UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

23280 7590 02/09/2021

Davidson, Davidson & Kappel, LLC
589 8th Avenue
22nd Floor
New York, NY 10018

EXAMINER
SCHLEIS, DANIEL J

ART UNIT	PAPER NUMBER
1784	

DATE MAILED: 02/09/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/413,799	05/16/2019	Pascal DRILLET	20631.1028CON5	7637

TITLE OF INVENTION: Coated Steel Strips, Coated Stamped Products and Methods

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	05/10/2021

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23280 7590 02/09/2021
Davidson, Davidson & Kappel, LLC
589 8th Avenue
22nd Floor
New York, NY 10018

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/413,799	05/16/2019	Pascal DRILLET	20631.1028CON5	7637

TITLE OF INVENTION: Coated Steel Strips, Coated Stamped Products and Methods

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	05/10/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
SCHLEIS, DANIEL J	1784	428-653000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER	
SCHLEIS, DANIEL J	
ART UNIT	PAPER NUMBER
1784	

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Notice of Allowability	Application No. 16/413,799	Applicant(s) DRILLET et al.	
	Examiner Daniel J Schleis	Art Unit 1784	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to RCE filed 01/08/2021.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 48-77 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 01/08/2021.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Daniel J. Schleis/
Primary Examiner, Art Unit 1784

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Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
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Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

A search of the prior art failed to turn up a single reference or an appropriate combination of references that teaches each and every claimed limitation. In particular, the precoated steel product with the coating having the interdiffusion layer, intermediate layer, intermetallic layer, and superficial layer with a thickness greater than 30 micrometers and having the claimed iron compositions, in particular the intermetallic layer having a third mean composition being higher than the second mean iron composition.

As set forth in Applicant's remarks submitted on 8 January 2021, the previously applied prior art does not teach a process that is identical or substantially identical to that of the instant application. In particular, the prior art has no hot stamping with the parameters required to produce the claimed product, including the particular heating parameters. Accordingly, Applicant's remarks are persuasive and the previously applied prior art rejections are withdrawn.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J Schleis whose telephone number is (571)270-5636. The examiner can normally be reached on 10 AM to 4 PM Monday through Friday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Humera Sheikh can be reached on (571) 272-0604. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel J. Schleis
Primary Examiner
Art Unit 1784

/Daniel J. Schleis/
Primary Examiner, Art Unit 1784

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/413,799	DRILLET et al.
	Examiner	**Art Unit**
	Daniel J Schleis	1784

CPC						
Symbol					**Type**	**Version**
C21D	/	9	/	46	F	2013-01-01
B32B	/	15	/	012	I	2013-01-01
C23C	/	2	/	12	I	2013-01-01
C23C	/	2	/	26	I	2013-01-01
C23C	/	2	/	40	I	2013-01-01
Y10T	/	428	/	12389	A	2015-01-15
Y10T	/	428	/	12396	A	2015-01-15
Y10T	/	428	/	12757	A	2015-01-15

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	30	
/Daniel J. Schleis/ Primary Examiner, Art Unit 1784	30 January 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	48

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/413,799	DRILLET et al.
	Examiner	**Art Unit**
	Daniel J Schleis	1784

INTERNATIONAL CLASSIFICATION				
CLAIMED				
C21D	/	9	/	46

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
428	653

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	30	
/Daniel J. Schleis/ Primary Examiner, Art Unit 1784	30 January 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	48

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Posco Co. LTD. v. ArcelorMittal
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/413,799	DRILLET et al.
	Examiner	**Art Unit**
	Daniel J Schleis	1784

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	48	10	57	19	66	28	75								
2	49	11	58	20	67	29	76								
3	50	12	59	21	68	30	77								
4	51	13	60	22	69										
5	52	14	61	23	70										
6	53	15	62	24	71										
7	54	16	63	25	72										
8	55	17	64	26	73										
9	56	18	65	27	74										

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	30	
/Daniel J. Schleis/ Primary Examiner, Art Unit 1784	30 January 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	48

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/29/2021								
1	48	=								
2	49	=								
3	50	=								
4	51	=								
5	52	=								
6	53	=								
7	54	=								
8	55	=								
9	56	=								
10	57	=								
11	58	=								
12	59	=								
13	60	=								
14	61	=								
15	62	=								
16	63	=								
17	64	=								
18	65	=								
19	66	=								
20	67	=								
21	68	=								
22	69	=								
23	70	=								
24	71	=								
25	72	=								
26	73	=								
27	74	=								
28	75	=								
29	76	=								
30	77	=								

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Posco Co. LTD. v. ArcelorMittal
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/413,799	DRILLET et al.
	Examiner	Art Unit
	Daniel J Schleis	1784

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	Daniel J Schleis	1784

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor Name Search	07/08/2019	Schleis
Assignee Name Search	07/08/2019	Schleis
Reviewed Global Dossier	07/08/2019	Schleis
Non-Patent Literature Search - Google Scholar	07/08/2019	Schleis
EAST Text Search - See Search History	07/08/2019	Schleis
Reviewed File Wrappers of Other Applications in Patent Family	07/08/2019	Schleis
Reviewed Global Dossier	07/06/2020	Schleis
Reviewed File Wrappers, including search histories- in Patent Family	07/06/2020	Schleis
Non-Patent Literature Search - Google Scholar	07/06/2020	Schleis
EAST Text Search - See Search History	07/06/2020	Schleis
Reviewed File Wrappers of related applications: 12447777, 13621015, 15606770, 16414022, 16413774, 16413825, 16413729	01/29/2021	Schleis
Reviewed Global Dossier	01/29/2021	Schleis
Google Search	01/29/2021	Schleis
IP.COM Search	01/29/2021	Schleis
STN Search	01/29/2021	Schleis
Inventor Name Search	01/29/2021	Schleis
Assignee Name Search	01/29/2021	Schleis

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
C21D	9/46	01/29/2021	Schleis
c23C	2/12, 2/40, 2/26	01/29/2021	Schleis
B32B	15/012	01/29/2021	Schleis
Y10T	428/12389, 428/12396, 428/12757	01/29/2021	Schleis

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
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Page 1132 of 1430

Web Search History

date, time	web site	search string
1/29/2021 4:31:40 PM	Google Scholar	steel coated 30 microns multilayer
1/29/2021 4:54:22 PM	Google Scholar	steel coated 30 hot stamping interlayers

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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(Not for submission under 37 CFR 1.99)

Application Number	16413799
Filing Date	2019-05-16
First Named Inventor	Pascal DRILLET
Art Unit	
Examiner Name	SCHLEIS, DANIEL J
Attorney Docket Number	20631.1028CON5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5116645	A	1992-05-26	ARMCO STEEL CO LP	
	2	4257549	A	1981-03-24	ROBERTSON CO H H	
	3	5495736	A	1996-03-05	Nishi et al.	

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	1	20020114884	A1	2002-08-22	FRIEDERSDORF FRITZ J et al.	

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	1	19749706	DE	C1	1999-03-04	MANNESMANN AG	See English Abstract and EPO machine translation	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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	2	0724919	EP	A2	1996-08-07	HITACHI LTD	In English	
	3	1657004	EP	A1	2006-05-17	ARVEDI GIOVANNI	In English	
	4	2573226	CA	A1	2006-01-19	NIPPON STEEL CORP	In English	
	5	0692549	EP	A1	1996-01-17	UNITAS SA	In English	
	6	1063314	EP	A1	2000-12-27	KAWASAKI STEEL CO	In English	
	7	2720079	FR	A1	1995-11-24	LORRAINE LAMINAGE	See English Abstract and EPO machine translation	
	8	622697	AU	B2	1992-04-16	ARMCO INC	In English	
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Posco Co. LTD. v. ArcelorMittal
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	Stahl und Eisen 120 (2000) Nr. 8, Seiten 51 bis 56, "Die neue Verzinkungsanlage 2 bei Eko Stahl", "The new No. 2 hot-dip galvanizing line at Eko Stahl", Autoren: Karl Döring, Jürgen Nathow, Dietrich Kern, Michael Breiter und Dietmar Lowenberg.	
	2	Andrews, K.W. Empirical Formulae for the Calculation of Some Transformation Temperatures. Journal of the Iron and Steel Institute, 203, Part 7, July 1965, 721-727.	
	3	Enlarged Fig. 7 of U.S. 16413825 (present application)	
	4	Low Carbon, Heat-Treatable Boron Steel - Uncoated or Aluminized PreCoated, GM Worldwide Engineering Standards, GMW14400.	
	5	Patent Trial and Appeal Board Final Decision in IPR2019-01275, US 9708683, dated January 5, 2021	
	6	Gokhale, Arun M., "Report on quantitative characterization of the microstructure of Aluminium alloy surface coating on hot-stamped US BOR 1500 steel blanks" School of Materials Science and Engineering, Georgia Institute of Technology, 13 May 2019	
	7	Fan, Dong Wei et al., "Formation of an Aluminide Coating on Hot Stamped Steel" ISIJ International, Vol. 50, No. 11, 2010, pp 1713-1718	
	8	Summons in EP proceeding for EP 09701846, dated 11/18/2016	

