

Title (en)

STEEL MATERIAL HAVING EXCELLENT TOUGHNESS IN WELD-HEAT-AFFECTED ZONE

Title (de)

STAHL MATERIAL MIT HERVORRAGENDER ZÄHIGKEIT IN VON SCHWEISSSTITZE BETROFFENEN ZONEN

Title (fr)

MATÉRIAU EN ACIER AYANT UNE EXCELLENTE RÉSISTANCE DANS UNE ZONE AFFECTÉE D'UN SOUDAGE À CHAUD

Publication

EP 2862953 A4 20160413 (EN)

Application

EP 13806413 A 20130531

Priority

- JP 2012138047 A 20120619
- JP 2013065142 W 20130531

Abstract (en)

[origin: EP2862953A1] Provided is a steel having excellent toughness in a heat affected zone (HAZ) even upon high heat input welding with a heat input of 60 kJ/mm or higher. (a) The steel includes an oxide containing Zr, at least one rare-earth element, and Ca. (b) Of all inclusions in the steel, inclusions with an equivalent circle diameter of 0.1 to 2 μm are present in a number density of 120 or greater per square millimeter of an observation field area, and oxides with an equivalent circle diameter greater than 3 μm are present in a number density of 5.0 or less per square millimeter of an observation field area. (c) The inclusions in the steel have chemical compositions meeting a condition specified by Formula (1): $\text{Insol} \cdot \text{Ti} - 3.4 \times \text{Insol} \cdot \text{N} / \text{Insol} \cdot \text{Al} = 1.0 \text{ to } 8$

IPC 8 full level

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CPC (source: EP KR)

C21C 7/04 (2013.01 - KR); **C21C 7/06** (2013.01 - KR); **C21D 8/0226** (2013.01 - KR); **C21D 8/0263** (2013.01 - KR); **C22C 38/001** (2013.01 - EP); **C22C 38/002** (2013.01 - EP); **C22C 38/005** (2013.01 - EP); **C22C 38/02** (2013.01 - EP); **C22C 38/04** (2013.01 - EP); **C22C 38/06** (2013.01 - EP); **C22C 38/08** (2013.01 - EP KR); **C22C 38/12** (2013.01 - EP); **C22C 38/14** (2013.01 - EP KR); **C22C 38/16** (2013.01 - EP KR); **C22C 38/18** (2013.01 - EP KR); **C21D 8/0226** (2013.01 - EP); **C21D 8/0263** (2013.01 - EP)

Citation (search report)

- [X] JP 2011127220 A 20110630 - KOBE STEEL LTD
- [X] JP 2011038180 A 20110224 - KOBE STEEL LTD
- [X] JP 2008223062 A 20080925 - KOBE STEEL LTD
- [X] JP 2012092425 A 20120517 - KOBE STEEL LTD
- See references of WO 2013190975A1

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

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EP 2862953 A1 20150422; **EP 2862953 A4 20160413**; CN 104411849 A 20150311; CN 104411849 B 20161019; JP 2014001432 A 20140109; JP 5820341 B2 20151124; KR 101697845 B1 20170118; KR 20150015506 A 20150210; WO 2013190975 A1 20131227

DOCDB simple family (application)

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