

# Author's Accepted Manuscript

Thermal and mechanical stability of retained austenite surrounded by martensite with different degrees of tempering

J. Hidalgo, K.O. Findley, M.J. Santofimia



PII: S0921-5093(17)30306-4  
DOI: <http://dx.doi.org/10.1016/j.msea.2017.03.017>  
Reference: MSA34800

To appear in: *Materials Science & Engineering A*

Received date: 19 November 2016  
Revised date: 3 March 2017  
Accepted date: 5 March 2017

Cite this article as: J. Hidalgo, K.O. Findley and M.J. Santofimia, Thermal and mechanical stability of retained austenite surrounded by martensite with different degrees of tempering, *Materials Science & Engineering A* <http://dx.doi.org/10.1016/j.msea.2017.03.017>

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

**Thermal and mechanical stability of retained austenite surrounded by martensite with different degrees of tempering**

J. Hidalgo<sup>a,\*</sup>, K.O. Findley<sup>b</sup>, M.J. Santofimia<sup>a</sup>

<sup>a</sup>Department of Materials Science and Engineering, Delft University of Technology, Mekelweg 2, 2628 CD Delft, The Netherlands

<sup>b</sup>G.S. Ansell Department of Metallurgical and Materials Engineering, Colorado School of Mines, Golden, CO, USA

\*Corresponding author. Tel.: +31(0) 15 27 87459, J.HidalgoGarcia@tudelft.nl

**Abstract**

The mechanical and thermal stability of austenite in multiphase advanced high strength steels are influenced by the surrounding microstructure. The mechanisms underlying and the relations between thermal and mechanical stability are still dubious due to the difficulty of isolating other factors influencing austenite stability. In this work, martensite/austenite microstructures were created with the only significant difference being the degree of tempering of the martensite matrix. Hence, the effect of tempering in martensite is isolated from other factors influencing the stability of austenite. The thermal stability during heating of retained austenite was evaluated by monitoring phase fractions as a function of controlled temperature employing both dilatometry and magnetometry measurements. The mechanical stability was studied by performing interrupted tensile tests and determining the remaining austenite fraction at different levels of strain. The thermal stability of this remaining austenite after interrupted tests was studied by subsequent reheating of strained specimens. The results are evidence for the first time that thermal recovery of martensite during reheating assists austenite

Download English Version:

<https://daneshyari.com/en/article/5455962>

Download Persian Version:

<https://daneshyari.com/article/5455962>

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