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Posco Co. LTD. v. ArcelorMittal
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	First Named Inventor	Pascal DRILLET
	Art Unit	
	Examiner Name	SCHLEIS, DANIEL J
	Attorney Docket Number	20631.1028CON5

	9	Bourouga, Brahim, "Report on the heating of coated steel blanks for hot stamping" Laboratoire de therminque et enqerie de Nantes, 30 Aprill 2019	
	10	Imose, Masayuki, "Heating and Cooling Technology in the Continuous Annealing" Transactions ISIJ, Vol. 25, 1985, 911-932	
	11	Kolleck, R. et al., "Investigation on induction heating for hot stamping of boron alloyed steel" CIRP Annals - Manufacturing Technology 58, (2009), 275-278	
	12	Kahl, Martin, "Some like it hot" Technology focus - Hot stamping, September/October 2004 AMS	
	13	Self-study programme 339, The Passat 2006	

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EXAMINER SIGNATURE

Examiner Signature	/Daniel J. Schleis/	Date Considered	01/29/2021

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Posco Co. LTD. v. ArcelorMittal
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Examiner Name	SCHLEIS, DANIEL J
Attorney Docket Number	20631.1028CON5

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/William C. Gehris/	Date (YYYY-MM-DD)	2021-01-07
Name/Print	William C. Gehris	Registration Number	38,156

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=> search 0.15-0.5 c/mac

        650055 0.15-0.5/MAC
        365546 C/MAC
L1      135396 0.15-0.5 C/MAC
                 (0.15-0.5/MAC (P) C/MAC)

=> search 0.5-3 mn/mac

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        518829 MN/MAC
L2      325333 0.5-3 MN/MAC
                 (0.5-3/MAC (P) MN/MAC)

=> search 0

L3     1176400 0

=> search 0.1-0.5 si/mac

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        561518 SI/MAC
L4      291890 0.1-0.5 SI/MAC
                 (0.1-0.5/MAC (P) SI/MAC)

=> search 0.01-1

          1796 0.01
     121957823 1
L5          17 0.01-1
                 (0.01(W)1)

=> search 0.01-1 cr/mac

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        455122 CR/MAC
L6      133480 0.01-1 CR/MAC
                 (0.01-1/MAC (P) CR/MAC)
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=> search 0-0.2 ti/mac

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        208026 TI/MAC
L7       72787 0-0.2 TI/MAC
                (0-0.2/MAC (P) TI/MAC)

=> search 0.0005-0.08b/mac

L8           0 0.0005-0.08B/MAC

=> 0.0005-0.08 B/MAC

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"HELP COMMANDS" at an arrow prompt (=>).

=> search 0.0005-0.08 B/MAC

        159789 0.0005-0.08/MAC
        107957 B/MAC
L9        5567 0.0005-0.08 B/MAC
                (0.0005-0.08/MAC (P) B/MAC)

=> search fe/mac

L10     735777 FE/MAC

=> search l1 and l2 and l4 and l6 and l7 and l9 and l10

L11        170 L1 AND L2 AND L4 AND L6 AND L7 AND L9 AND L10

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=> search l11 and steel

           425 L11
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       1372430 STEEL
        218954 STEELS
       1386360 STEEL
                 (STEEL OR STEELS)
L12        398 L11 AND STEEL

=> search l12 and (coat or coated or coating or layer or laminate or clad)

        113012 COAT
         23266 COATS
        130099 COAT
                 (COAT OR COATS)
        987769 COATED
             2 COATEDS
        987771 COATED
                 (COATED OR COATEDS)
       1836564 COATING
        593243 COATINGS
       1936535 COATING
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       3350197 LAYER
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        168019 LAMINATE
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                 (CLAD OR CLADS)
           332 CLOTHED
         47503 CLAD
                 (CLAD OR CLOTHED)
L13        103 L12 AND (COAT OR COATED OR COATING OR LAYER OR LAMINATE OR CLAD)

