Effect of Grain Boundary Character Distribution on the Impact Toughness of 410NiMo Weld Metal - DTU Orbit (09/11/2017)

Effect of Grain Boundary Character Distribution on the Impact Toughness of 410NiMo Weld Metal

Grain boundary character distributions in 410NiMo weld metal were studied in the as-welded, first-stage, and second-stage postweld heat treatment (PWHT) conditions, and these were correlated with the Charpy-V impact toughness values of the material. The high impact toughness values in the weld metal in the as-welded and first-stage PWHT conditions compared to that in the second-stage condition are attributed to the higher fraction of low-energy I pound boundaries. A higher volume fraction of retained austenite and coarser martensite after second-stage PWHT accompanied by the formation of the ideal cube component in the 2-hour heat-treated specimen led to a reduction in the toughness value. A subsequent increase in the PWHT duration at 873 K (600 A degrees C) enhanced the formation of {111}aOE (c) 112 >, which impedes the adverse effect of the cubic component, resulting in an increase in the impact toughness. In addition to this, grain refinement during 4-hour PWHT in the second stage also increased the toughness of the weld metal.

General information

State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Indira Gandhi Centre for Atomic Research, National Metallurgical Laboratory
Authors: Divya, M. (Ekstern), Das, C. R. (Intern), Chowdhury, S. G. (Ekstern), Albert, S. K. (Ekstern), Bhaduri, A. K. (Ekstern)
Pages: 3397-3411
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information

Journal: Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science
Volume: 47A
Issue number: 7
ISSN (Print): 1073-5623
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.91 SJR 1.179 SNIP 1.179
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.231 SNIP 1.332 CiteScore 1.78
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.671 SNIP 1.877 CiteScore 2.06
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.481 SNIP 1.63 CiteScore 1.9
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.419 SNIP 1.706 CiteScore 1.76
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.508 SNIP 1.703 CiteScore 1.78
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.688 SNIP 1.802
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.608 SNIP 1.53
Web of Science (2009): Indexed yes

BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.505 SNIP 1.536
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.314 SNIP 1.544
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.397 SNIP 1.653
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.183 SNIP 1.414
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.078 SNIP 1.607
Scopus rating (2003): SJR 1.108 SNIP 1.699
Scopus rating (2002): SJR 2.057 SNIP 1.992
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.878 SNIP 1.784
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.844 SNIP 1.809
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 2.028 SNIP 1.905
Original language: English
DOIs:
10.1007/s11661-016-3481-z
Source: FindIt
Source-ID: 2304393363
Publication: Research - peer-review › Journal article – Annual report year: 2016