

Title (en)  
STEEL PLATE EXCELLENT IN RESISTANCE OF DUCTILE CRACK INITIATION FROM WELDED HEAT-AFFECTED ZONE AND BASE MATERIAL AND MANUFACTURING METHOD THEREFOR

Title (de)  
STAHLPLATTE MIT HERVORRAGENDEM WIDERSTAND GEGEN DUKTILE RISSBILDUNG IN DER SCHWEISS-WÄRMEEINFLUSSZONE UND AUSGANGSMATERIAL UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)  
PLAQUE D'ACIER PRESENTANT D'EXCELLENTE RESISTANCE CONTRE LA FORMATION DE FISSURES DUCTILES DANS UNE ZONE AFFECTEE PAR LA CHALEUR DE SOUDURE, MATERIAU DE BASE ET PROCEDE DE FABRICATION ASSOCIES

Publication  
**EP 2383360 A1 20111102 (EN)**

Application  
**EP 09835126 A 20091225**

Priority  
• JP 2009071908 W 20091225  
• JP 2008333204 A 20081226  
• JP 2008333205 A 20081226

Abstract (en)  
This invention relates to steel materials suitable for use in welded structures, such as pipelines, bridges, and architectural structures, requiring structural safety and a method for manufacturing the same and particularly relates to improvement of resistance of ductile crack initiation from welded heat affected zone and a base material. Specifically, a steel material has a composition of C: 0.02 to 0.2%, Si: 0.01 to 0.5%, Mn: 0.5 to 2.5%, P: 0.05% or lower, S: 0.05% or lower, Al: 0.1% or lower, and N: 0.01% or lower and, as required, one or two or more elements selected from Cu: 0.01 to 2%, Ni: 0.01 to 5%, Cr: 0.01 to 3%, Mo: 0.01 to 2%, Nb: 0.1% or lower, V: 0.1% or lower, Ti: 0.1% or lower, B: 0.01% or lower, Ca: 0.01% or lower, and REM: 0.1 % or lower in terms of % by mass, and the balance Fe with inevitable impurities, in which the microstructure at the 1/4 position of the plate thickness contains ferrite and a hard phase, the area fraction of the hard phase is 50 to 90%, and the average aspect ratio of the ferrite is 1.5 or more.

IPC 8 full level  
**C22C 38/00** (2006.01); **C21D 1/25** (2006.01); **C21D 8/02** (2006.01); **C21D 9/50** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C22C 38/08** (2006.01); **C22C 38/12** (2006.01); **C22C 38/14** (2006.01); **C22C 38/16** (2006.01); **C22C 38/18** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP KR US)  
**C21D 1/25** (2013.01 - EP KR US); **C21D 8/0263** (2013.01 - EP KR US); **C22C 38/001** (2013.01 - EP KR US); **C22C 38/002** (2013.01 - EP KR US); **C22C 38/005** (2013.01 - EP KR US); **C22C 38/02** (2013.01 - EP KR US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/08** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/16** (2013.01 - EP US); **C22C 38/18** (2013.01 - EP US); **C21D 9/50** (2013.01 - EP US); **C21D 2211/002** (2013.01 - EP KR US); **C21D 2211/005** (2013.01 - EP KR US); **C21D 2211/008** (2013.01 - EP KR US)

Cited by  
CN102337478A

Designated contracting state (EPC)  
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 SE SI SK SM TR

DOCDB simple family (publication)  
**EP 2383360 A1 20111102**; **EP 2383360 A4 20170329**; **EP 2383360 B1 20190703**; CN 102264934 A 20111130; CN 105154761 A 20151216; JP 2010168657 A 20100805; JP 2014088623 A 20140515; JP 5712484 B2 20150507; JP 5729456 B2 20150603; KR 101343747 B1 20131219; KR 20110091814 A 20110812; RU 2011131056 A 20130210; RU 2493287 C2 20130920; US 2013000798 A1 20130103; WO 2010074347 A1 20100701

DOCDB simple family (application)  
**EP 09835126 A 20091225**; CN 200980152648 A 20091225; CN 201510543254 A 20091225; JP 2009071908 W 20091225; JP 2009295613 A 20091225; JP 2013257643 A 20131213; KR 20117015996 A 20091225; RU 2011131056 A 20091225; US 200913141373 A 20091225