

Evaluation of Corrosion Behaviour of Coatings Applied in a High-Strength Low Alloy Steel in Different Climatic Cabinets

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Abstract : Corrosion is one of the most concerning phenomenon that accelerates material degradation in offshore applications. In order to avoid the premature failure of metallic materials in marine environments, organic coatings have widely been used, due to their elevated corrosion resistance. Thermally-sprayed metals have recently been used in offshore applications, whereas ceramic materials are usually less employed, due to their high cost. The protectiveness of the coatings can be evaluated and categorized in corrosivity categories in accordance with the ISO 12944-6 Standard. According to this standard, for coatings that are supposed to work in marine environments, a C5-M category is required for components working out of the water or partially immersed in the splash zone, and an Im2 category for totally immersed components. C5-M/Im-2 high category would correspond to a durability of more than 20 years without maintenance in accordance with ISO 12944 and NORSOK M501 standards. In this work, the corrosion behavior of three potential coatings used in offshore applications has been evaluated. For this aim, the materials have been subjected to different environmental conditions in several climatic chambers (humidostatic, climatic, immersion, UV and salt-fog). The category of the coatings to each condition has been selected, in accordance with the previously mentioned standard.

Keywords : cabinet, coatings, corrosion, offshore

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