



New connection on: : 20-03-2018 : 22:34:06 - Last disconnection on: : 20-03-2018 : 17:39:02

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

[EPODOC: SS 9] steel and coil+ and pick+ and roll+

Results in EPODOC **1.503**

[SS 10] 9 and temperature and Nb

Results in EPODOC **113**

[SS 11] 11 and hot+ and cold

Non-existent or invalid SS number(s).

- Check with the command `..HI.` When searching for numbers, use quotes e.g. `"4" W WHEEL?` *ERROR (-100803)*

[SS 11] 10 and hot+ and cold

Results in EPODOC **96**

[SS 12] 11 and Mn

Results in EPODOC **94**

[SS 13] 12 and (yield or YP)

Results in EPODOC **12**

[SS 14] ..li



1/12 © EPODOC / EPO

PN - [CN107267875](#) A 20171020

PR - CN20171397656 20170531

AP - CN20171397656 20170531

DT - I

PA - WUHAN IRON & STEEL CO LTD

- TI - Weathering **steel** with **yield** strength being greater than or equal to 700MPa for railway container and production method of weathering **steel**
- AB - The invention discloses weathering **steel** with the **yield** strength being greater than or equal to 700MPa for a railway container. The weathering **steel** comprises the following components, by weight, 0.13-0.16% of C, 0.50-0.60% of Si, 1.10-1.20% of **Mn**, less than or equal to 0.015% of P, less than or equal to 0.010% of S, 0.20-0.30% of Cu, 0.30-0.50% of Cr, 0.025-0.040% of **Nb**, 0.072-0.108% of Ti, 0.010-0.020% of V, less than or equal to 0.007% of N. A production method of the weathering **steel** comprises the following steps: smelting, continuous casting for forming a blank and heating are carried out; rough **rolling** is carried out; finish **rolling** is carried out; conventional laminar cooling to the **coiling temperature** is carried out; **coiling** is carried out; after a **steel coil** is cooled to the room **temperature**, acid **pickling** is carried out; **cold rolling** is carried out; cover annealing is carried out; cooling is carried out; and leveling is carried out. By using **Nb** and Ti composite microalloying, and with the combination of **hot rolling** and **cold rolling** and an annealing technology, the **yield** strength is greater than or equal to 700MPa, the tensile strength is greater than or equal to 800MPa, the elongation percentage A is greater than or equal to 10%, the **cold** bending performance and the corrosion resistance are excellent, and the performance is stable.

2/12 © EPODOC / EPO

- PN - [CN106756547](#) A 20170531
- PR - CN201611139263 20161212
- AP - CN201611139263 20161212
- DT - I
- CT - || STSE (A)
[CN104911476](#) A 20150916 [A] (PANZHIHUA IRON & STEEL RES)
 [A] 1-6
 * 全文 *;
[CN105274432](#) A 20160127 [X] (ANGANG STEEL CO LTD)
 [X] 1-4
 * 权利要求1, 说明书第5-6页、表4 *;
[CN105543674](#) A 20160504 [X] (UNIV NORTHEASTERN)
 [X] 1-6
 * 权利要求1-4, 说明书第13、25段 *
- CTNP - || STSE (A)
 [A] - 中国金属学会, 《2003中国钢铁年会论文集 第4卷》, (20031031)
 [A] 1-6
 * 684-688 *
 [A] - 中国金属学会等, 《2009年汽车用钢生产及应用技术国际研讨会论文集》, (20090831)
 [A] 1-6
 * 243-244 *
 [A] - 汽车轻量化技术创新战略联盟, 《2012中国汽车轻量化技术研讨会论文集》, (20120930)
 [A] 1-6
 * 243-247 *
 [A] - 夏翠莉等, 《冷轧带钢生产》, (20111031)

[A] 1-6

* 201-203 *

[A] - 康永林,《现代汽车板工艺及成形理论与技术》,(20090228)

