

Accepted Manuscript

Effect of temperature on microstructure and residual stresses induced by surface treatments in Inconel 718 SPF

Abhishek Telang, Amrinder S. Gill, Seetha R. Mannava, Dong Qian, Vijay K. Vasudevan



PII: S0257-8972(18)30221-4
DOI: doi:[10.1016/j.surfcoat.2018.02.094](https://doi.org/10.1016/j.surfcoat.2018.02.094)
Reference: SCT 23165

To appear in: *Surface & Coatings Technology*

Received date: 7 October 2017
Revised date: 25 February 2018
Accepted date: 26 February 2018

Please cite this article as: Abhishek Telang, Amrinder S. Gill, Seetha R. Mannava, Dong Qian, Vijay K. Vasudevan , Effect of temperature on microstructure and residual stresses induced by surface treatments in Inconel 718 SPF. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi:[10.1016/j.surfcoat.2018.02.094](https://doi.org/10.1016/j.surfcoat.2018.02.094)

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.

Effect of temperature on microstructure and residual stresses induced by surface treatments in Inconel 718 SPF

Abhishek Telang^{1*}, Amrinder S. Gill², Seetha R. Mannava¹, Dong Qian³, Vijay K. Vasudevan¹

¹Department of Mechanical and Materials Engineering, University of Cincinnati, Cincinnati, OH 45221-0072, U.S.A.

²AK Steel Research Center, Middletown, OH, USA

³Department of Mechanical Engineering, University of Texas at Dallas, Richardson, TX, USA

*corresponding author information

Title: Dr.

First Name: Abhishek

Last name: Telang

Phone: +1 513-556-3119

Fax: +1 513-556-3390

Email: telangam@mail.uc.edu

Mail Address:

Department of Mechanical and Materials Engineering, University of Cincinnati

501B ERC, 2901 Woodside Drive,

Cincinnati, OH, USA 45221-0072

Abstract

In this study, Inconel 718 (IN718SPF) samples were treated with three surface modification techniques: laser shock peening (LSP), cavitation shotless peening (CSP) and ultrasonic nanocrystalline surface modification (UNSM). Subsequently, these samples were exposed to temperatures between 550°C- 650°C for different time intervals. Residual stresses on the sample surfaces were measured using XRD to compare the thermal relaxation behavior of samples treated with different surface treatments. The results show that surface compressive residual stresses induced by all three surface treatments are stable at high temperatures after initial relaxation. Further, TEM micrographs were obtained from surface treated samples that were exposed to 550°C for 5 minutes and 24 hours. A comparison of microstructures before and after thermal exposure is presented. The study quantifies activation enthalpy for residual stresses

Download English Version:

<https://daneshyari.com/en/article/8023725>

Download Persian Version:

<https://daneshyari.com/article/8023725>

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