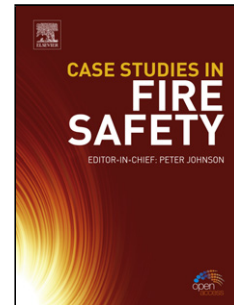


Accepted Manuscript

Title: Electrochemical impedance spectroscopy of scribed coated steel after salt spray testing

Author: E.D. Kiosidou A. Karantonis G.N. Sakalis D.I. Pantelis



PII: S0010-938X(17)32056-5
DOI: <https://doi.org/doi:10.1016/j.corsci.2018.03.037>
Reference: CS 7453

To appear in:

Received date: 16-11-2017
Revised date: 13-3-2018
Accepted date: 19-3-2018

Please cite this article as: E.D. Kiosidou, A. Karantonis, G.N. Sakalis, D.I. Pantelis, Electrochemical impedance spectroscopy of scribed coated steel after salt spray testing, *Corrosion Science* (2018), <https://doi.org/10.1016/j.corsci.2018.03.037>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Electrochemical impedance spectroscopy of scribed coated steel after salt spray testing

E.D. Kiosidou^{a,*}, A. Karantonis^b, G.N. Sakalis^c, D.I. Pantelis^a

^a*Shipbuilding Technology Laboratory, Division of Marine Structures, School of Naval Architecture and Marine Engineering, National Technical University of Athens, 9 Heroon Polytechniou Ave.,15780,Zografos, Athens, Greece*

^b*Laboratory of Physical Chemistry and Applied Electrochemistry, Department of Materials Science and Engineering, School of Chemical Engineering, National Technical University of Athens, 9 Heroon Polytechniou Ave.,15780,Zografos, Athens, Greece*

^c*Division of Marine Engineering, School of Naval Architecture and Marine Engineering, National Technical University of Athens, 9 Heroon Polytechniou Ave.,15780,Zografos, Athens, Greece*

Abstract

In the present study, various representative models of finite length diffusion impedance were examined, in order to find the optimum description for dissolved oxygen diffusion, during corrosion of scribed coated steel in cyclic salt spray conditions, at 6, 8 and 12-week intervals. Modified restricted diffusion fitted the experimental data after 6 and 8 weeks and modified restricted or modified transmissive could fit the data after 12 weeks, accompanied by a decrease in corrosion resistance. Oxygen would diffuse through the porous corrosion layer and reduce on the magnetite layer, lying on top of the electrode surface.

Keywords: A. Carbon steel; A. Organic coatings; B. EIS; B. Polarization; C. Oxygen reduction; C. Rust

1. Introduction

The use of painting systems is important for protection of metallic structures from their environment. The appropriate painting system should withstand the specific environmental conditions and provide long-lasting protec-

*Corresponding author

Email address: evakios@central.ntua.gr (E.D. Kiosidou)

Download English Version:

<https://daneshyari.com/en/article/7893519>

Download Persian Version:

<https://daneshyari.com/article/7893519>

[Daneshyari.com](https://daneshyari.com)