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L12  ANSWER 1 OF 398  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:         2020:2713368  CAPLUS Full-text
DOCUMENT NUMBER:          174:278826
TITLE:                    Steel sheet comprising carbon, silicon and titanium
                          with high strength and excellent collision resistance
INVENTOR(S):              Nakano, Katsuya; Takeda, Kengo; Kawata, Hiroyuki;
                          Uenishi, Akihiro; Suzuki, Yuya
PATENT ASSIGNEE(S):       Nippon Steel Corporation, Japan
SOURCE:                   PCT Int. Appl., 58pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:
     PATENT NO.           KIND  DATE        APPLICATION NO.          DATE
     ---------------      ----  --------    ---------------------    --------
     WO 2020262651         A1   20201230    WO 2020-JP25352          20200626
PRIORITY APPLN. INFO.:                     JP 2019-121092       A   20190628
                                           JP 2019-121093       A   20190628
AB   A steel sheet which has a metal structure that contains, in terms of
     vol. fraction, 95% or more of tempered martensite and a total of 5% or
     less of one or more structures selected from among ferrite, pearlite,
     bainite, as-quenched martensite and residual austenite.  This steel
     sheet has a tensile strength of 1,100 MPa or more; the std. deviation of
     the Vickers hardness is 30 or less as measured under a load of 9.8 N at 30
     points in a 300μm square area that is centered at the position of t/2,
     where t is the sheet thickness, in a cross-section of the steel sheet
     10, said cross-section being parallel to the sheet thickness direction;
     and if nanohardness is measured under a max. load of 1 mN at 100 points in
     a 100μm square area that is centered at the position of t/2, the ratio
     of the measurement points that have a nanohardness difference of 3 GPa or
     more from 8 adjacent measurement points is 10% or less.
```

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IPR2024-01376

IT 2572991-88-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
RN 2572991-88-7 CAPLUS
CN Iron alloy, base, Fe 85-99,Mn 0.6-5,Si 0-2.5,Cr 0-2,Al 0-1,Co 0-1,Ni 0-1,Cu 0-0.5,Mo 0-0.5,V 0-0.5,C 0.2-0.4,B 0-0.1,Nb 0-0.1,Ta 0-0.1,Ti 0-0.1,W 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	85	-	99	7439-89-6
Mn	0.6	-	5	7439-96-5
Si	0	-	2.5	7440-21-3
Cr	0	-	2	7440-47-3
Al	0	-	1	7429-90-5
Co	0	-	1	7440-48-4
Ni	0	-	1	7440-02-0
Cu	0	-	0.5	7440-50-8
Mo	0	-	0.5	7439-98-7
V	0	-	0.5	7440-62-2
C	0.2	-	0.4	7440-44-0
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
Ta	0	-	0.1	7440-25-7
Ti	0	-	0.1	7440-32-6
W	0	-	0.1	7440-33-7

IPCI C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]
IPCR C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon silicon titanium steel sheet
IT Galvanizing
(electrogalvanizing, layer; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Hot-dip galvanizing
(layer; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Collisions
(resistance; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Microhardness
Tensile strength
Vickers hardness
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT 12597-69-2, Steel, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(sheet; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT 2572991-88-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)

L12 ANSWER 2 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2557482 CAPLUS Full-text
DOCUMENT NUMBER: 174:294718
TITLE: Steel pipe, its preparation method and application in petroleum and/or natural gas field
INVENTOR(S): Tian, Yan; Yan, Wei; Zou, Xiyang; Shi, Xianbo; Zhuo, Zhao; Yang, Ke; Shan, Yiyin; Zheng, Qiuyan
PATENT ASSIGNEE(S): Hengyang Valin Steel Tube Co., Ltd., Peop. Rep. China; Institute of Metal Research, Chinese Academy of Sciences
SOURCE: Faming Zhuanli Shenqing, 13pp.

CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 112063922	A	20201211	CN 2020-10912257	20200902

PRIORITY APPLN. INFO.: CN 2020-10912257 20200902

AB The invention provides a steel pipe, a prepn. method and application in petroleum and/or natural gas field, which has the advantages of high strength, high toughness, high sulfide stress corrosion resistance and microbial corrosion resistance. The steel pipe contains the following raw materials in percentage by wt.: C 0.08-0.30%, Si≤0.5%, Mn≤1.0%, Cu 0.5-2.0%, Al≤1.0%, Ce 0.01-0.2%, Cr 0.5-1.5%, Mo 0.5-1.5%, V≤0.3%, N≤0.005%, O≤0.005%, S≤0.005%, P≤0.005% and the balance Fe. The prepn. method comprises the following steps: smelting, pouring, electroslag remelting, rolling and heat treatment.

IT 2567490-07-5P, Carbon 0.08-0.30, aluminum 0-1.0, boron 0-0.1, calcium 0-0.1, cerium 0.01-0.2, chromium 0.5-1.5, copper 0.5-2.0, manganese 0-1.0, molybdenum 0.5-1.5, niobium 0-0.1, silicon 0-0.5, titanium 0-0.1, vanadium 0-0.3, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(steel pipe, its prepn. method and application in petroleum and/or natural gas field)

RN 2567490-07-5 CAPLUS

CN Iron alloy, base, Fe 91-98,Cu 0.5-2,Cr 0.5-1.5,Mo 0.5-1.5,Al 0-1,Mn 0-1,Si 0-0.5,C 0.1-0.3,V 0-0.3,Ce 0-0.2,B 0-0.1,Ca 0-0.1,Nb 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	98	7439-89-6
Cu	0.5	-	2	7440-50-8
Cr	0.5	-	1.5	7440-47-3
Mo	0.5	-	1.5	7439-98-7
Al	0	-	1	7429-90-5
Mn	0	-	1	7439-96-5
Si	0	-	0.5	7440-21-3
C	0.1	-	0.3	7440-44-0
V	0	-	0.3	7440-62-2
Ce	0	-	0.2	7440-45-1
B	0	-	0.1	7440-42-8
Ca	0	-	0.1	7440-70-2
Nb	0	-	0.1	7440-03-1
Ti	0	-	0.1	7440-32-6

IPCI C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-20; C22C0038-22; C22C0038-24; C22C0038-26; C22C0038-28; C22C0038-32; C21D0001-18; C21D0006-00; C21D0008-10; C21D0009-08; C22C0033-04
IPCR C22C0038-02 [I]; C21D0001-18 [I]; C21D0006-00 [I]; C21D0008-10 [I]; C21D0009-08 [I]; C22C0033-04 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-20 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel pipe prepn petroleum natural gas
IT Casting of metals
(electroslag; steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT Metals
RL: IMF (Industrial manufacture); PUR (Purification or recovery); PREP (Preparation)
(refining; steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT Corrosion-resistant materials
Heat treatment
Hot rolling
Pipes and Tubes
(steel pipe, its prepn. method and application in petroleum

and/or natural gas field)
IT Oxides (inorganic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT Smelting
(vacuum induction; steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT 1344-28-1, Alumina, formation (nonpreparative) 12173-93-2, Martensite, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT 2567490-07-5P, Carbon 0.08-0.30, aluminum 0-1.0, boron 0-0.1, calcium 0-0.1, cerium 0.01-0.2, chromium 0.5-1.5, copper 0.5-2.0, manganese 0-1.0, molybdenum 0.5-1.5, niobium 0-0.1, silicon 0-0.5, titanium 0-0.1, vanadium 0-0.3, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(steel pipe, its prepn. method and application in petroleum and/or natural gas field)
IT 1333-74-0, Hydrogen, processes
RL: REM (Removal or disposal); PROC (Process)
(steel pipe, its prepn. method and application in petroleum and/or natural gas field)

L12 ANSWER 3 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2500863 CAPLUS Full-text
DOCUMENT NUMBER: 174:278824
TITLE: HB450 grade high wear resistant thin steel sheet and production method thereof
INVENTOR(S): Zhang, Tao; Ji, Wenbo; Yang, Ying; Lin, Tianzi; Zhang, Zhe; Wang, Yubo
PATENT ASSIGNEE(S): Angang Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 10pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 112048672	A	20201208	CN 2020-10939769	20200909

PRIORITY APPLN. INFO.: CN 2020-10939769 20200909
AB The invention discloses a HB450 grade high wear resistant thin steel sheet and prodn. method thereof, which has the advantages of simple prodn. process, good forming performance and good wear resistance. The high wear resistant thin steel sheet comprises the following components in percentage by wt.: C 0.18%-0.22%, Si 0.10%-0.30%, Mn 1.0%-1.5%, Cr 0.20%-0.40%, B 0.005%-0.010%, Ti 0.03%-0.06%, Ti/B≥3.0, Als 0.015%-0.045%, and balance of Fe and inevitable impurities.
IT 2574491-27-1DP, Carbon 0.2, boron 0-3.0, chromium 0.20-0.40, manganese 1.0-1.5, silicon 0.10-0.30, titanium 0-3, titanium 0.03-0.06, iron bal., Al 0.015-0.045
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(hB450 grade high wear resistant thin steel sheet and prodn. method thereof)
RN 2574491-27-1 CAPLUS
CN INDEX NAME NOT YET ASSIGNED

