

Author's Accepted Manuscript

An investigation on the microstructure and mechanical properties in an ultrafine lamellar martensitic steel processed by heavy warm rolling and tempering

Lifeng Lv, Liming Fu, Yanle Sun, Aidang Shan



PII: S0921-5093(18)30869-4
DOI: <https://doi.org/10.1016/j.msea.2018.06.073>
Reference: MSA36628

To appear in: *Materials Science & Engineering A*

Received date: 10 April 2018
Revised date: 6 June 2018
Accepted date: 18 June 2018

Cite this article as: Lifeng Lv, Liming Fu, Yanle Sun and Aidang Shan, An investigation on the microstructure and mechanical properties in an ultrafine lamellar martensitic steel processed by heavy warm rolling and tempering, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.06.073>

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.

An investigation on the microstructure and mechanical properties in an ultrafine lamellar martensitic steel processed by heavy warm rolling and tempering

Lifeng Lv^{a,b}, Liming Fu^{a,b,c*}, Yanle Sun^{a,b}, Aidang Shan^{a,b,c,d*}

^aSchool of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, 200240, People's Republic of China

^bCollaborative Innovation Center for Advanced Ship and Deep-Sea Exploration(CISSE), Shanghai, 200240, People's Republic of China,

^cShanghai Key Laboratory of High Temperature Materials and Precision Forming, Shanghai Jiao Tong University, Shanghai 200240, People's Republic of China

^dSchool of Environmental Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, People's Republic of China

lmfu@sjtu.edu.cn

adshan@sjtu.edu.cn

*Corresponding authors.

Abstract

An ultrafine lamellar martensitic steel was fabricated by heavy warm rolling of undercooled austenite and subsequent quenching. The martensite transformed from warm rolled austenite was composed of ultrafine heterogeneous lamellar plates, which were further subdivided into laths and twins. The warm rolled steel after low temperature tempering exhibited excellent mechanical properties with a yield strength of 2343 MPa, ultimate tensile strength of 2586 MPa and total elongation of 9.4%. The combination of ultrahigh strength and high ductility was primarily attributed to the united effect of ultrafine lamellar plates, high density dislocations, twins and retained

Download English Version:

<https://daneshyari.com/en/article/7971748>

Download Persian Version:

<https://daneshyari.com/article/7971748>

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