[A] 1-6

* 237-242 *

- CNOI - [C21D8/0226](#) ; [C21D8/0236](#) ; [C21D8/0273](#) ; [C22C38/02](#) ; [C22C38/04](#) ; [C22C38/12](#) ; [C22C38/14](#)
- CNOA - [C21D2211/003](#) ; [C21D2211/005](#) ; [C21D2211/009](#)
- PA - UNIVNORTHEASTERN
- TI - **Cold-rolled steel** plate with **yield** strength of 500MPa and preparation method thereof
- AB - The invention provides a **cold-rolled steel** plate with **yield** strength of 500MPa and a preparation method thereof, and belongs to the technical field of metallurgy. The **steel** plate components, by mass, are: 0.06-0.09% of C, 0-0.2% of Si, 0.8-1.0% of **Mn**, 0.03-0.05% of Ti, 0.02-0.04% of **Nb**, and the balance Fe and inevitable impurity elements. The preparation method comprises the following steps: 1) according to the chemical composition ratio of the **cold-rolled steel** plate, smelting into a casting billet; 2) performing thermal insulating on the casting billet, performing **hot rolling** to obtain a **hot-rolled** plate, cooling the **hot-rolled** plate to an appropriate **temperature** at a certain cooling rate and then **coiling** the **hot-rolled** plate; 3) after **pickling** the **coiled hot-rolled** plate, performing **cold rolling** to obtain a **cold-rolled** plate; and 4) performing continuous annealing treatment on the **cold-rolled** plate with segmented heating and segmented cooling. According to the **cold-rolled steel** plate, the microstructure mainly includes ferrite, pearlite and cementite, the **yield** strength is 530-560MPa, the tensile strength is 580-615MPa, elongation rate A80 is 21.3-22.5%, and the **yield** ratio is greater than or equal to 0.90.

3/12 © EPODOC / EPO

- PN - [CN106636898](#) A 20170510
- PR - CN201611138928 20161212
- AP - CN201611138928 20161212
- DT - I
- CT - || STSE (A)
[CN1904115](#) A 20070131 [X] (WUHAN IRON & STEEL GROUP CORP [CN])
[X] 1-6
* 权利要求1-7, 表2 *;
[CN102199726](#) A 20110928 [X] (MAANSHAN IRON & STEEL CO LTD)
[X] 1-6
* 权利要求1-3, 说明书第51段 *;
[CN103352166](#) A 20131016 [X] (MAGANG GROUP HOLDING CO LTD, et al)
[X] 1-6
* 权利要求1-5, 说明书最后1段 *
- CNOI - [C21D8/0226](#) ; [C21D8/0236](#) ; [C21D8/0273](#) ; [C21D1/26](#) ; [C22C38/02](#) ; [C22C38/04](#) ; [C22C38/12](#) ; [C22C38/14](#)
- CNOA - [C21D2211/003](#) ; [C21D2211/005](#) ; [C21D2211/009](#)
- PA - UNIVNORTHEASTERN
- TI - **Cold-rolled steel** sheet with 420 MPa grade **yield** strength and preparation method

of **steel** sheet

- AB - The invention discloses a **cold-rolled steel** sheet with the 420 MPa grade **yield** strength and a preparation method of the **steel** sheet and belongs to the technical field of metallurgy. The **steel** sheet is prepared from components in percentage by mass as follows: 0.06%-0.09% of C, 0-0.2% of Si, 0.8%-1.0% of **Mn**, 0-0.02% of Ti, 0.01%-0.025% of **Nb** and the balance of Fe and inevitable impurity elements. The preparation method comprises steps as follows: (1) according to the ratio of the chemical components of the **cold-rolled steel** sheet, a **steel** ingot is obtained through smelting and is forged to form a slab; (2) heat preservation is performed on the slab, **hot rolling** is performed, and a **hot-rolled** sheet is prepared and is cooled to the proper **temperature** at a certain cooling rate for **coiling**; (3) the **coiled hot-rolled** sheet is **pickled** and then **cold-rolled**, and the **cold-rolled** sheet is prepared; (4) the **cold-rolled** sheet is subjected to continuous annealing treatment of low-**temperature** soaking and step cooling. According to the **cold-rolled steel** sheet, the microstructure mainly comprises ferrite, pearlite and cementite, the **yield** strength of the **steel** sheet ranges from 435 MPa to 450 MPa, the tensile strength ranges from 518 MPa to 548 MPa, and the ductility A80 ranges from 25.0% to 26.3%.