Component	Component Percent	Component Registry Number
Fe	92 - 98	7439-89-6
B	0 - 3	7440-42-8
Ti	0 - 3	7440-32-6
Mn	1 - 1.5	7439-96-5
Cr	0.2 - 0.4	7440-47-3
Si	0.1 - 0.3	7440-21-3
C	0.2	7440-44-0

IPCI C22C0038-02; C22C0038-04; C22C0038-32; C22C0038-28; C22C0038-06; C21D0008-02
IPCR C22C0038-02 [I]; C21D0008-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I]; C22C0038-32 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST HB450 high wear resistant thin steel sheet prodn
IT Sheet materials
Wear-resistant materials
(hB450 grade high wear resistant thin steel sheet and prodn. method thereof)
IT 2574491-27-1DP, Carbon 0.2, boron 0-3.0, chromium 0.20-0.40, manganese 1.0-1.5, silicon 0.10-0.30, titanium 0-3, titanium 0.03-0.06, iron bal., Al 0.015-0.045
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(hB450 grade high wear resistant thin steel sheet and prodn. method thereof)

L12 ANSWER 4 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2453019 CAPLUS Full-text
DOCUMENT NUMBER: 174:38459
TITLE: Manufacture of welded components made of a deformed high-strength steel
INVENTOR(S): Otto, Manuel
PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: Ger. Offen., 15pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102019114090	A1	20201203	DE 2019-102019114090	20190527
WO 2020239671	A1	20201203	WO 2020-EP64399	20200525

PRIORITY APPLN. INFO.: DE 2019-102019114090 A 20190527
AB A method for producing a welded component achieves mech. properties in the welding seam region, in particular fatigue strength, comparable to those in the non-influenced base material, preferably even with a higher degree of strength than in the base material. This method comprises: producing a hot-rolled steel product made of a high-strength air-hardenable steel with a material thickness ≥1.5 mm, the hot-rolled steel product contg., by wt.%: C: 0.03-0.4, preferably 0.08-0.1; Mn: 1-4, preferably 1.8-2; Si: 0.09-2, preferably 0.25-0.3; Al: 0.02-2, preferably 0.02-0.05; P 0-0.1, preferably ≤0.020; S 0-0.1, preferably ≤ 0.01; N: 0.001-0.5, preferably 0.003-0.008; Ti: 0.01-0.2, preferably 0.02-0.03; Cr: 0.05-2, preferably 0.7-0.8; B: 0.001-0.1, preferably 0.0025-0.0035; Mo: 0.01-1, preferably 0.15-0.3; V: 0.01-0.2, preferably 0.05-0.08; optionally: Ni: 0.02-1; Nb: 0.01-0.1; and balance in iron including conventional steel-accompanying elements; air hardening the produced hot-rolled steel product; then deforming the hot-rolled steel product in the air-hardened state to form a component; and producing welding connections using a fusion welding process on the component.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 10023488 A1	CAPLUS
Anon				DE 102004053620 A1	CAPLUS
Anon				WO 2011000351 A1	CAPLUS
Anon				DE 4446709 A1	CAPLUS

IT 2550686-17-2P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of welded components made of a deformed high-strength steel)
RN 2550686-17-2 CAPLUS
CN Iron alloy, base, Fe 86-99,Mn 1-4,Si 0.1-2,Al 0-2,Cr 0-2,Mo 0-1,Ni 0-1,N 0-0.5,C 0-0.4,Ti 0-0.2,V 0-0.2,B 0-0.1,Nb 0-0.1,P 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	86	-	99	7439-89-6
Mn	1	-	4	7439-96-5
Si	0.1	-	2	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
N	0	-	0.5	17778-88-0
C	0	-	0.4	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0
S	0	-	0.1	7704-34-9

IPCI C21D0008-00 [I]; C22C0038-04 [I]
IPCR C21D0008-00 [I]; C22C0038-04 [I]
CC 55-9 (Ferrous Metals and Alloys)
ST welding deformation strength steel rolling
IT Automobile bodies
(chassis; manuf. of welded components made of a deformed high-strength steel)
IT Welding of metals
(gas metal-arc welding; manuf. of welded components made of a deformed high-strength steel)
IT Appliances
Automotive bumpers
Deep drawing of materials
Elongation at break
Forging
Hot rolling
Laser welding
Metalworking
Yield strength
(manuf. of welded components made of a deformed high-strength steel)
IT 12427-23-5, Bainite
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(manuf. of welded components made of a deformed high-strength steel)
IT 2550686-17-2P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of welded components made of a deformed high-strength steel)

L12 ANSWER 5 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2453018 CAPLUS Full-text
DOCUMENT NUMBER: 174:38458
TITLE: Manufacture of welded components made of a deformed high-strength steel
INVENTOR(S): Otto, Manuel
PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: PCT Int. Appl., 32pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020239671	A1	20201203	WO 2020-EP64399	20200525
DE 102019114090	A1	20201203	DE 2019-102019114090	20190527

PRIORITY APPLN. INFO.: DE 2019-102019114090 A 20190527
AB A method for producing a welded component achieves mech. properties in the

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

welding seam region, in particular fatigue strength, comparable to those in the non-influenced base material, preferably even with a higher degree of strength than in the base material. This method comprises: producing a hot-rolled steel product made of a high-strength air-hardenable steel with a material thickness ≥1.5 mm, the hot-rolled steel product contg., by wt.%: C: 0.03-0.4, preferably 0.08-0.1; Mn: 1-4, preferably 1.8-2; Si: 0.09-2, preferably 0.25-0.3; Al: 0.02-2, preferably 0.02-0.05; P 0-0.1, preferably ≤0.020; S 0-0.1, preferably ≤ 0.01; N: 0.001-0.5, preferably 0.003-0.008; Ti: 0.01-0.2, preferably 0.02-0.03; Cr: 0.05-2, preferably 0.7-0.8; B: 0.001-0.1, preferably 0.0025-0.0035; Mo: 0.01-1, preferably 0.15-0.3; V: 0.01-0.2, preferably 0.05-0.08; optionally: Ni: 0.02-1; Nb: 0.01-0.1; and balance in iron including conventional steel-accompanying elements; air hardening the produced hot-rolled steel product; then deforming the hot-rolled steel product in the air-hardened state to form a component; and producing welding connections using a fusion welding process on the component.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2009			KR 20090103779 A	
BANGARU NARASIMHA-RAO V	1999			WO 9905336 A1	CAPLUS
HANSEN STEVEN S	2007			US 20070267110 A1	CAPLUS
HARA TAKUYA	2014			US 8715430 B2	CAPLUS
PAN HUI	2019			CN 109136762 A	CAPLUS
PAN HUI	2019			CN 109402499 A	CAPLUS
SCHOETTLER JOACHIM	2009			DE 102007058222 A1	CAPLUS
SCHOTTLER JOACHIM	2017			DE 102016104295 A1	CAPLUS
VON HAGEN INGO	1999			WO 9928518 A1	CAPLUS

IT 2550686-17-2P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of welded components made of a deformed high-strength steel)

RN 2550686-17-2 CAPLUS

CN Iron alloy, base, Fe 86-99,Mn 1-4,Si 0.1-2,Al 0-2,Cr 0-2,Mo 0-1,Ni 0-1,N 0-0.5,C 0-0.4,Ti 0-0.2,V 0-0.2,B 0-0.1,Nb 0-0.1,P 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	86	-	99	7439-89-6
Mn	1	-	4	7439-96-5
Si	0.1	-	2	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
N	0	-	0.5	17778-88-0
C	0	-	0.4	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0
S	0	-	0.1	7704-34-9

IPCI C21D0008-04 [I]; B23K0009-23 [I]; C22C0038-00 [I]; C22C0038-02 [I]; C22C0038-06 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-50 [I]; C22C0038-54 [I]

IPCR C21D0008-04 [I]; B23K0009-23 [I]; C22C0038-00 [I]; C22C0038-02 [I]; C22C0038-06 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-50 [I]; C22C0038-54 [I]

CC 55-9 (Ferrous Metals and Alloys)

ST welding deformation strength steel rolling

IT Automobile bodies
(chassis; manuf. of welded components made of a deformed high-strength steel)

IT Welding of metals

(gas metal-arc welding; manuf. of welded components made of a deformed high-strength steel)
IT Appliances
Automotive bumpers
Deep drawing of materials
Elongation at break
Forging
Hot rolling
Laser welding
Metalworking
Yield strength
(manuf. of welded components made of a deformed high-strength steel)
IT 12427-23-5, Bainite
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(manuf. of welded components made of a deformed high-strength steel)
IT 2550686-17-2P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of welded components made of a deformed high-strength steel)

L12 ANSWER 6 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2383485 CAPLUS Full-text
DOCUMENT NUMBER: 174:174308
TITLE: Steel comprising specific amount of oxygen, sulfur, and cerium, its manufacturing method, and application
INVENTOR(S): Zou, Xiyang; Shi, Xianbo; Tian, Yan; Yan, Wei; Zhou, Zhengping; Yang, Ke; Li, Duanzheng; Shan, Yiyin; Zeng, Tianyi
PATENT ASSIGNEE(S): Hengyang Valin Steel Tube Co., Ltd., Peop. Rep. China; Institute of Metal Research, Chinese Academy of Sciences
