

[SS 1] steel and (slab or plate or sheet) and cool+ and temperature and roll+ and melt

Results in EPODOC 94

[SS 2] 1 and hot and heat+ and room

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[SS 3] ..li



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[C21D8/0284](#) ; [C23C2/02](#) ; [C23C2/06](#) ; [C23C2/40](#) ; [C21D9/52](#) ; [C22C18/00](#) ; [C22C18/04](#) ;
[C22C38/00](#) ; [C22C38/002](#) ; [C22C38/02](#) ; [C22C38/04](#) ; [C22C38/06](#) ; [C22C38/12](#) ;
[C22C38/14](#)
- CCA - [C21D2211/002](#)
- PA - SALZGITTER FLACHSTAHL GMBH [DE]
- TI - METHOD OF PRODUCING A **HOT** STRIP OF A BAINITIC MULTI-PHASE **STEEL** HAVING A ZN-MG-AL COATING, AND A CORRESPONDING **HOT** STRIP
- AB - The invention relates to a method for producing a **hot-rolled** strip composed of a bainitic multi-phase **steel** and having a Zn—Mg—Al coating, comprising the following steps: melting a **steel melt** containing (in weight percent): C: 0.04-0.11, Si: ≤0.7, Mn: 1.4-2.2, Mo: 0.05-0.5, Al: 0.015-0.1, P: up to 0.02, S: up to 0.01, B: up to 0.006, and at least one element from the group Nb, V, Ti in accordance with the following condition: 0.02 ≤ Nb+V+Ti ≤ 0.20, the remainder being iron including unavoidable **steel**-accompanying elements resulting from the melting process, casting the **steel melt** into a preliminary material, in particular a **slab** or a block or a thin **slab**, **hot rolling** the preliminary material into a **hot-rolled** strip having a final **rolling temperature** in the range of 800 to 950° C., **cooling** the **hot-rolled** strip to a winding **temperature** less than 650° C., winding the **hot-rolled** strip at a winding **temperature** less than 650° C., **cooling** the wound **hot-rolled** strip to **room temperature** in still air, wherein the microstructure of the wound **hot-rolled** strip then has a bainite fraction greater than 50% after the **hot rolling**, **heating** the **hot-rolled** strip to a **temperature** greater than 650° C. and less than Ac₃, in particular less than Ac₁+50° C., **cooling** the **hot-rolled** strip to zinc bath **temperature**, **hot-dip coating** the **heated hot-rolled** strip in a zinc alloy molten bath containing (in weight percent): Al: 1.0-2.0, Mg: 1.0-2.0, the remainder being zinc and unavoidable impurities. The invention further relates to the **hot-rolled** strip produced in accordance with the method above and to shaped, dynamically highly loadable components, in particular motor vehicle parts, that are produced from said **hot-rolled** strip and that are resistant to corrosive and abrasive influences.

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[EP2020451](#) A1 20090204 [Y] (ARCELORMITTAL FRANCE [FR])
[Y] 1-14
* abstract *
* paragraph [0001] - paragraph [0002] *
* paragraph [0009] - paragraph [0015] *
* paragraph [0063] - paragraph [0064] *;
[EP1621645](#) A1 20060201 [Y] (CORUS STAAL BV [NL])
[Y] 1-14
* abstract *
* examples 7, 11; table 2 *;
[JP2003321739](#) A 20031114 [Y] (JFE STEEL KK)
[Y] 1-14
* the whole document *;
[EP2703515](#) A1 20140305 [YA] (VOESTALPINE STAHL GMBH [AT])
[Y] 1-6,8-14
* abstract *
[A] 7
- CCI - [B32B15/013](#) ; [C21D6/005](#) ; [C21D6/008](#) ; [C21D8/0205](#) ; [C21D8/0226](#) ; [C21D8/0263](#) ;
[C21D8/0284](#) ; [C23C2/02](#) ; [C23C2/06](#) ; [C23C2/40](#) ; [C21D9/52](#) ; [C22C18/00](#) ; [C22C18/04](#) ;
[C22C38/00](#) ; [C22C38/002](#) ; [C22C38/02](#) ; [C22C38/04](#) ; [C22C38/06](#) ; [C22C38/12](#) ;
[C22C38/14](#)
- CCA - [C21D2211/002](#)
- PA - SALZGITTER FLACHSTAHLGMBH [DE]
- TI - METHOD FOR PRODUCING A **HOT-ROLLED** STRIP COMPOSED OF A BAINITIC MULTI-PHASE **STEEL** AND HAVING A ZN-MG-AL COATING, AND CORRESPONDING **HOT-ROLLED** STRIP
- AB - The invention relates to a method for producing a **hot-rolled** strip composed of a bainitic multi-phase **steel** and having a Zn-Mg-Al coating, comprising the following steps: melting a **steel melt** containing (in weight percent): C: 0.04 - 0.11, Si: ≤ 0.7, Mn: 1.4 - 2.2, Mo: 0.05 - 0.5, Al: 0.015 - 0.1, P: up to 0.02, S: up to 0.01, B: up to 0.006, and at least one element from the group Nb, V, Ti in accordance with the following condition: $0.02 \leq Nb + V + Ti \leq 0.20$, the remainder being iron including unavoidable **steel**-accompanying elements resulting from the melting process, casting the **steel melt** into a preliminary material, in particular **slab** or a block or a thin **slab**, **hot rolling** the preliminary material into a **hot-rolled** strip having a final **rolling temperature** in the range of 800 to 950 °C, **cooling** the **hot-rolled** strip to a winding **temperature** less than 650 °C, winding the **hot-rolled** strip at a winding **temperature** less than 650 °C, **cooling** the wound **hot-rolled** strip to **room temperature** in still air, wherein the microstructure of the wound **hot-rolled** strip then has a bainite fraction greater than 50% after the **hot rolling**, **heating** the **hot-rolled** strip to a **temperature** greater than 650 °C and less than