4/12 © EPODOC / EPO

- PN - [US2016362761](#) A1 20161215
- PR - JP20140033851 20140225; WO2015JP00684 20150213
- AP - US201515121540 20150213
- DT - *; Rep
- CCI - [C21D8/0226](#) ; [C21D8/0236](#) ; [C21D8/0263](#) ; [C21D8/0468](#) ; [C21D8/0473](#) ; [C21D9/46](#) ; [C22C38/001](#) ; [C22C38/002](#) ; [C22C38/004](#) ; [C22C38/02](#) ; [C22C38/04](#) ; [C22C38/06](#) ; [C22C38/12](#)
- CUI - [B65D41/12](#) ; [C23G1/00](#)
- CCA - [C21D2211/005](#)
- PA - JFE STEEL CORP [JP]
- TI - **STEEL SHEET FOR CROWN CAP, METHOD FOR MANUFACTURING SAME, AND CROWN CAP**
- AB - A **steel** sheet for crown caps includes C: 0.0005 to 0.0050%, Si: 0.020% or less, **Mn**: 0.10 to 0.60%, P: 0.020% or less, S: 0.020% or less, Al: 0.01 to 0.10%, N: 0.0050% or less, **Nb**: 0.010 to 0.050%, and Fe and inevitable impurities. The **steel** sheet has an average r value of 1.30 or more and a **YP** of 450 MPa or more and 650 MPa or less. The **steel** sheet is obtained by **hot rolling** a **steel** slab at a slab reheating **temperature** of 1,150° C. or higher and a finishing **temperature** of 870° C. or higher; **coiling** the **hot rolled steel** sheet at a **coiling temperature** of 600° C. or higher, performing **pickling**; then-performing primary **cold rolling**; performing annealing at an annealing **temperature** of recrystallization **temperature** or more and 790° ° C. or less; and performing secondary **cold rolling** at a **rolling** reduction of 10% or more and 50% or less.

5/12 © EPODOC / EPO

- PN - [KR20140055468](#) A 20140509
- PNFP - KR101467056B B1 20141201
- PR - KR20120122430 20121031

AP - KR20120122430 20121031

DT - I

CT - || STSE (B1)
[KR20090049609](#) A 20090518 [] (NIPPON STEEL CORP [JP])
[KR20040049004](#) A 20040610 []

CNOI - (A)
[C21D8/0426](#) ; [C21D8/0436](#) ; [C21D8/0473](#) ; [C21D1/18](#) ; [C22C38/002](#) ; [C22C38/004](#) ;
[C22C38/02](#) ; [C22C38/04](#) ; [C22C38/12](#) ; [C22C38/14](#)

PA - (A)
HYUNDAI STEEL CO [KR]

TI - (A B1)
COLD-ROLLED STEEL SHEET FOR ENAMEL AND METHOD OF MANUFACTURING THE SAME

AB - (A)
Disclosed are a **cold-rolled steel** sheet for enamel satisfying a tensile strength (TS) of 310 to 325 MPa, a **yield point (YP)** of 245 to 265, and an elongation (EL) of 42 to 45% by controlling an alloying element and a process condition, and a method for manufacturing the **cold-rolled steel** sheet for enamel. According to the present invention, the method for manufacturing the **cold-rolled steel** sheet for enamel includes: a step (a) of **hot** finished-**rolling** a slab sheet at finishing delivery **temperature** (FDT) of 900 to 950[deg.]C, wherein the slab sheet consists of 0.0022 to 0.0030 wt% of carbon (C), 0.020 to 0.026 wt% of silicon (Si), 1.3 to 1.5 wt% of manganese (**Mn**), 0.02 wt% or less of phosphorous (P), 0.02 wt% or less of sulfur (S), : 0.02 to 0.04 wt% of titanium (Ti), 0.02 to 0.04 wt% of niobium (**Nb**), 0.001 to 0.010 wt% of calcium (Ca), 0.01 wt% or less of aluminum (Al), 0.005 wt% or less of nitrogen (N), 0.005 wt% or less of oxygen (O), remainder iron (Fe) and inevitable impurities; a step (b) of winding the **hot-rolled** sheet after cooling the **hot-rolled** sheet up to a **coiling temperature** (CT) of 660 to 740[deg.]C; a step (c) of uncoiling and temper-**rolling** the wound sheet; a step (d) of **cold-rolling** the temper-**rolled** sheet after acid-**pickling** the temper-**rolled** sheet; and a step (e) of annealing the **cold-rolled** sheet at 600 to 700[deg.]C for 10 to 20 hours.

