japan

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Abstract

At present, the mainstream method of classifying environmental corrosion is that specified in ISO 9223. This is a method in which the corrosion rates of various metals are classified in 6 levels based on the results of direct exposure tests conducted at 52 locations around the world. However, because the exposure sites are located mainly in the European region, standardization of an evaluation/classification method suited to the Asian region has been strongly desired. Therefore, exposure tests were conducted in three countries, Japan, Vietnam and Thailand, under “e-Asia Project”. In this paper, the exposure test results for carbon steel and weathering steel in Japan are reported. The values of corrosion rate of carbon steel, CR[CS], increase with increasing temperature, T , where $T > 10^{\circ}\text{C}$, while the CR[CS] values slightly increase with decreasing T where $T < 10^{\circ}\text{C}$. The CR[CS] values are affected by amount of airborne salinity, S , where $S > 0.03\text{mdd}$, while they are not affected by S where $S < 0.03\text{mdd}$. The dependence of CR[CS] on S is stronger in the Pacific side and Inland than in Japan sea side. It is also confirmed that corrosion rate of weathering steel is almost same to that of carbon steel during 1 year exposure.