Title (en)

PROCESS FOR PRODUCING HIGH-STRENGTH COLD ROLLED STEEL SHEET WITH LOW YIELD STRENGTH AND WITH LESS MATERIAL QUALITY FLUCTUATION

Title (de)

VERFAHREN ZUR HERSTELLUNG EINES HOCHFESTEN KALTGEWALZTEN STAHLBLECHS MIT NIEDRIGER STRECKFESTIGKEIT UND GERINGERER MATERIALQUALITÄTSSCHWANKUNG

Title (fr)

PROCÉDÉ POUR PRODUIRE UNE TÔLE D'ACIER LAMINÉE À FROID DE HAUTE RÉSISTANCE AVEC UNE FAIBLE LIMITE D'ÉLASTICITÉ ET AVEC MOINS DE FLUCTUATIONS DE QUALITÉ DE MATÉRIAU

Publication

EP 2169083 B1 20180314 (EN)

Application

EP 08778224 A 20080710

Priority

- JP 2008062873 W 20080710
- JP 2007181947 A 20070711

Abstract (en)

[origin: EP2169083A1] The present invention provides a method for producing a high-strength cold-rolled steel sheet with low YP and excellent uniformity. A method for producing a high-strength cold-rolled steel sheet includes hot-rolling and cold-rolling steel having a composition which contains, by % by mass, over 0.01% to less than 0.08% of C, 0.2% or less of Si, 0.8% to less than 1.7% of Mn, 0.03% or less of P, 0.02% or less of S, 0.3% or less of sol. Al, 0.01% or less of N, and over 0.4% to 2% of Cr, and which satisfies 1.9 < [Mneq] < 3 and 0.34 #¤ [%Cr]/[%Mn], the balance being composed of iron and inevitable impurities; heating at an average heating rate of less than 3 °C/sec in a temperature range of 680°C to 740°C; annealing at an annealing temperature of over 740°C to less than 820°C; cooling at an average cooling rate of 2 to 30 °C/sec in a temperature range of the annealing temperature to 650°C; cooling at an average cooling rate of 10 °C/sec or more in the temperature range of 650°C to Tc°C represented by equation (1) below; and cooling at an average cooling rate of 0.2 to 10 °C/sec in the temperature range of Tc°C to 200°C. Tc = 410 - 40 × [%Mn] - 30 × [%Cr] ... (1) wherein [Mneq] represents the Mn equivalent shown by [Mneq] = [%Mn] + 1.3 × [%Cr] and [%Mn] and [%Cr] represent the contents of Mn and Cr, respectively.

IPC 8 full level

C21D 8/02 (2006.01); **C21D 1/18** (2006.01); **C21D 1/26** (2006.01); **C21D 8/04** (2006.01); **C21D 9/46** (2006.01); **C21D 9/48** (2006.01); **C22C 38/04** (2006.01); **C22C 38/18** (2006.01)

CPC (source: EP KR US)

C21D 1/18 (2013.01 - KR); **C21D 1/185** (2013.01 - EP US); **C21D 1/26** (2013.01 - EP US); **C21D 8/0226** (2013.01 - KR); **C21D 8/0236** (2013.01 - KR); **C21D 8/0247** (2013.01 - EP US); **C21D 8/0273** (2013.01 - KR); **C21D 8/0447** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP US); **C21D 9/48** (2013.01 - EP US); **C22C 38/001** (2013.01 - KR); **C22C 38/02** (2013.01 - KR); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - KR); **C22C 38/18** (2013.01 - EP US); **C22C 38/38** (2013.01 - KR); C21D 2211/004 (2013.01 - EP KR US)

Cited by

WO2020121088A1; WO2020121034A1

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 MT NL NO PL PT RO SE SI SK TR

DOCDB simple family (publication)

EP 2169083 A1 20100331; **EP 2169083 A4 20150520**; **EP 2169083 B1 20180314**; CA 2693787 A1 20090115; CA 2693787 C 20120207; CN 101688265 A 20100331; CN 101688265 B 20110622; JP 2009035816 A 20090219; JP 5272548 B2 20130828; KR 101164471 B1 20120718; KR 20100027209 A 20100310; US 2010326572 A1 20101230; WO 2009008548 A1 20090115

DOCDB simple family (application)

EP 08778224 A 20080710; CA 2693787 A 20080710; CN 200880023784 A 20080710; JP 2008062873 W 20080710; JP 2008177468 A 20080708; KR 20107000377 A 20080710; US 66805708 A 20080710