Ac3, in particular less than Ac1 + 50 °C, **cooling** the **hot-rolled** strip to zinc bath **temperature**, **hot-dip** coating the **heated hot-rolled** strip in a zinc alloy molten bath containing (in weight percent): Al: 1.0 - 2.0, Mg: 1.0 - 2.0, the remainder being zinc and unavoidable impurities. The invention further relates to the **hot-rolled** strip produced in accordance with the method above and to shaped, dynamically highly loadable components, in particular motor vehicle parts, that are produced from said **hot-rolled** strip and that are resistant to corrosive and abrasive influences.

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- DT - *; Rep
- CT - || STSE (A1)
[EP2258886](#) A1 20101208 [I] (JFE STEEL CORP [JP])
 [I] 1-3
 * examples 13 - E; tables 1-3 *;
[EP2182080](#) A1 20100505 [I] (KOBE STEEL LTD [JP])
 [I] 1-3
 * example 14; tables 1,2 *
- CCI - [C21D8/0226](#) ; [C21D8/0236](#) ; [C21D8/0263](#) ; [C21D8/0273](#) ; [C21D8/0284](#) ; [C21D9/46](#) ;
[C22C38/001](#) ; [C22C38/002](#) ; [C22C38/02](#) ; [C22C38/06](#) ; [C22C38/28](#) ; [C22C38/38](#)
- CQI - [C22C38/04](#)
- CCA - [C21D2211/001](#) ; [C21D2211/002](#) ; [C21D2211/005](#) ; [C21D2211/008](#) ; [C21D2211/009](#)
- PA - (A1 B1)
 THYSSENKRUPP STEEL EUROPE AG [DE]
- TI - (A1 B1)
 Cold **rolled steel** flat product and method for its production
- AB - (A1)
 Cold reduced flat **steel** product comprises perlite and bainite structure comprising 20-40 vol.% of martensite, 2-15 vol.% of retained austenite and residual ferrite. The flat **steel** product is made of a **steel** consisting of 0.12-0.19 wt.% of carbon, 1.5-2.5 wt.% of manganese, 0.60-1 wt.% of silicon, = 0.1 wt. of aluminum, 0.2-0.6 wt.% of chromium, 0.05-0.15 wt.% of titanium, and remaining iron and unavoidable impurities, and has an elongation at rupture (A80) of 15%, a tensile strength of at least 880 MPa, a yield strength of at least 550 MPa, and hole expansion ratio of more than 6%. An independent claim is included for producing the cold **rolled** flat **steel** product comprising Casting a **steel melt** containing of carbon, manganese, silicon, aluminum, chromium, titanium and remaining iron and unavoidable impurities to form an intermediate in which there is a **slab** or thin **slab**, **heating** the intermediate at an austenitizing **temperature** of 1100-1300[deg] C, **hot rolling** the **heated** intermediate to form a **hot** strip at a **temperature** of 850-960[deg] C, **cooling** the **hot** strip at a coiling **temperature** of 500-650[deg] C, **rolling** the **cooled** strip using a **roller**, optionally pickling the **hot-rolled** strip, cold **rolling** the **hot-rolled** strip into a cold **rolled** flat **steel** product having cold **rolling** ratio of at least 30%, continuously annealing the cold **rolled steel** flat product at a **temperature**

of 750-900[deg] C for 80-300 seconds, and then **cooling** in two stages, aging the flat **steel** product at an aging **temperature** of 100-400[deg] C for 210-710 seconds, **cooling** the flat product to **room temperature**, temper- **rolling** the flat **steel** product with a **roll** of 0.2-2%, and optional coating the flat **steel** product with a metallic protective layer, where the step of **cooling** the cold-**rolled steel** flat product includes in the first stage, **cooling** the product with a **cooling** rate of 8-100[deg] C/sec to a **temperature** of 450-550[deg] C and in the second stage, **cooling** from the intermediate **temperature** at a **cooling** rate of 2-100[deg] K/second to a **temperature** of 350-450[deg] C.