SOURCE: Faming Zhuanli Shenqing, 13pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 111961976	A	20201120	CN 2020-10911376	20200902

PRIORITY APPLN. INFO.: CN 2020-10911376 20200902
AB A steel having high strength, high toughness, resistance to sulfide stress corrosion and microbial corrosion, and realizing the integration of structure and function is provided. The steel comprises the following raw materials in wt.%: 0.08-0.30 of carbon, 0-0.5 of silicon, 0-1.0 of manganese, 0.5-2.0 of copper, 0-1.0 of aluminum, 0.01-0.2 of cerium, 0.5-1.5 of chromium, 0.5-1.5 of molybdenum, 0-0.3 of vanadium, 0-0.005 of nitrogen, 0-0.005 of oxygen, 0-0.005 of sulfur, 0-0.005 of phosphorous, 0-0.1 of niobium, 0-0.1 of calcium, 0-0.1 of titanium, 0-0.1 of boron, and balance is iron. The manufg. method comprises: smelting the raw materials in a vacuum induction furnace, or sequentially passing the raw materials through an elec. furnace and refining outside the furnace, or the raw materials are sequentially subjecting to primary refining and refining outside the furnace, pouring and post-processing to obtain a steel.
IT 2567490-07-5, Aluminum 0-1.0, boron 0-0.1, calcium 0-0.1, carbon 0.08-0.30, cerium 0.01-0.2, chromium 0.5-1.5, copper 0.5-2.0, manganese 0-1.0, molybdenum 0.5-1.5, niobium 0-0.1, silicon 0-0.5, titanium 0-0.1, vanadium 0-0.3, iron bal.
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel comprising specific amt. of oxygen, sulfur, and cerium, its manufg. method, and application)
RN 2567490-07-5 CAPLUS
CN Iron alloy, base, Fe 91-98,Cu 0.5-2,Cr 0.5-1.5,Mo 0.5-1.5,Al 0-1,Mn 0-1,Si 0-0.5,C 0.1-0.3,V 0-0.3,Ce 0-0.2,B 0-0.1,Ca 0-0.1,Nb 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	98	7439-89-6
Cu	0.5	-	2	7440-50-8
Cr	0.5	-	1.5	7440-47-3
Mo	0.5	-	1.5	7439-98-7
Al	0	-	1	7429-90-5
Mn	0	-	1	7439-96-5
Si	0	-	0.5	7440-21-3
C	0.1	-	0.3	7440-44-0
V	0	-	0.3	7440-62-2
Ce	0	-	0.2	7440-45-1
B	0	-	0.1	7440-42-8
Ca	0	-	0.1	7440-70-2
Nb	0	-	0.1	7440-03-1
Ti	0	-	0.1	7440-32-6

IPCI C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-20; C22C0038-22; C22C0038-24; C21D0008-00; C21D0001-18
IPCR C22C0038-02 [I]; C21D0001-18 [I]; C21D0008-00 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-20 [I]; C22C0038-22 [I]; C22C0038-24 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST oxygen sulfur cerium steel
IT Casting of metals
Forging
Hot rolling
Purification
Smelting
(steel comprising specific amt. of oxygen, sulfur, and cerium, its manufg. method, and application)
IT 12597-69-2P, Steel, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(steel comprising specific amt. of oxygen, sulfur, and cerium, its manufg. method, and application)
IT 2567490-07-5, Aluminum 0-1.0, boron 0-0.1, calcium 0-0.1, carbon 0.08-0.30, cerium 0.01-0.2, chromium 0.5-1.5, copper 0.5-2.0, manganese 0-1.0, molybdenum 0.5-1.5, niobium 0-0.1, silicon 0-0.5, titanium 0-0.1, vanadium 0-0.3, iron bal.
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel comprising specific amt. of oxygen, sulfur, and cerium, its manufg. method, and application)

L12 ANSWER 7 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2291871 CAPLUS Full-text
DOCUMENT NUMBER: 174:84430
TITLE: 1200Mpa grade ultra high strength thick steel plate and production method thereof
INVENTOR(S): Bao, Haiyan; Liang, Baozhu; Zhu, Yingjun; Su, Liang; Yan, Min; Du, Tao; Zhang, Huan; Yu, Hongwei; Yi, Xun; Wang, Xiaodong
PATENT ASSIGNEE(S): Baowu Group Echeng Iron and Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 111910129	A	20201110	CN 2020-10804778	20200812

PRIORITY APPLN. INFO.: CN 2020-10804778 20200812
AB The invention discloses a 1200Mpa grade ultra-high strength thick steel plate and its prodn. method, which has the advantages of high tensile strength, low yield ratio and low cost. The steel plate contains the following elements by wt.: C: 0.12-0.20; Si: 0.10-0.40; Mn: 1.10-1.50; P ≤ 0.0010; S ≤ 0.0005; ALs: 0.015-0.045%; Cr: 0.10-0.50; Mo:

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IPR2024-01376

0.10-0.70; Ni: 0.05-0.20; N: ≤ 0.0045; H: ≤ 0.0002, Nb + Ti + V + B ≤ 0.10, Ti / N ≥ 3.0, balance of Fe and unavoidable impurities.

IT 2559769-05-8P, Boron 0-0.10, carbon 0.12-0.20, chromium 0.10-0.50, manganese 1.10-1.50, molybdenum 0.10-0.70, nickel 0.05-0.20, niobium 0-0.1, silicon 0.10-0.40, titanium 0-0.1, vanadium 0-0.1, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(1200Mpa grade ultra high strength thick steel plate and prodn. method thereof)

RN 2559769-05-8 CAPLUS

CN Iron alloy, base, Fe 96-98,Mn 1.1-1.5,Mo 0.1-0.7,Cr 0.1-0.5,Si 0.1-0.4,C 0.1-0.2,Ni 0-0.2,B 0-0.1,Nb 0-0.1,Ti 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	96 - 98	7439-89-6
Mn	1.1 - 1.5	7439-96-5
Mo	0.1 - 0.7	7439-98-7
Cr	0.1 - 0.5	7440-47-3
Si	0.1 - 0.4	7440-21-3
C	0.1 - 0.2	7440-44-0
Ni	0 - 0.2	7440-02-0
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
Ti	0 - 0.1	7440-32-6
V	0 - 0.1	7440-62-2

IPCI C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-44; C22C0038-46; C22C0038-48; C22C0038-54; C21D0008-02; C22C0033-04

IPCR C22C0038-02 [I]; C21D0008-02 [I]; C22C0033-04 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-54 [I]

CC 55-3 (Ferrous Metals and Alloys)

ST steel plate prepn

IT Plates
Quenching (cooling)
Rolling (metals)
Tempering
(1200Mpa grade ultra high strength thick steel plate and prodn. method thereof)

IT Group 8 elements
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(1200Mpa grade ultra high strength thick steel plate and prodn. method thereof)

IT 2559769-05-8P, Boron 0-0.10, carbon 0.12-0.20, chromium 0.10-0.50, manganese 1.10-1.50, molybdenum 0.10-0.70, nickel 0.05-0.20, niobium 0-0.1, silicon 0.10-0.40, titanium 0-0.1, vanadium 0-0.1, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(1200Mpa grade ultra high strength thick steel plate and prodn. method thereof)

L12 ANSWER 8 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2020:2054532 CAPLUS Full-text

DOCUMENT NUMBER: 173:899795

TITLE: Strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets

AUTHOR(S): Jo, Min Cheol; Jo, Min Chul; Yoo, Jisung; Song, Taejin; Kim, Sang-Heon; Sohn, Seok Su; Lee, Sunghak

CORPORATE SOURCE: Center for Advanced Aerospace Materials, Pohang University of Science and Technology, Pohang, 37673, S. Korea

SOURCE: Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing (2021), 800, 140319

CODEN: MSAPE3; ISSN: 0921-5093
DIGITAL OBJECT ID: 10.1016/j.msea.2020.140319
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB Layered architectures have been applied to twinning-induced plasticity (TWIP) steel in terms of configuring multi-layered TWIP and martensitic steel (MLS) sheets to overcome the limitation of low yield strength. However, hydrogen embrittlement (HE) inevitably appears in materials used for high-strength purposes, with the interfacial layers presenting localization sites of hydrogen, thereby limiting the materials' broad structural applications. Here, we present a novel design for MLS sheets that exhibit both strong resistance to HE and a good strength-ductility balance via surface shielding. Our hydrogen penetration data demonstrates that the proposed austenitic shielding structure effectively acts as a barrier to hydrogen due to the reduced hydrogen diffusivity, compared with existing MLS sheets. We propose the optimal surface thickness required to play the role of shielding layer based on the quantified diffusivity and the rule of mixts. of the layer fractions, which presents a plausible novel design for layered architectures that exhibit strong resistance to HE and possess tunable mech. properties.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1991		261	Electron Probe Quant	
Anon	2004			ISO 17081 Method of	
Ashby, M	2003	51	5801	Acta Mater	CAPLUS
Ashby, M	2013	68	4	Scripta Mater	CAPLUS
Barabash, R	2014	45	98	Metall Mater Trans	CAPLUS
Beachem, C	1972	3	441	Metall Mater Trans B	
Bouaziz, O	2008	10	24	Adv Eng Mater	CAPLUS
Bouaziz, O	2016	18	56	Adv Eng Mater	CAPLUS
Cetin, A	2012	60	2265	Acta Mater	CAPLUS
Chin, K	2018	24	489	Met Mater Int	CAPLUS
Cho, L	2018	734	416	Mater Sci Eng, A	CAPLUS
Cho, L	2018	735	448	Mater Sci Eng, A	CAPLUS
De Cooman, B	2011			New Trends and Devel	
Devanathan, M	1962	270	90	Proc R Soc A	CAPLUS
Dunne, D	2012	706	1568	Mater Sci Forum	
Dwivedi, S	2018	43	21603	Int J Hydrogen Energ	CAPLUS
Enomoto, M	2012	43	572	Metall Mater Trans	CAPLUS
Fang, T	2011	331	1587	Science	CAPLUS
Grassel, O	2000	16	1391	Int J Plast	CAPLUS
Gutierrez-Urrutia, I	2010	527	3552	Mater Sci Eng, A	
Gwon, H	2017	696	416	Mater Sci Eng, A	CAPLUS
Han, D	2015	99	45	Scripta Mater	CAPLUS
