

## PAPER

# Corrosion response of ultra-high strength steels used

Husnu Gerengi<sup>1</sup>, Nuri Sen<sup>1</sup>, Ilyas Uygur<sup>1</sup> and Moses M Solomon<sup>2</sup>

Published 24 May 2019 • © 2019 IOP Publishing Ltd

[Materials Research Express](#), Volume 6, Number 8 Citation Husnu Gerengi *et al* 2019 *Mater. Res. Express* 6 0865a6 DOI 10.1088/2053-1591/ab2178

## Abstract

The corrosion resistance properties of two ultra-high strength steels, Docol 1200 and 1400 were studied in 3.5 wt% NaCl solution using chemical and electrochemical techniques supported by surface characterization techniques namely scanning electron microscope (SEM), energy dispersive spectroscopy (EDX), atomic force microscope (AFM), and optical profilometer. The mechanical properties of both Docol 1200 and Docol 1400 uncorroded and corroded were determined by tensile test. Results obtained reveal that the two alloys exhibit similar mechanical properties. Corrosion has effect on the mechanical properties of the alloys. Corrosion studies reveal that both Docol 1200 and 1400 are prone to corrosion in NaCl environment. A corrosion rate of 30.6 mpy and 49.6 mpy was recorded for a Docol 1200 at 25 °C and 60 °C, respectively. For Docol 1400, the corrosion rate obtained at 25 °C and 60 °C was 32.7 mpy and 52.4 mpy, respectively. Docol 1200 is adjudged to exhibit superior corrosion resistance property than Docol 1400. The optical profilometric results disclose that Docol 1200 and Docol 1400 suffered pitting corrosion in NaCl solution. Pitting corrosion was more severe with Docol 1400 than 1200.

Export citation and abstract [BibTeX](#) [RIS](#)

[Previous article in issue](#)

[Next article in issue](#)

## Access this article

The computer you are using is not registered by an institution with a subscription to this article. Please choose one of the options below.

### Login

[IOPscience login](#)

Find out more about journal [subscriptions at your site](#).

**Purchase from**

[Article Galaxy](#)

[CCC RightFind](#)

Purchase this article from our trusted document delivery partners.

- 
- [Abstract](#)