

Accepted Manuscript

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PII: S0167-7322(18)30710-4
DOI: [doi:10.1016/j.molliq.2018.08.053](https://doi.org/10.1016/j.molliq.2018.08.053)
Reference: MOLLIQ 9498
To appear in: *Journal of Molecular Liquids*
Received date: 1 March 2018
Revised date: 24 July 2018
Accepted date: 10 August 2018



Please cite this article as: Abass A. Olajire , Recent advances on organic coating system technologies for corrosion protection of offshore metallic structures. Molliq (2018), doi:[10.1016/j.molliq.2018.08.053](https://doi.org/10.1016/j.molliq.2018.08.053)

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Recent advances on organic coating system technologies for corrosion protection of offshore metallic structures

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Abstract

Coatings for corrosion protection of metallic substrates such as steel, iron, magnesium, and aluminium, and their alloys have attracted tremendous interest in the offshore industry. Offshore facilities are prone to corrosion in various zones, ranging from atmospheric, splash, submerged and mud zones. Thus, there is high demand for prevention of corrosion of offshore facilities using organic coatings as potential replacements for the traditional coatings that are inefficient and expensive. This review highlights the latest developments in the corrosion protective performance of various types of organic coating systems. These coating systems are expected to provide barrier and active protection at varying degrees to offshore metallic structures in these corrosion zones. Thus, the utilization of organic coatings in complex and aggressive environmental conditions such as offshore, for efficient control of the initiation of metallic degradation, structural failures, and resource depletion is highly desirable by offshore industry to ensure safe and productive drilling operations. The effects of various loading systems on the performance of organic coatings are also discussed.

Keywords: corrosion protection; metallic substrates; organic coatings; hybrid coatings; green coatings; loading systems

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