

## Title (en)

Method of producing steel sheets having high strength, ductility and toughness and thus produced sheets.

## Title (de)

Herstellungsverfahren von Stahlblechen mit hoher Festigkeit, Duktilität sowie Zähigkeit und so hergestellte Bleche.

## Title (fr)

Procédé de fabrication de tôles d'acier à très hautes caractéristiques de résistance, de ductilité et de tenacité, et tôles ainsi produites

## Publication

**EP 1832667 A1 20070912 (FR)**

## Application

**EP 06290386 A 20060307**

## Priority

EP 06290386 A 20060307

## Abstract (en)

Hot rolled steel sheet comprises (in %): carbon (0.1-0.25); manganese (1-3); aluminum ( $\geq 0.015$ ); silicon (1.985); molybdenum (= 0.3); chromium (= 1.5); sulfur (= 0.015); phosphorus (= 0.1); cobalt (= 1.5); boron (= 0.005); and iron and impurities (rest), where the sum of silicon and aluminum is 1-2 and the sum of chromium and molybdenum is greater than 0.3. The sheet has a strength of greater than 1200 MPa and a Re/Rm ratio of 0.75 (where Re is an elastic limit of the steel, and Rm is mechanical resistance of the steel) with elongation at rupture of greater than 25%. An independent claim is included for a process of manufacturing the steel comprising supplying the steel composition, casting the steel composition, heating the steel composition at greater than 1150[deg]C, hot rolling the semi-finished product until the microstructure of steel is entirely austenite in nature, cooling the obtained stainless steel at a temperature greater than the austenite transformation temperature i.e. at a cooling speed of 50-90[deg]C/second, a bainite transformation temperature or at Ms+50[deg]C, (where Ms is a transformation temperature of martensite) and cooling the stainless steel at a cooling speed of 0.08-600[deg]C/minute until the ambient temperature is reached, where the bainite transformation temperature is 0.08-2[deg]C/minute or is Bs+60[deg]C, when the speed is greater than 2-600[deg]C/minute.

## Abstract (fr)

L'invention concerne une tôle d'acier laminée à chaud de résistance supérieure à 1200 MPa, de rapport Re/Rm inférieur à 0,75, d'allongement à rupture supérieur à 10%, dont la composition comprend, les teneurs étant exprimées en poids: 0,10% # C # 0,25%, 1%# Mn # 3%, Al #¥ 0,015 %, Si#1,985%, Mo # 0,30%, Cr # 1,5%, S # 0,015%, P# 0,1%, B # 0,005%, étant entendu que 1% #Si+Al #2%, Cr+(3 x Mo) #¥0,3%, le reste de la composition étant constitué de fer et d'impuretés inévitables résultant de l'élaboration, la microstructure de l'acier étant constituée d'au moins 75% de bainite, d'austénite résiduelle en quantité supérieure ou égale à 5%, et de martensite en quantité supérieure ou égale à 2%

## IPC 8 full level

**C22C 38/02** (2006.01); **C21D 1/19** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C22C 38/34** (2006.01); **C22C 38/38** (2006.01)

## CPC (source: EP KR US)

**C21D 1/19** (2013.01 - EP US); **C21D 8/02** (2013.01 - EP KR US); **C21D 9/32** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/22** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP US); **C22C 38/38** (2013.01 - EP US); **C21D 221/002** (2013.01 - EP US); **C21D 221/008** (2013.01 - EP US)

## Citation (applicant)

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WO2020079096A1; EP2235227A4

## Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

## Designated extension state (EPC)

AL BA HR MK YU

## DOCDB simple family (publication)

**EP 1832667 A1 20070912**; AT E455875 T1 20100215; BR PI0708649 A2 20110607; BR PI0708649 B1 20150929; CA 2645059 A1 20070913; CA 2645059 C 20120424; CN 101437975 A 20090520; CN 101437975 B 20110601; DE 602007004454 D1 20100311; EP 1994192 A1 20081126; EP 1994192 B1 20100120; ES 2339292 T3 20100518; JP 2009529098 A 20090813; JP 5055300 B2 20121024; KR 101073425 B1 20111017; KR 20080106337 A 20081204; MA 30261 B1 20090302; MX 2008011274 A 20080912; PL 1994192 T3 20100630; RU 2008139605 A 20100420; RU 2397268 C2 20100820; UA 92075 C2 20100927; US 10370746 B2 20190806; US 2009107588 A1 20090430; US 2018010220 A1 20180111; US 9856548 B2 20180102; WO 2007101921 A1 20070913; ZA 200807519 B 20090527

## DOCDB simple family (application)

**EP 06290386 A 20060307**; AT 07730968 T 20070214; BR PI0708649 A 20070214; CA 2645059 A 20070214; CN 200780015901 A 20070214; DE 602007004454 T 20070214; EP 07730968 A 20070214; ES 07730968 T 20070214; FR 2007000256 W 20070214; JP 2008557785 A 20070214; KR 200807024511 A 20070214; MA 31209 A 20080905; MX 2008011274 A 20070214; PL 07730968 T 20070214; RU 2008139605 A 20070214; UA A200811832 A 20070214; US 201715711335 A 20170921; US 28183907 A 20070214; ZA 200807519 A 20080828