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A Review of Test Protocols for Assessing Coating Performance of Water Ballast Tank Coatings

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Abstract : Concerns on corrosion and effective coating protection of double hull tankers and bulk carriers in service have been raised especially in water ballast tanks (WBTs). Test protocols/methodologies specifically that which is incorporated in the International Maritime Organisation (IMO), Performance Standard for Protective Coatings for Dedicated Sea Water ballast tanks (PSPC) are being used to assess and evaluate the performance of the coatings for type approval prior to their application in WBTs. However, some of the type approved coatings may be applied as very thick films to less than ideally prepared steel substrates in the WBT. As such films experience hygrothermal cycling from operating and environmental conditions, they become embrittled which may ultimately result in cracking. This embrittlement of the coatings is identified as an undesirable feature in the PSPC but is not mentioned in the test protocols within it. There is therefore renewed industrial research aimed at understanding this issue in order to eliminate cracking and achieve the intended coating lifespan of 15 years in good condition. This paper will critically review test protocols currently used for assessing and evaluating coating performance, particularly the IMO PSPC.

Keywords : corrosion test, hygrothermal cycling, coating test protocols, water ballast tanks
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