He, J	2018	726	288	Mater Sci Eng, A	CAPLUS
Huang, M	2018	153	235	Acta Mater	CAPLUS
Ichimura, M	1991	32	1109	Mater Trans, JIM	CAPLUS
Inoue, J	2008	59	1055	Scripta Mater	CAPLUS
Jin, J	2012	60	1680	Acta Mater	CAPLUS
Jo, M	2019	50	4085	Metall Mater Trans	CAPLUS
Jo, S	2015	627	374	J Alloys Compd	CAPLUS
Kim, J	2018	147	304	Acta Mater	CAPLUS
Kim, J	2009	505	105	Mater Sci Eng, A	
Kim, J	2017	682	164	Mater Sci Eng, A	CAPLUS
Kim, J	2019	25	912	Met Mater Int	CAPLUS
Kim, J	2019	9	6829	Sci Rep	
Koseki, T	2014	55	227	Mater Trans	CAPLUS
Koyama, M	2013	61	4607	Acta Mater	CAPLUS
Koyama, M	2017	355	1055	Science	CAPLUS
Kubin, L	2003	48	119	Scripta Mater	CAPLUS
Kwon, Y	2018	43	10129	Int J Hydrogen Energ	CAPLUS
Lee, J	2019	9	5219	Sci Rep	
Li, Y	2013	61	2588	J Mech Phys Solid	CAPLUS
Mohtadi-Bonab, M	2019	25	1109	Met Mater Int	CAPLUS
Oh, S	2020	188	366	Acta Mater	CAPLUS
Park, C	2019	25	584	Met Mater Int	CAPLUS
Park, I	2015	93	63	Corrosion Sci	CAPLUS
Park, J	2017	686	160	Mater Sci Eng, A	CAPLUS
Park, J	2019	759	320	Mater Sci Eng, A	CAPLUS

Ritchie, R	2011	10	817	Nat Mater	CAPLUS
Seok, M	2016	121	164	Acta Mater	CAPLUS
Song, E	2014	87	9	Scripta Mater	CAPLUS
Takai, K	2003	43	520	ISIJ Int	CAPLUS
Wang, M	2005	398	37	Mater Sci Eng, A	
Wang, Y	2002	419	912	Nature	CAPLUS
Wang, Y	2018	150	22	Scripta Mater	CAPLUS
Wei, Y	2014	5	3580	Nat Commun	
Wu, X	2014	2	185	Mater Res Lett	CAPLUS
Yanagimoto, J	2010	59	287	CIRP Ann - Manuf Tec	
Yokota, T	2003	43	534	ISIJ Int	CAPLUS
Yu, W	2018	727	70	Mater Sci Eng, A	CAPLUS
Zhang, Y	2019	165	15	Scripta Mater	CAPLUS

IT 2522569-69-1, C 0.35, Mn 1.3, Si 0.15, Mo 0.1, Cr 0.2, Ti 0-0.06, B 0-0.06, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

RN 2522569-69-1 CAPLUS

CN Steel, Fe 98,Mn 1.3,C 0.4,Cr 0.2,Si 0.2,Mo 0.1,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	98	7439-89-6
Mn	1.3	7439-96-5
C	0.4	7440-44-0
Cr	0.2	7440-47-3
Si	0.2	7440-21-3
Mo	0.1	7439-98-7
B	0 - 0.1	7440-42-8
Ti	0 - 0.1	7440-32-6

CC 55-8 (Ferrous Metals and Alloys)

ST TWIP steel multilayer austenite martensite shielding hydrogen embrittlement resistance

IT Diffusion
Elongation, mechanical
Fracture surface morphology
Hydrogen embrittlement
Interface
Microstructure
Multilayers
Sheet materials
Shields
Stress-strain relationship
Tensile strength
Yield strength
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 1333-74-0, Hydrogen, processes
RL: OCU (Occurrence, unclassified); PEP (Physical, engineering or chemical process); OCCU (Occurrence); PROC (Process)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 12173-93-2, Martensite, processes 12244-31-4, Austenite, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 2362540-95-0, C 1.2, Mn 13, Si 0.2, Fe bal. 2522569-69-1, C 0.35, Mn 1.3, Si 0.15, Mo 0.1, Cr 0.2, Ti 0-0.06, B 0-0.06, Fe bal., processes 2522569-74-8, C 0.7, Mn 17, Si 0.6, V 0.3, Al 1.3, Fe bal.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1155 of 1430

ACCESSION NUMBER: 2020:1995137 CAPLUS Full-text
DOCUMENT NUMBER: 173:735842
TITLE: Aluminum or aluminum alloy plated steel differential strength welded part and its manufacture
INVENTOR(S): Pan, Hua; Liu, Chengjie; Lei, Ming; Wu, Yue; Sun, Zhongqu; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 27pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020200110	A1	20201008	WO 2020-CN81743	20200327
CN 111215751	A	20200602	CN 2019-10249188	20190329

PRIORITY APPLN. INFO.: CN 2019-10249188 A 20190329

AB The different-strength steel welding component is formed by means of butt welding of a high-strength steel plate and a low-strength steel plate, and each of the high-strength steel plate and the low-strength steel plate comprises a base body and at least one pure aluminum or aluminum-alloy plating on a surface of the base body. The components of the base body of the high-strength steel plate, in percentages by wt., are: 0.08-0.8% of C, 0.05-1.0% of Si, 0.1-5% of Mn, P < 0.3%, S < 0.1%, Al < 0.3%, Ti < 0.5%, 0.0005-0.1% of B, 0.01-3% of Cr, and the remaining components are Fe and inevitable impurities. The components of the base body of the low-strength steel plate, in percentages by wt., are: 0.03-0.1% of C, 0-0.3% of Si, 0.5-2.0% of Mn, P < 0.1%, S < 0.05%, Al < 0.1%, 0-0.1% of Cr, 0-0.05% of Ti, and the remaining components are Fe and inevitable impurities. The tensile strength of a welding seam of the welding component after hot stamping is greater than the tensile strength of a low-strength steel base metal, and the elongation is greater than 4%, such that application requirements of the welding component in the field of automobile hot stamping are met. The present invention also relates to a method for manufg. a different-strength steel welding component with an aluminum or aluminum-alloy plating, a different-strength steel welding component with an aluminum or aluminum-alloy plating that is prepd. by means of the method, and a welding wire used in the method.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ALIPS PHILIPPE	2004			US 20040200813 A1	
BECKER JENS-ULRIK	2017			CN 106794671 A	CAPLUS
GARCIA MICHEL	2015			CN 105163895 A	CAPLUS
GU HONGPING	2017			CN 106687248 A	CAPLUS
LUZIUS SEVERIN	2015			US 20150034615 A1	
PAN HUA	2017			CN 106334875 A	CAPLUS
WANG XIAONAN	2018			CN 108838541 A	CAPLUS

IT 2067242-22-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)
RN 2067242-22-0 CAPLUS
CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B23K0026-26 [I]; B23K0026-322 [I]; B23K0026-12 [I]; C22C0038-38 [I];
C22C0038-32 [I]; C22C0038-28 [I]; C22C0038-06 [I]; C22C0038-04 [I];
C22C0038-02 [I]
IPCR B23K0026-26 [I]; B23K0026-12 [I]; B23K0026-322 [I]; C22C0038-02 [I];
C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I]; C22C0038-32 [I];
C22C0038-38 [I]
CC 55-9 (Ferrous Metals and Alloys)
ST aluminum alloy plated steel differential strength welded part
IT Laser welding
Plating process
Tensile strength
Welds
(aluminum or aluminum alloy plated steel differential
strength welded part and its manuf.)
IT Welding of metals
(gas metal-arc welding; aluminum or aluminum alloy plated steel
differential strength welded part and its manuf.)
IT 2067242-22-0 2498542-24-6, C 0.03-0.1, Si 0-0.3, Mn 0.5-2, Al
0-0.1, Cr 0-0.1, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential
strength welded part and its manuf.)
IT 2490151-16-9, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential
strength welded part and its manuf.)
IT 7429-90-5, Aluminum, uses 2087430-39-3, Si 5-11, Fe 0-4, Al bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum or aluminum alloy plated steel differential
strength welded part and its manuf.)

L12 ANSWER 10 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1945589 CAPLUS Full-text
DOCUMENT NUMBER: 173:612896
TITLE: Production of hot-rolled steel material composite
with various properties, suppressed uncontrolled
deformation, and easier further processing
INVENTOR(S): Wolske, Vanessa; Vetter, Tobias; Fechte-Heinen,
Rainer; Becker, Jens-Ulrik
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany
SOURCE: PCT Int. Appl., 30pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020193531	A1	20201001	WO 2020-EP58125	20200324

PRIORITY APPLN. INFO.: DE 2019-102019204324 A 20190328
AB This invention discloses a method to produce a hot-rolled steel material
composite with suppressed uncontrolled deformation during hot rolling and
easier further processing.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1980			JP 5570490 A	
BALKENHOL MICHAEL	2016			DE 102014111625 A1	
BENJAMIN LIEBOWITZ	1949			US 2474682 A	CAPLUS
ETZLSTORFER CHRISTOPH	2017			EP 3241675 A1	CAPLUS

IT 2490283-01-2 2490283-02-3
RL: TEM (Technical or engineered material use); USES (Uses)
(prodn. of hot-rolled steel material composite with various
properties, suppressed uncontrolled deformation, and easier further
processing)
RN 2490282-01-2 CAPLUS
CN Iron alloy, base, Fe 92-100,Ni 0-1.8,Mn 0.3-1.5,Cr 0-1,Si 0-0.8,Mo 0-0.5,C

0.1-0.4,Cu 0-0.3,Al 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,As 0-0.1,B 0-0.1,Ca 0-0.1,N 0-0.1,P 0-0.1,S 0-0.1,Sn 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 100	7439-89-6
Ni	0 - 1.8	7440-02-0
Mn	0.3 - 1.5	7439-96-5
Cr	0 - 1	7440-47-3
Si	0 - 0.8	7440-21-3
Mo	0 - 0.5	7439-98-7
C	0.1 - 0.4	7440-44-0
Cu	0 - 0.3	7440-50-8
Al	0 - 0.2	7429-90-5
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
As	0 - 0.1	7440-38-2
B	0 - 0.1	7440-42-8
Ca	0 - 0.1	7440-70-2
N	0 - 0.1	17778-88-0
P	0 - 0.1	7723-14-0
S	0 - 0.1	7704-34-9
Sn	0 - 0.1	7440-31-5

RN 2490282-02-3 CAPLUS
