

Author's Accepted Manuscript

Influence of shot peening and plasma ion nitriding on tensile strength of 2205 duplex stainless steel using A-PAW

R. Selvabharathi, R. Muralikannan



PII: S0921-5093(17)31394-1
DOI: <https://doi.org/10.1016/j.msea.2017.10.068>
Reference: MSA35671

To appear in: *Materials Science & Engineering A*

Received date: 23 August 2017
Revised date: 19 October 2017
Accepted date: 20 October 2017

Cite this article as: R. Selvabharathi and R. Muralikannan, Influence of shot peening and plasma ion nitriding on tensile strength of 2205 duplex stainless steel using A-PAW, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2017.10.068>

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 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 shot peening and plasma ion nitriding on tensile strength of 2205 duplex stainless steel using A-PAW

R.Selvabharathi¹, R.Muralikannan¹

¹ Department of Mechanical Engineering, Sethu Institute of Technology, Pulloor, Kariapatti-626 115, Tamil Nadu, India.

*Corresponding author: krsbharathi@gmail.com

Abstract

The present study shows the effect of plasma ion nitriding and shot peening process on the microstructure, tensile, bending strength and hardness of 2205 duplex stainless steel joint materials by employing plasma arc welding (A-PAW). Double shot air blast shock peening DABSP was achieved on the 2205 duplex stainless steel to analyze the strength in the pre-peening and peening weld treatment. After welding process, tensile failure occurred in the fusion zone of the material joint for both pre peening and peening process. It was confirmed that the yield and tensile strength of the welded joints improved significantly after DABSP in the weld and heat affected regions of the weldments. To improve the hardness of 2205 duplex stainless steel, plasma ion nitriding process was conducted at 480°C for 9 h in peened condition. The investigation of samples prepared by pre-peening, peening and plasma ion nitriding were conducted at the fusion zone by employing scanning electron microscopy, X-ray diffractometry and transmission electron microscopy techniques. Residual stress analysis was carried out on the materials coupons using X-ray Diffraction analysis. The present study expressed that the CrN is not formed after performing plasma ion nitriding and shot peening which resulted in better tensile and bending strength.

Keyword: Air blast shock peening, Plasma ion nitriding, Micro structure, Tensile strength

Download English Version:

<https://daneshyari.com/en/article/7974622>

Download Persian Version:

<https://daneshyari.com/article/7974622>

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