



Journal of the Japan Society of  
**Naval Architects and Ocean Engineers**  
*The Japan Society of Naval Architects and Ocean Engineers*

[Available Volumes](#) | [Japanese](#) >> [Publisher Site](#)

Author:  [ADVANCED](#) | Volume  Page   
Keyword:   |



[TOP](#) > [Available Volumes](#) > [Table of Contents](#) > Abstract

ONLINE ISSN : 1881-1760

PRINT ISSN : 1880-3717

**Journal of the Japan Society of Naval Architects and Ocean Engineers**

Vol. 4 (2006) pp.239-245

[\[PDF \(1044K\)\]](#) [\[References\]](#)

## On Strength and Deformability of Corroded Steel Plates by Using Reproduced Specimens

[Yoichi Sumi](#), [Nobutaka Yamamura](#) and [Yusuke Yamamuro](#)

(Received August 11, 2006)

**Summary:** The strength and deformability of corroded steel plates are of great interest for the proper evaluation of structural integrity of aged marine structures. In the present paper, the authors use a CAM system which numerically controls a desktop milling machine to reproduce the surface geometry of a corroded surface. Surface data may be generated by a CAD system by the assembly of simulated pits of certain shapes such as cone or partial spherical shapes, or by numerically simulated arbitrary surfaces. Also, corroded surfaces may be measured by scanned the plate by a laser displacement sensor, so that the surface data are stored in the CAD system to generate the input for the CAM system. In order to investigate the effects of surface pits, three kinds of periodically distributed surface pits are machined on the both sides of specimens, where geometrically similar specimens, whose sizes are a half and a quarter of the original ones, respectively, are also used to investigate the size effect to the strength and deformability of the specimens. It will be seen that the size effect can be disregarded so that valid data can be obtained by scaled model experiments. As a typical example of plates with general corrosion, surface geometries of a sample specimen taken from the bottom plate of MS Nakhodka are reproduced, and the corresponding tensile test are carried out. The results show a slight reduction of the tensile strength, while the plastic deformation is reduced considerably. In order to examine the extent of the corroded surface, test specimens having different size but the same thickness are tested, where the surface undulation is machined in the original scale.

[\[PDF \(1044K\)\]](#) [\[References\]](#)

Download Meta of Article [\[Help\]](#)

[RIS](#)

To cite this article:

Yoichi Sumi, Nobutaka Yamamura and Yusuke Yamamuro: On Strength and Deformability of Corroded Steel Plates by Using Reproduced Specimens , Journal of the Japan Society of Naval Architects and Ocean Engineers, (2006), Vol. 4, pp.239-245 .

Copyright (c) 2007 The Japan Society of Naval Architects and Ocean Engineers

---



---

[Japan Science and Technology Information Aggregator, Electronic](#)

