

Accepted Manuscript

Title: A comprehensive investigation on temperature dependent plastic deformation behavior of one austenitic stainless steel

Authors: Feifei Zhang, David Harsch, Niko Manopulo, Maysam Gorji, Pavel Hora



PII: S0924-0136(17)30585-X
DOI: <https://doi.org/10.1016/j.jmatprotec.2017.12.002>
Reference: PROTEC 15539

To appear in: *Journal of Materials Processing Technology*

Received date: 14-10-2017
Revised date: 30-11-2017
Accepted date: 1-12-2017

Please cite this article as: Zhang, Feifei, Harsch, David, Manopulo, Niko, Gorji, Maysam, Hora, Pavel, A comprehensive investigation on temperature dependent plastic deformation behavior of one austenitic stainless steel. *Journal of Materials Processing Technology* <https://doi.org/10.1016/j.jmatprotec.2017.12.002>

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.

A comprehensive investigation on temperature dependent plastic deformation behavior of one austenitic stainless steel

Feifei Zhang^{a,b1}, David Harsch^a, Niko Manopulo^a, Maysam Gorji^a, Pavel Hora^a

^a ETH Zurich, Institute of Virtual Manufacturing, Tannenstrasse 3, 8092, Zurich, Switzerland

^b Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, 518055, Shenzhen, China

Abstract:

The austenitic stainless steels are widely used in various industries due to its excellent properties. However, because of the martensitic phase transformation during the forming process, the austenitic stainless steels involve much more complex deformation behavior in comparison to the normal structure steels. Here in this paper, the deformation behavior of one austenitic stainless steel-Posco 1.4301, including the hardening behavior, yield behavior and formability behavior under different temperatures are comprehensively investigated by experimental, theoretical and finite element methods. Results show that martensitic phase transformation, which is related with temperature and strain, can greatly influence the plastic deformation behavior. This study provides a comprehensive understanding of the mechanical properties of this austenitic stainless steel and helps to better analyze the more complex deformation process in the future.

Keyword: Martensitic phase transformation; Forming limit; Austenitic stainless steel; Finite element simulation

1. Introduction

Stainless steels have a big potential in forming application for vessels, kitchen, building, and transportation, et al. because of their good corrosion resistance, excellent mechanical properties and

¹ Corresponding Author. Tel.: +86 755 86392156; fax: +86 755 98392299
E-mail Address: ff.zhang@siat.ac.cn (F. Zhang)

Download English Version:

<https://daneshyari.com/en/article/7176419>

Download Persian Version:

<https://daneshyari.com/article/7176419>

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