6/12 © EPODOC / EPO

PN - [KR20130046935](#) A 20130508

PNFP - KR101344549B B1 20131226

PR - KR20110111616 20111028

AP - KR20110111616 20111028

DT - I

CNOI - (A)
[C21D8/0426](#) ; [C21D8/0436](#) ; [C21D8/0463](#) ; [C21D8/0473](#) ; [C22C38/001](#) ; [C22C38/004](#) ;
[C22C38/02](#) ; [C22C38/04](#) ; [C22C38/06](#) ; [C22C38/12](#) ; [C22C38/14](#)

PA - (A)
HYUNDAI STEEL CO [KR]

TI - (A B1)
COLD-ROLLED STEEL SHEET AND METHOD OF MANUFACTURING THE COLD-ROLLED STEEL SHEET

AB - (A)

PURPOSE: A **cold-rolled steel** plate and a manufacturing method thereof are provided to improve the strain aging resistance and **yield** point elongation in a temper-**rolling** process by improving the operation-dislocation density inside a **steel** plate, thereby stably obtaining a high bake-hardening property without degrading the surface and quality. CONSTITUTION: A method for manufacturing a **cold-rolled steel** comprises: a slab reheating step(S110) for reheating a slab **steel** plate comprising 0.0005-0.0050 wt% of C, 0.02-0.10 wt% of Si, 0.1-1.0 wt% of **Mn**, 0.01-0.10 wt% of P, 0.001-0.040 wt% of S, 0.01-0.06 wt% of Al, 0.005-0.015 wt% of **Nb**, 0.01-0.10 wt% of Ti, 0.005 wt% or less of N, and the rest of Fe and unavoidable impurities; a **hot-rolling** step(S120) for **hot-rolling** the reheated slab **steel** plate at an FDT(Finishing Delivery **Temperature**) of 890-930 [deg.]C; a cooling/ **coiling** step(S130) for **coiling** the **hot-rolled** slab **steel** plate after cooling the same at a CT(**Coiling Temperature**) of 580-750[deg.]C; a **cold-rolling** step (S150) for **rolling** the **pickling**-processed slab **steel** plate at a reduction ratio of 70-80%; an annealing heat step(S160) for annealing the **cold-rolled** slab **steel** plate; and a temper-**rolling** step(S170) temper-**rolling** the annealed slab using the upper and lower **rolls** having different diameters. [Reference numerals] (AA) Start; (BB) Slab reheating(SRT: 1150-1250[deg.]C); (S110) **Hot-rolling**(FDT: 890-930[deg.]C); (S120) Cooling/ **coiling**(CT: 580-750[deg.]C); (S130) **Pickling**; (S140) **Cold-rolling**(Reduction ratio: 70-80%); (S150) Annealing(Annealing **temperature** : 780-880[deg.]C); (S160) Rough **rolling**(Top and bottom diameter ratio: 1.05:1-1.30:1); (S170) Cooling; (S180) End

7/12 © EPODOC / EPO

PN - [KR20130023721](#) A 20130308

PR - KR20110086675 20110829

AP - KR20110086675 20110829

DT - I

CNOI - [C21D8/0426](#) ; [C21D8/0436](#) ; [C21D8/0473](#) ; [C21D9/46](#) ; [C22C38/004](#) ; [C22C38/04](#) ; [C22C38/06](#) ; [C22C38/12](#)

PA - HYUNDAI STEEL CO [KR]

TI - **COLD-ROLLED STEEL SHEET AND METHOD OF MANUFACTURING THE COLD-ROLLED STEEL SHEET**

AB - PURPOSE: A **cold rolled steel** plate and a manufacturing method thereof are provided to manufacture the **cold rolled** plate with a high **yield** ration by re-melting and miniaturizing a micro extract by adding **Nb** instead of Ti and a rapidly heating and cooling during annealing. CONSTITUTION: A manufacturing method of a **cold rolled steel** plate comprises a step(105) of reheating a slab plate at 1150-1250[deg.]C of SRT(Slab Reheating **Temperature**), a step(110) of **hot-rolling** the slab plate for the finish as a **steel** plate at Ar3-Ar3+100[deg.]C of FDT(Finishing Delivery **Temperature**) and a step (120) of **coiling** the **steel** plate after cooling the **hot-rolled steel** plate at 600-700[deg.]C of CT(**Coiling Temperature**), a step(140) of **cold-rolling** the **coiled** plate after the acid cleaning treatment, a step(S150) of annealing and heat-treating the **cold rolled** plate by heating the plate to 830-870[deg.]C, and a step(160) of cooling the plate treated with annealing and heating. The slab plate is composed of, in wt%: 0.001-0.005 of C, 0.1-0.5 of **Mn**, 0.01-0.10 of Al, 0.02-0.06 of **Nb**, 0.0003-0.0015 of B, 0.004 or less of N, 0.04-0.07 of P, 0.002-0.010 of S, a remainder of Fe and unavoidable impurities. The **cold rolling** is performed at 50-80% of reduction in thickness. [Reference numerals] (AA) Start; (BB) End; (S105) Reheating slab(SRT: 1150-1250[deg.]C); (S110) **Hot rolling**(FDT: Ar3 to Ar3

