

Accepted Manuscript

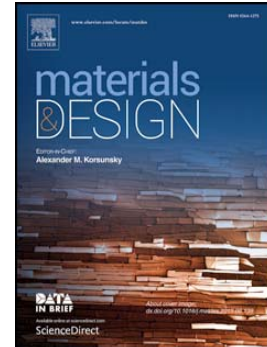
Super strong and highly ductile low alloy multiphase steels consisting of bainite, ferrite and retained austenite

A. Varshney, S. Sangal, S. Kundu, K. Mondal

PII: S0264-1275(16)30079-X
DOI: doi: [10.1016/j.matdes.2016.01.078](https://doi.org/10.1016/j.matdes.2016.01.078)
Reference: JMADE 1279

To appear in:

Received date: 2 December 2015
Revised date: 16 January 2016
Accepted date: 19 January 2016



Please cite this article as: A. Varshney, S. Sangal, S. Kundu, K. Mondal, Super strong and highly ductile low alloy multiphase steels consisting of bainite, ferrite and retained austenite, (2016), doi: [10.1016/j.matdes.2016.01.078](https://doi.org/10.1016/j.matdes.2016.01.078)

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.

**Super strong and highly ductile low alloy multiphase steels
consisting of bainite, ferrite and retained austenite**

A.Varshney¹, S.Sangal¹, S.Kundu², K.Mondal^{1*}

¹Department of Materials Science and Engineering,
Indian Institute of Technology Kanpur, UP, India - 208016

²Research & Development and Scientific Services,
Tata Steel Limited, Jamshedpur, Jharkhand, India – 831001

Abstract

A moderately high carbon (0.61%) high silicon steel was subjected to a newly designed heat treatment cycle consisting of continuous cooling for different duration after austenitization followed by austempering at 300, 350 and 400°C to form a very high strength and highly ductile multiphase steels with microstructures consisting of varied amounts of ferrite (formed during continuous cooling), bainite (formed during austempering) and retained austenite. Steels with very high strength up to (tensile strength ~ 1100-2000 MPa) along with excellent ductility (elongation ~ 10 - 32%) were obtained. Effect of continuous cooling duration on ferrite content, amount of carbon diffused in the prior austenite grains, variation of carbon content in the retained austenite (c_γ) and its volume fraction (V_γ) has been analyzed. Finally, structure property correlation has been established.

Keywords: Mixed phase steel; Retained austenite; Bainite.

*Corresponding Author: Email id – kallol@iitk.ac.in

Phone: +915122598679; Fax: +915122597505

Download English Version:

<https://daneshyari.com/en/article/7218542>

Download Persian Version:

<https://daneshyari.com/article/7218542>

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