CN Iron alloy, base, Fe 92-99,Cr 0-2,Mn 0.3-1.5,C 0.4-0.9,Si 0-0.8,Ni 0-0.5,V 0-0.5,Cu 0-0.3,Mo 0-0.3,Al 0-0.2,Nb 0-0.2,As 0-0.1,B 0-0.1,Ca 0-0.1,N 0-0.1,P 0-0.1,S 0-0.1,Sn 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 99	7439-89-6
Cr	0 - 2	7440-47-3
Mn	0.3 - 1.5	7439-96-5
C	0.4 - 0.9	7440-44-0
Si	0 - 0.8	7440-21-3
Ni	0 - 0.5	7440-02-0
V	0 - 0.5	7440-62-2
Cu	0 - 0.3	7440-50-8
Mo	0 - 0.3	7439-98-7
Al	0 - 0.2	7429-90-5
Nb	0 - 0.2	7440-03-1
As	0 - 0.1	7440-38-2
B	0 - 0.1	7440-42-8
Ca	0 - 0.1	7440-70-2
N	0 - 0.1	17778-88-0
P	0 - 0.1	7723-14-0
S	0 - 0.1	7704-34-9
Sn	0 - 0.1	7440-31-5
Ti	0 - 0.1	7440-32-6

IPCI B32B0015-01 [I]; C22C0038-00 [I]; C22C0038-02 [I]; C22C0038-04 [I]; B21D0035-00 [I]; B23K0020-04 [I]; B23K0020-227 [I]; B23K0020-24 [I]; B23K0026-38 [I]; B23K0026-40 [I]; B23K0033-00 [I]; B23K0103-04 [I]; B23K0103-18 [I]; B21B0001-00 [I]
IPCR B32B0015-01 [I]; B21B0001-00 [I]; B21D0035-00 [I]; B23K0020-04 [I]; B23K0020-227 [I]; B23K0020-24 [I]; B23K0026-38 [I]; B23K0026-40 [I]; B23K0033-00 [I]; B23K0103-04 [N]; B23K0103-18 [N]; C22C0038-00 [I]; C22C0038-02 [I]; C22C0038-04 [I]
CC 56-11 (Nonferrous Metals and Alloys)
ST hot rolled steel composite
IT Composites
Heating
Hot rolling
(prodn. of hot-rolled steel material composite with various properties, suppressed uncontrolled deformation, and easier further processing)
IT 12597-69-2, Steel, uses 2490282-01-2 2490282-02-3

RL: TEM (Technical or engineered material use); USES (Uses)
(prodn. of hot-rolled steel material composite with various properties, suppressed uncontrolled deformation, and easier further processing)

L12 ANSWER 11 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1569923 CAPLUS Full-text
DOCUMENT NUMBER: 173:359646
TITLE: Al-Fe-based plated steel sheet for hot press, and method for manufacturing hot press member
INVENTOR(S): Sato, Rinta; Nakajima, Seiji; Ando, Satoru
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2020122202	A	20200813	JP 2019-16283	20190131

PRIORITY APPLN. INFO.: JP 2019-16283 20190131

AB The title Al-Fe-based plated steel sheet can obtain a hot press member having excellent corrosion resistance after coating and excellent corrosion resistance at the joint portion while realizing a high temp. rising rate when subjected to heating by a furnace heating method performed before hot pressing. The Al-Fe-based plated steel sheet for hot press comprises a base steel sheet, an Al-Fe alloy plated layer formed on at least one surface of the base steel sheet with an adhesion amt. per one surface of 30-100 g/m2, having a compn. including Fe 25-90% by mass, Si 0-1% by mass and Al and unavoidable impurities as balance, and unalloyed Al attached to the surface of the Al-Fe alloy plated layer with an adhesion amt. per one surface of 0-90 mg/m2.

IT 1356847-15-8
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)
RN 1356847-15-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C22C0021-00 [I]; C22C0038-00 [I]; C22C0021-02 [I]; C22C0038-60 [I]; C21D0009-00 [I]; C21D0001-18 [I]
IPCR C23C0002-12 [I]; C21D0001-18 [I]; C21D0009-00 [I]; C22C0021-00 [I]; C22C0021-02 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C23C0002-28 [I]
CC 56-11 (Nonferrous Metals and Alloys)
ST aluminum iron plating steel sheet hot press
IT Heating
Hot-press molding
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)
IT 7429-90-5, Aluminum, processes 1356847-15-8 2460706-65-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)

L12 ANSWER 12 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1063971 CAPLUS Full-text
DOCUMENT NUMBER: 173:85787
TITLE: Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufacturing method
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 23pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020108594	A1	20200604	WO 2019-CN121860	20191129
CN 109371325	A	20190222	CN 2018-11454798	20181130

PRIORITY APPLN. INFO.: CN 2018-11454798 A 20181130

AB Provided are a zinc-based plated hot-formed steel plate or steel strip having excellent cold bending performance, and a manufg. method thereof; said zinc-based plated hot-formed steel plate or steel strip comprises a substrate having a surface decarburized layer thickness of less than 20 um and a zinc-based plated layer having an adhesion amt. of 10 to 100 g/m.cxa. 2; the component wt. percentages of the substrate are: C: 0.1-0.8%, Si: 0.05-2.0%, Mn: 0.5-3.0%, P≤0.1%, S≤0.05%, Al≤0.1%, N≤0.01%; the remainder is Fe and unavoidable impurities; the av. size of original austenite grains of the substrate is less than 15 um. After hot forming of the substrate, the hot-formed steel plate or steel strip has a tensile strength of 1500 MPa and elongation after fracture of 5%, and the coating is continuous and complete, there are no cracks extending to the substrate, and the steel plate has excellent cold bending performance.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AZUMA MASASHI	2011			JP 2011111675 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2019			CN 109371325 A	CAPLUS
JIN KWANG-KEUN	1996			KR 960005237 B1	
KAWATA HIROYUKI	2014			CN 103874776 A	CAPLUS
TAKEDA GENTARO	2018			WO 2018207560 A1	CAPLUS
TANAKA YUKIMOTO	2012			JP 2012251229 A	CAPLUS
YUANQIANG TU	2010			CN 101880832 A	CAPLUS
ZHOU SHU	2016			CN 106244923 A	CAPLUS
ZHOU SHU	2016			CN 106244923 A	CAPLUS

IT 2293976-55-1D, Aluminum 0-0.1, carbon 0.1-0.8, manganese 0.5-3, phosphorus 0-0.1, silicon 0.05-2, Cr 0-1, Mo 0-1, Ti 0-0.2, Nb 0-0.08, V 0-1, B 0-0.08, iron bal., nitrogen 0-0.01
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8

Nb 0 - 0.1 7440-03-1
P 0 - 0.1 7723-14-0

IPCI C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-60 [I]; C22C0038-06 [I]; C23C0002-40 [I]; C21D0008-02 [I]
IPCR C22C0038-02 [I]; C21D0008-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-60 [I]; C23C0002-40 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST cold bending performance zinc coating steel manuf hot stamping
IT Coating materials
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT Galvanized steel
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT Metalworking
(stamping, hot; Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT 2293976-55-1D, Aluminum 0-0.1, carbon 0.1-0.8, manganese 0.5-3, phosphorus 0-0.1, silicon 0.05-2, Cr 0-1, Mo 0-1, Ti 0-0.2, Nb 0-0.08, V 0-1, B 0-0.08, iron bal., nitrogen 0-0.01
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT 7440-66-6, Zinc, processes 98357-26-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)

L12 ANSWER 13 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1063958 CAPLUS Full-text
DOCUMENT NUMBER: 173:85818
TITLE: Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 17pp.; Chemical Indexing Equivalent to 170:379972 (CN)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020108593	A1	20200604	WO 2019-CN121859	20191129
CN 109365606	A	20190222	CN 2018-11453322	20181130
PRIORITY APPLN. INFO.:			CN 2018-11453322 A	20181130

AB A method for forming a zinc-plated steel plate or steel belt having good corrosion resistance, comprising the following steps: 1) conveying the steel plate or steel belt into a heating furnace higher than Ac3, austenitizing the steel plate or steel belt, and keeping the temp. for 1-7 min; 2) before the steel plate or steel belt leaves the heating furnace and enters a forming mold, applying different cooling manners according to different plated thicknesses, wherein when the single-sided wt. of the plating is less than or equal to 50g/m2, only air cooling is required before transferring to the forming mold, when the single-sided wt. of the plating is greater than 50g/m2, aerial fog or water mist precooling is performed before transferring to the forming mold, and the steel plate is cooled to be below 700°C at a cooling sped greater than 30°C/s; and 3) rapidly transferring the steel plate or steel belt to the mold for hot stamping forming, wherein a transferring duration does not exceed 1 min, and the temp. of the hot stamping forming is controlled between 400-800°C. The tensile strength of the steel plate or steel belt after hot stamping is greater than 1,450 MPa, and substrate cracks caused by local press and LME in an element are avoided.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AKIRA OBAYASHI	2005			CN 1600877 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2019			CN 109365606 A	CAPLUS
KOJIMA TAKESHI	2017			CN 106756697 A	CAPLUS
SEKIDO YOSHITO	2013			JP 2013227614 A	CAPLUS
TAKEBAYASHI SHIGETO	2009			JP 2009228134 A	CAPLUS
WILHELM WARNECKE	2010			CN 101849029 A	CAPLUS
YI HONGLIANG	2015			CN 104846274 A	CAPLUS