+100[deg.]C); (S120) Cooling/ **coiling**(CT: 600-700[deg.]C); (S130) **Pickling**; (S140) **Cold rolling**; (S150) Annealing(heating finish **temperature** : 830-870[deg.]C); (S160) Cooling

8/12 © EPODOC / EPO

- PN - [CN102400046](#) A 20120404
- PNFP - CN102400046B B 20140402
- PR - CN20101276618 20100907
- AP - CN20101276618 20100907
- DT - I
- CT - || STSE (A)
[CN101509098](#) A 20090819 [Y] (WUHAN IRON & STEEL GROUP CORP [CN])
[Y]
[CN101348883](#) A 20090121 [Y] (UNIV BEIJING SCIENCE & TECH [CN])
[Y]
[CN101278066](#) A 20081001 [Y] (NIPPON STEEL CORP [JP])
[Y]
- PA - (A B)
ANGANG STEEL CO LTD
- TI - (A B)
High-strength bake-hardened **steel** and preparation method thereof
- AB - (A)
The invention provides high-strength bake-hardened **steel** and a preparation method thereof. The high-strength bake-hardened **steel** contains 0.001 to 0.004% of C, less than 0.4% of Si, 0.3 to 0.8% of **Mn**, 0.02 to 0.06% of P, less than 0.02% of S, 0.02 to 0.4% of Al, less than 0.004% of N, 0.01 to 0.02% of Ti, 0.01 to 0.02% of **Nb**, 0.3 to 1% of Cu, 0.3 to 1% of Ni and the balance Fe. The preparation method comprises smelting, continuous casting, **hot rolling**, **pickling cold rolling**, continuous annealing and flattening, wherein a plate blank heating **temperature** is in a range of 1150 to 1230 DEG C; an initial **hot rolling temperature** is greater than 1100 DEG C; an end **rolling temperature** is in a range of 890 to 930 DEG C; a **coiling temperature** is in a range of 670 to 730 DEG C; a **cold rolling** reduction rate is controlled in a range of 70 to 80%; a continuous annealing heating **temperature** is in a range of 800 to 860 DEG C; heat preservation time is in a range of 70 to 150 seconds; a cooling rate is in a range of 20 to 80 DEG C per second; and a flattening reduction rate is in a range of 0.4 to 1.0%. The high-strength bake-hardened **steel** obtained by the preparation method has **yield** strength greater than 260MPa, tensile strength greater than 440MPa, an elongation percentage greater than 33%, a radius r greater than 1.6 and brinell hardness (BH) greater than 30MPa.

9/12 © EPODOC / EPO

- PN - [KR20040017756](#) A 20040227
- PR - KR20020050195 20020823
- AP - KR20020050195 20020823
- DT - I
- PA - POSCO

- TI - MANUFACTURING METHOD OF HIGH STRENGTH **HOT** DIPPED GALVANIZED STRIP WITH SUPERIOR SURFACE
- AB - PURPOSE: A manufacturing method of high strength **hot** dipped galvanized strip with superior surface is provided which reduces manufacturing cost, secures competitiveness and manufactures product of high quality by substantially reducing material deviation and improving elongation of the strip as a high **yield** ratio type structural **steel**. CONSTITUTION: The manufacturing method of high strength **hot** dipped galvanized strip with superior surface comprises the processes of extracting the heated slab to a **temperature** of 1,150 to 1,250 deg.C after heating a slab containing 0.14 to 0.18 wt.% of C, 0.3 to 0.5 wt.% of **Mn**, 0.02 to 0.07 wt.% of P, 0.007 to 0.012 wt.% of S, 0.01 to 0.05 wt.% of Al and 0.01 to 0.3 wt.% of **Nb** in a heating furnace for two hours; **hot** finish **rolling** the extracted slab to a **temperature** of 860 to 900 deg.C that is the same or more than Ar3 transformation **temperature** ; manufacturing **hot rolled coil** having thickness of 1.8 to 4.5 mm by **coiling** the **hot** finish **rolled** strip to a low **temperature** of 560 to 630 deg.C; **cold rolling** the scale removed **hot rolled coil** to a target thickness after removing scale from the **hot rolled coil** by **pickling** the **hot rolled coil** in **pickling** and **cold rolling** processes, and performing alkali degreasing or electrolytic degreasing on the **cold rolled** strip in galvanizing process; and cooling the heated **coil** to a **temperature** of 440 to 460 deg.C after heating the degreased **cold rolled coil** to a **temperature** of 650 to 680 deg.C in an annealing furnace, and performing plating on the cooled **coil** in **hot** dip galvanizing pot.

