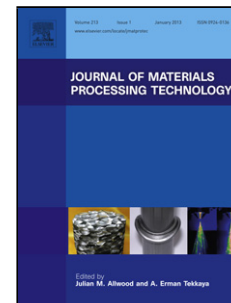


Accepted Manuscript

Title: Microstructural adjustment of carburized steel components towards reducing the quenching-induced distortion

Authors: H. Farivar, U. Prah, M. Hans, W. Bleck



PII: S0924-0136(18)30382-0
DOI: <https://doi.org/10.1016/j.jmatprotec.2018.08.040>
Reference: PROTEC 15905

To appear in: *Journal of Materials Processing Technology*

Received date: 19-2-2018
Revised date: 26-8-2018
Accepted date: 28-8-2018

Please cite this article as: Farivar H, Prah U, Hans M, Bleck W, Microstructural adjustment of carburized steel components towards reducing the quenching-induced distortion, *Journal of Materials Processing Tech.* (2018), <https://doi.org/10.1016/j.jmatprotec.2018.08.040>

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.

Microstructural adjustment of carburized steel components towards reducing the quenching-induced distortion

H. Farivar ^a, U. Prahl ^{a, b}, M. Hans ^c, W. Bleck ^a

^a *Steel Institute (IEHK), RWTH Aachen University, Intzestr. 1, 52072 Aachen, Germany*

^b *Institute of Metal Forming (imf), Technische Universität Bergakademie Freiberg, Bernhard-von-Cotta-Str. 4, 09599 Freiberg, Germany*

^c *Materials Chemistry (MCh), RWTH Aachen University, Kopernikusstr. 10, 52074 Aachen, Germany*

*Corresponding Author: **H. Farivar**

Scientific Researcher at Materials Simulation Group
Faculty of Georesources and Materials Engineering (Faculty No.: 5)
IEHK- Steel Institute
RWTH Aachen University
Intzestr. 1
D-52072 Aachen, Germany
Tel: +49 241 80 95823
Fax: +49 241 80 92253
E-Mail: Hamidreza.Farivar@IEHK.RWTH-Aachen.de
Web: www.iehk.rwth-aachen.de

Declarations of interest: **none**

ABSTRACT

It is crucial to control and minimize the geometrical distortions resulted from the application of carburizing and quenching processes. This is particularly of the utmost importance for high quality steel products such as power transmission components which require high performance and dimensional precision in the range of micrometers. Carburized steel components are quenched from hardening temperature to room temperature to acquire a very hard martensitic layer (case). During the quenching process, due to the phase transformation-induced volumetric expansion in case and the interior region (core), unwanted dimensional changes may occur. In the present work, the effects of a modified hardening temperature and different soaking times on the core microstructure, the final dimensional stability and the mechanical properties are systematically investigated. Navy C-ring specimens are employed to quantify and correlate the effect of the developed microstructural constituents, magnitude of

Download English Version:

<https://daneshyari.com/en/article/11029881>

Download Persian Version:

<https://daneshyari.com/article/11029881>

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