

Accepted Manuscript

Effects of conventional, severe, over, and re-shot peening processes on the fatigue behavior of mild carbon steel

Erfan Maleki, Okan Unal, Kazem Reza Kashyzadeh



PII: S0257-8972(18)30207-X
DOI: [doi:10.1016/j.surfcoat.2018.02.081](https://doi.org/10.1016/j.surfcoat.2018.02.081)
Reference: SCT 23152
To appear in: *Surface & Coatings Technology*
Received date: 5 September 2017
Revised date: 17 February 2018
Accepted date: 21 February 2018

Please cite this article as: Erfan Maleki, Okan Unal, Kazem Reza Kashyzadeh , Effects of conventional, severe, over, and re-shot peening processes on the fatigue behavior of mild carbon steel. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi:[10.1016/j.surfcoat.2018.02.081](https://doi.org/10.1016/j.surfcoat.2018.02.081)

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.

Effects of conventional, severe, over, and re-shot peening processes on the fatigue behavior of mild carbon steel

Erfan Maleki^{a,*}, Okan Unal^b, Kazem Reza Kashyzadeh^a

^a Mechanical Engineering Department, Sharif University of Technology-International Campus, Kish Island, Iran

^b Mechanical Engineering Department, Karabuk University, Karabuk, Turkey

*Corresponding author, email address: maleki_erfan@kish.sharif.edu, Phone: +989125427218

Abstract

The present study investigates experimentally the effects of different shot peening treatments, including conventional, severe, over, and re-shot peening on microstructure, mechanical properties, and fatigue behavior of AISI 1050 mild carbon steel. Different shot peening treatments were performed using various effective parameters by considering the influences of increasing Almen intensity and coverage. Optical microscopy and field emission scanning electron microscopy observations and X-Ray diffraction measurements were carried out to analyze grains refinement in each shot peening treatment. Microhardness and residual stress measurements were taken from shot peened surfaces to the core material to investigate the mechanical properties. The fatigue behaviors of the specimens were examined by using the axial fatigue test. The results indicated that post-grinding, re-shot peening, and severe shot peening processes have significant effects on fatigue life improvement.

Key words: fatigue behavior, severe plastic deformation, shot peening, microstructure, mechanical properties,

1. Introduction

Most failures in engineering components are due to mechanical and metallurgical properties of the materials' surface, and in most cases such failures originate from the exterior layers of components [1]. Therefore, improving surface layer properties has become a topic which has attracted considerable interest. In enhancing surface properties, especially in metallic materials, grains refinement and the creation of compressive residual stress (CRS) in the surface play important roles; these techniques have positive effects on materials' behavior such as fracture, fatigue, corrosion, wear, and crack arrestment [2-4, 52].

Download English Version:

<https://daneshyari.com/en/article/8023716>

Download Persian Version:

<https://daneshyari.com/article/8023716>

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