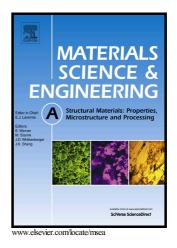
# Author's Accepted Manuscript

Influence of graded compositions and carbon diffusivities in buttering on structural integrity of dissimilar metal welds

Dinesh W. Rathod, R.K. Raj Singh, Sunil Pandey, S. Aravindan, P.K. Singh



PII:S0921-5093(17)30931-0DOI:http://dx.doi.org/10.1016/j.msea.2017.07.036Reference:MSA35284

To appear in: Materials Science & Engineering A

Received date: 25 May 2017 Revised date: 11 July 2017 Accepted date: 14 July 2017

Cite this article as: Dinesh W. Rathod, R.K. Raj Singh, Sunil Pandey, S Aravindan and P.K. Singh, Influence of graded compositions and carbon diffusivities in buttering on structural integrity of dissimilar metal welds *Materials* Science & Engineering A http://dx.doi.org/10.1016/j.msea.2017.07.036

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable 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

## Influence of graded compositions and carbon diffusivities in

## buttering on structural integrity of dissimilar metal welds

### Authors

Dinesh W. Rathod<sup>1,\*a</sup>, R. K. Raj Singh<sup>2</sup>, Sunil Pandey<sup>1</sup>, S. Aravindan<sup>1</sup>, P. K. Singh<sup>3</sup>

\*Corresponding author - email: dineshvrathod@gmail.com, Tel.: +44 161 2751916

<sup>a</sup> Present address: MTRL, School of Mechanical Aerospace and Civil Engineering, The University of Manchester, United Kingdom, M13 9PL

<sup>1</sup> Department of Mechanical Engineering, Indian Institute of Technology Delhi, New Delhi-110016,

### India

<sup>2</sup> Department of Applied Mechanics, Indian Institute of Technology Delhi, New Delhi-110016, India
<sup>3</sup> Reactor Safety Division, Bhabha Atomic Research Centre, Mumbai-400085, India

#### Abstract

Aim of the paper is to understand the effect of heterogeneity (graded composition) in buttering on the structural and mechanical properties in terms of integrity assessment of the dissimilar metal weld (DMW) joints. The metallurgical, microstructural and mechanical properties investigation of four types of DMW joints between SA508Gr.3Cl.1 (low alloy steel) and SS304LN (stainless steel) using an intermediate layer of Ni-Fe alloy in buttering as a graded composition have been carried out. The graded compositions and carbon diffusivities governs the microstructure in buttering deposits and that could directly affect the mechanical properties of the weld joints. These behaviours were investigated and explained in connection with the microstructural features those were changed due to mixed (graded) weld chemistry. The weld chemistry variations due Ni-Fe layer have significantly affects the distortion behaviour of the joints. The graded composition and associated carbon diffusivities due to Ni-Fe layers have confirmed the positive changes in the yield strength mismatch behaviour, plastic instability strength, tensile properties, interfacial properties and metallurgical properties. The measure of yield strength ratio has been modified in accordance to the distinctive

Download English Version:

https://daneshyari.com/en/article/5455841

Download Persian Version:

https://daneshyari.com/article/5455841

Daneshyari.com