10/12 © EPODOC / EPO

PN - [KR20030095071](#) A 20031218

PNFP - KR100455084B B1 20041106

PR - KR20020032586 20020611

AP - KR20020032586 20020611

DT - I

PA - (A)
POSCO [KR]

TI - (A)
MANUFACTURING METHOD OF HIGH **YIELD** RATIO TYPE HIGH STRENGTH **COLD ROLLED** GALVANIZED IRON (CGI)

AB - (A)
PURPOSE: A manufacturing method of high **yield** ratio type high strength **cold rolled** galvanized iron (CGI) is provided to realize weight lightening through thickness reduction of **steel** sheet used and improve material deviation and shape defects by manufacturing high **yield** ratio type high strength structural **steel** having tensile strength of 450 N/mm not 2. CONSTITUTION: The method comprises the steps of manufacturing **hot rolled** strip by **coiling** the **hot rolled** strip in the lower **temperature** range of 580 to 640 deg.C after extracting a **steel** slab comprising 0.14 to 0.18 wt.% of C, 0.5 to 0.7 wt.% of **Mn**, 0.02 wt.% or less of P, 0.015 wt.% or less of S, 0.02 to 0.06 wt.% of Al, 0.01 to 0.02 wt.% of **Nb** and a balance of Fe and inevitable impurities in the **temperature** range of 1,150 to 1,200 deg.C and **hot rolling** the **steel** slab at a **temperature** of 860 to 900 deg.C that is Ar3 transformation point or more; heating and cooling the **pickled** and **cold rolled hot rolled** strip in the **temperature** range of 670 to 700 deg.C after **pickling** and **cold rolling** the **hot rolled** strip; and plating the strip by

dipping the cooled **hot rolled** strip into a **hot** dip galvanizing bath, wherein the **hot** dip galvanizing bath contains 0.14 to 0.25 wt.% of Al, 50 ppm or less of Pb, 50 ppm or less of Sb and a balance of Zn and other inevitable impurities.