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PR - CN20111265205 20110908

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DT - I

CT - || STSE (A)

[CN101928876](#) A 20101229 [A] (ANGANG STEEL CO LTD)

[A] 1-10

* 全文 *;

[CN101235464](#) A 20080806 [A] (UNIV BEIJING SCIENCE & TECH [CN])

[A] 1-10

* 全文 *;

[WO2010054813](#) A1 20100520 [A] (VOESTALPINE STAHL GMBH [AT], et al)

[A] 1-10

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[DE102008005806](#) A1 20090910 [A] (UNIV FREIBERG TECH BERGAKAD [DE])

[A] 1-10

* 全文 *

PA - (B)

UNIV SHANGHAI JIAOTONG

TI - (B)

Ultrahigh-strength high-plasticity low-carbon phase change and twin crystal induced plastic **hot rolled steel plate** and preparation method thereof

AB - (A)

The invention relates to an ultrahigh-strength high-plasticity low-carbon phase change and twin crystal induced plastic **hot rolled steel plate**. The **hot rolled steel plate** contains the following components in percentage by mass: less than or equal to 0.10 percent of C, 13.6 to 20.0 percent of Mn, 1.5 to 3.0 percent of Si, 0.05 to 0.25 percent of Nb, less than or equal to 0.008 percent of P, less than or equal to 0.005 percent of S, and the balance of Fe and inevitable impurities, wherein when C is less than or equal to 0.05 percent and Mn is less than or equal to 16.0 percent, the **hot rolled steel plate** also contains 0.02 to 0.082 percent of N and 0.045 to 0.10 percent of Ti. A preparation method comprises the following steps of: smelting the components, performing secondary refining in a vacuum furnace, casting the ~~molten~~ melt to form a casting blank, **heating** the casting blank to the **temperature** of between 1,150 and 1,200 DEG C, preserving the **heat** for 1 to 2 hours, removing scales by using high-pressure water

performing **hot rolling** at the **temperature** of between 1,100 and 1,150 DEG C, and performing rough **rolling** and precision**rolling**, wherein the accumulated deformation of more than 1,000 DEG C is more than 50 percent; and performing final**rolling** at the **temperature** of between 820 and 880 DEG C, performing **temperature** holding or relaxation treatment for several times before final**rolling** water entry or after precision **rolling**, **cooling** the **steel plate** to the **temperature** of between 350 and 550 DEG C at the velocity of 15 to 50 DEG C per second after **rolling**, and then **cooling** the **steel plate** in the air to **room temperature** . Compared with the prior art, the tensile strength of the prepared **hot rolled plate** is not less than 1,220Mpa, and the elongation of the **hot rolled plate** is not less than 52 percent.

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PA - NIPPON STEEL CORP

TI - MANUFACTURE OF ZINC COATING **STEEL SHEET**

AB - PURPOSE:To make unnecessary electroplating in two times and dip plating after **hot melt**, and make it favorable costwise, by a method wherein zinc foil or zinc alloy foil is laminated on the surface of a **steel** belt through a thermoplastic resin utilizing the remaining **heat** of a cold-**rolled steel sheet** after annealing. CONSTITUTION:A cold-**rolled steel sheet**, cold-**rolled** in a continuous annealing facility by a normal method, is guided continuously into a **heating** furnace through processes of degreasing, water washing and drying. The **steel** belt 1 receives **heat** treatment in a reducing atmosphere until the **temperature** thereof arrives at a predetermined **temperature** and subsequently is guided to a secondary **cooling** chamber 10 after primary **cooling** and averaging treatment. The **steel** belt 1, **cooled** to a predetermined **temperature** , is guided to the outside of a **room** through seal **rolls** 17 provided below the secondary **cooling** chamber, thereafter, the hoops 18, 19 of zinc foil or zinc alloy foil, lined with thermoplastic resin films on the surface thereof opposing too the **steel** belt, are supplied to one side or both sides of the **steel** belt to press them by pressing **rolls** 20, 21 and laminate the foils on the surface of the **steel** belt. The thermoplastic resin, employed for the bonding of the foils, is preferably a soft thermoplastic resin such as acryl series, polyester series, polyolefin series, polyamide series or the like.