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A Novel Non-skid Composite Coating with Higher Corrosion Resistance

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Abstract

In this work, low-pressure cold-sprayed Ni-Zn-Al₂O₃ intermediate layers were deposited between supersonic-plasma-sprayed NiCr-Cr₃C₂ surface layers and underlying low-carbon steel layers to form a sandwich structure that enhances the corrosion resistance of non-skid NiCr-Cr₃C₂ coatings. The corrosion performance of these bi-layer non-skid coatings and that of a single-layer coating were investigated through electrochemical measurements and observations of their corrosion morphologies. The novel non-skid coating with a top layer possessing a fine powder grain size exhibited the best corrosion resistance because of the pseudopassivation of the interlayer and physical barriers created by the corrosion process. The intermediate layer substantially improved the corrosion resistance of the non-skid coatings.

Keywords: Corrosion resistance; Supersonic plasma spraying; Non-skid coatings; EIS; Salt spray corrosion

1. Introduction

¹ These authors contributed equally to this work.

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