11/12 © EPODOC / EPO

- PN - [JP2001303180](#) A 20011031
- PNFP - JP3812279B B2 20060823
- PR - JP20000120715 20000421
- AP - JP20000120715 20000421
- DT - I
- FI - B21B3/00&A; B21B45/00&L; C21D9/48&J; C22C38/00&301T; C22C38/12; C22C38/58; C23C2/02; C23C2/06; C23C2/28; C23C2/40
- FT - 4K027/AA02; 4K027/AA23; 4K027/AB01; 4K027/AB02; 4K027/AB28; 4K027/AB42; 4K027/AC02; 4K027/AC12; 4K027/AC73; 4K027/AC87; 4K027/AD25; 4K027/AE12; 4K027/AE18; 4K037/EA01; 4K037/EA02; 4K037/EA04; 4K037/EA05; 4K037/EA06; 4K037/EA09; 4K037/EA11; 4K037/EA13; 4K037/EA15; 4K037/EA16; 4K037/EA17; 4K037/EA18; 4K037/EA19; 4K037/EA20; 4K037/EA23; 4K037/EA25; 4K037/EA27; 4K037/EA28; 4K037/EA31; 4K037/EA32; 4K037/EA36; 4K037/EB06; 4K037/EB07; 4K037/EB08; 4K037/EB09; 4K037/FA02; 4K037/FA03; 4K037/FC03; 4K037/FC04; 4K037/FC05; 4K037/FD04; 4K037/FE01; 4K037/FE02; 4K037/FE03; 4K037/FF02; 4K037/FF03; 4K037/FG00; 4K037/FH01; 4K037/FJ05; 4K037/FJ06; 4K037/FM02; 4K037/GA05; 4K037/JA01; 4K037/JA07
- PA - (A)
KAWASAKI STEEL CO
- TI - (A)
HIGH **YIELD** RATIO TYPE HIGH TENSION GALVANIZED **STEEL** SHEET EXCELLENT IN WORKABILITY AND STRAIN AGING HARDENING CHARACTERISTIC, AND ITS PRODUCING METHOD
- AB - (A)
PROBLEM TO BE SOLVED: To produce a high **yield** ratio type high tension galvanized **steel** sheet which is excellent in the workability and strain aging hardening characteristics and which can stably secure the high strength of parts for a car body, and to provide a producing method by which this galvanized **steel** sheet can stably be produced.
SOLUTION: Heat treatment from Ac1 point to Ac3 point + 100 deg.C and successive galvanization are applied to a **hot-rolled** sheet or a **cold-rolled** sheet having the composition containing <=0.20% C, <=2.0% Si, <=3.0% **Mn**, <=0.08% P, <=0.02% S, <=0.02% Al, 0.0050-0.0250% N, 0.005-0.50% **Nb** and >=3 N/Al, and after forming a galvanized layer on the surface, cooling is performed. It is desirable to apply annealing at a **temperature** not lower than Ac1 before the heat treatment and the cooling and successively to apply **pickling**. Further, it is desirable that the cooling is started within 0.5 sec after finish-**rolling** and the rapid-cooling is performed at >=40 deg.C/s cooling rate prior to the **coiling**.

12/12 © EPODOC / EPO

- PN - [JPS6393827](#) A 19880425
- PNFP - JPH0639622B B2 19940525

PR - JP19860237193 19861007

AP - JP19860237193 19861007

DT - I

CT - (A)
[JPS5920733](#) A []

FI - C21D8/04&A; C21D9/48&E; C22C38/00&301S; C22C38/06

FT - 4K032/AA01; 4K032/AA04; 4K032/AA16; 4K032/AA21; 4K032/AA26; 4K032/AA27; 4K032/AA29; 4K032/AA31; 4K032/BA01; 4K032/CA02; 4K032/CC04; 4K032/CE01; 4K032/CE02; 4K032/CG02; 4K032/CH04; 4K037/EA01; 4K037/EA05; 4K037/EA15; 4K037/EA18; 4K037/EA22; 4K037/EA23; 4K037/EA25; 4K037/EB03; 4K037/FA02; 4K037/FB00; 4K037/FC04; 4K037/FD05; 4K037/FE02; 4K037/FE03; 4K037/FG00; 4K037/FG02; 4K037/FH01; 4K037/FJ05; 4K037/FL01; 4K037/FM02

PA - (A)
NIPPON STEEL CORP

TI - (A)
PRODUCTION OF **COLD ROLLED** MILD **STEEL** SHEET BY CONTINUOUS ANNEALING HAVING EXCELLENT DEEP DRAWABILITY ORDINARY **TEMPERATURE** NON-AGING CHARACTERISTIC

AB - (A)
PURPOSE: To permit production of a titled **steel** sheet even if said sheet is **coiled** at a low temp., by specifying the compsn. of a low-carbon Al killed **steel** to expedite the separation of C during overaging. CONSTITUTION: The contents of **Mn** and S and the contents of Al, N and O of the low-carbon Al killed **steel** consisting of 0.01-0.02% C, 0.05-0.2% **Mn**, ≤0.015% S, 0.05-0.10% Al, ≤0.0040% N, and the balance Fe are adjusted to the K1, K2 range expressed by the equations I, II. After such **steel** is **hot rolled**, the **steel** is **coiled** at 550-670 deg.C and is subjected to descaling-**cold rolling**- continuous annealing, by which the **cold rolled steel** sheet having excellent deep drawability and ordinary-temp. non-aging characteristic is obtd. Since the **coiling** at the low temp. is permitted by the above-mentioned method, the deterioration in the **pickling** property and **yield** incidental to high-temp. **coiling** is eliminated. The **steel** plate which is non-aged at the ordinary temp. is obtd. by the optimization of the contents of C and **Mn** even if carbide forming elements such as Ti and **Nb** are not added thereto; further, the need for decreasing the content of C to an extremely low ratio is eliminated.