IT 2293976-55-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	91 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
C	0.1 - 0.8	7440-44-0
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI B21D0022-02 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C22C0018-00 [I]; C21D0008-02 [I]
IPCR B21D0022-02 [I]; C21D0008-02 [I]; C22C0018-00 [I]; C23C0002-06 [I]; C23C0002-40 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST corrosion resistance zinc alloy coating steel hot stamping
IT Anticorrosive coating materials
Coating materials
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT Metalworking
(stamping, hot; Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2293976-55-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2226545-76-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)

L12 ANSWER 14 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1041904 CAPLUS Full-text
DOCUMENT NUMBER: 173:612711
TITLE: Aluminum or aluminum alloy plated steel differential strength welded part and its manufacture
INVENTOR(S): Pan, Hua; Liu, Chengjie; Lei, Ming; Wu, Yue; Sun, Zhongqu; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 12pp.

CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 111215751	A	20200602	CN 2019-10249188	20190329
WO 2020200110	A1	20201008	WO 2020-CN81743	20200327

PRIORITY APPLN. INFO.: CN 2019-10249188 A 20190329

AB The invention discloses a steel differential strength welding part with an aluminum or aluminum alloy coating and a manufg. method thereof, wherein the steel differential strength welding part is formed by butt welding a high-strength steel plate and a low-strength steel plate, and the high-strength steel plate and the low-strength steel plate comprise a substrate and at least one of the surfaces of the substrate and the substrate is a pure aluminum or aluminum alloy coating; the high-strength steel plate matrix comprises the following components in percentage by wt.: c 0.08-0.8%, Si 0.05-1.0%, Mn 0.1-5%, P <0.3%, S <0.1%, Al <0.3%, Ti <0.5%, B 0.0005-0.1%, Cr 0.01-3%, residual Fe and inevitable impurities; the low-strength steel plate matrix comprises the following components in percentage by wt.: c 0.03-0.1%, Si 0-0.1%, Mn 1.0-2.0%, P <0.1%, S <0.05%, Al <0.1%, Cr 0-0.1%, Ti 0-0.05%, balance of Fe and inevitable impurities. The tensile strength of the welded part after hot stamping is greater than that of a low-strength steel base metal, the elongation is greater than 4%, and the application requirements of the welded part in the field of automobile hot stamping are met.

IT 2067242-22-0, C 0.08-0.8, Si 0.05-1, Mn 0.1-5, P 0-0.3, S 0-0.1, Al 0-0.3, Ti 0-0.5, B 0.0005-0.1, Cr 0.01-3, Fe bal.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

RN 2067242-22-0 CAPLUS
CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B23K0026-26; B23K0026-322; B23K0026-12; C22C0038-38; C22C0038-32; C22C0038-28; C22C0038-06; C22C0038-04; C22C0038-02
IPCR B23K0026-26 [I]; B23K0026-12 [I]; B23K0026-322 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-38 [I]
CC 55-9 (Ferrous Metals and Alloys)
ST r aluminum alloy plated steel differential strength welded part
IT Laser welding
Plating process
Tensile strength
Welds
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)
IT Welding of metals
(gas metal-arc welding; aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)
IT 2067242-22-0, C 0.08-0.8, Si 0.05-1, Mn 0.1-5, P 0-0.3, S 0-0.1, Al 0-0.3, Ti 0-0.5, B 0.0005-0.1, Cr 0.01-3, Fe bal. 2490151-15-8, C 0.03-0.1, Si 0-0.1, Mn 0.5-2, Al 0-0.1, Cr 0-0.1, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

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(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT 2490151-16-9, C 0.1-0.25, Si 0.2-0.4, Mn 1.2-2, Al 0-0.06, Ti 0.02-0.08, Cr 0.05-0.2, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT 7429-90-5, Aluminum, uses 1273096-81-3, Aluminum alloy
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

L12 ANSWER 15 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:185423 CAPLUS Full-text
DOCUMENT NUMBER: 172:169762
TITLE: Manufacture of hardened steel products with aluminum-based coatings
INVENTOR(S): Pohl, Stefan; Danger, Elisabeth; Labudde, Thorsten; Butzkamm, Juergen
PATENT ASSIGNEE(S): Muhr und Bender KG, Germany
SOURCE: PCT Int. Appl., 29pp.; Chemical Indexing Equivalent to 172:169761 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020020644	A1	20200130	WO 2019-EP68581	20190710
DE 102018118015	A1	20200130	DE 2018-102018118015	20180725

PRIORITY APPLN. INFO.: DE 2018-102018118015 A 20180725

AB A method for producing a hardened steel product, comprises: providing a steel substrate made of a hardenable steel; coating the steel substrate with an aluminum pre-coating, the pre-coating being applied to the steel substrate with a thickness of at least 34μm; flexibly rolling the pre-coated steel substrate in order to produce a variable thickness over the length of the pre-coated steel substrate, the pre-coating being rolled out to a reduced first thickness of less than 33μm in thinner first portions and to a reduced second thickness, which is thicker than the reduced first thickness, in thicker second portions; creating a blank from the flexibly rolled steel substrate; heating the blank to the austenitization temp., diffusion processes between the base material and the pre-coating occurring; and hot-forming the heated blank, the heated blank being formed and being quickly cooled in such a way that a hardened steel product having a coating is produced.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
BATISTA LEONARDO MESQUI	2019			EP 3489386 A1	CAPLUS
Hauger, A	1995	23	40	Fertigung	
KIM HEUNG-YUN	2018			US 20180142337 A1	
MACHADO AMORIM	2017			WO 2017017521 A1	CAPLUS
SCHNEIDER DR CHRISTOPH	2017			EP 3181248 A1	
TANAHASHI HIROYUKI	2014			US 20140044987 A1	
WINKLHOFER KERRY	2008			DE 102007019196 A1	CAPLUS
Windmann, M	2014	246	17	Surface And Coatings	CAPLUS

IT 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

RN 2408930-78-7 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-5,Cr 0-1,Mo 0-1,Si 0.1-0.9,C 0.2-0.5,Ti 0-0.2,V 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Nb 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	91	-	99	7439-89-6
Mn	0.5	-	5	7439-96-5
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Si	0.1	-	0.9	7440-21-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Nb	0	-	0.1	7440-03-1
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C21D0001-673 [I]; B21B0037-24 [I]; B21B0037-26 [I]; C23C0002-12 [I]
IPCR C21D0001-673 [I]; B21B0037-24 [I]; B21B0037-26 [I]; C23C0002-12 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST hardened steel aluminum alloy coating silicon austenizing rolling
IT Diffusion
Heat treatment
Hot-dip coating process
Metal forming
Rolling (metals)
Thermomechanical metalworking
(manuf. of hardened steel products with aluminum-based coatings)
IT Oxides (inorganic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(manuf. of hardened steel products with aluminum-based coatings)
IT 7429-90-5, Aluminum, processes 77578-10-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; manuf. of hardened steel products with aluminum-based coatings)
IT 12597-69-2, Steel, processes 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

L12 ANSWER 16 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:178086 CAPLUS Full-text
DOCUMENT NUMBER: 172:169761
TITLE: Manufacture of hardened steel products with aluminum-based coatings
INVENTOR(S): Pohl, Stefan; Danger, Elisabeth; Labudde, Thorsten; Butzkamm, Juergen
PATENT ASSIGNEE(S): Muhr und Bender KG, Germany
SOURCE: Ger. Offen., 13pp.; Chemical Indexing Equivalent to 172:169762 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102018118015	A1	20200130	DE 2018-102018118015	20180725
WO 2020020644	A1	20200130	WO 2019-EP68581	20190710

PRIORITY APPLN. INFO.: DE 2018-102018118015 A 20180725
AB A method for producing a hardened steel product, comprises: providing a steel substrate made of a hardenable steel; coating the steel substrate with an aluminum pre-coating, the pre-coating being applied to the steel substrate with a thickness of at least 34μm; flexibly rolling the pre-coated steel substrate in order to produce a variable thickness over the length of the pre-coated steel substrate, the pre-coating being rolled out to a reduced first thickness of less than

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

33μm in thinner first portions and to a reduced second thickness, which is thicker than the reduced first thickness, in thicker second portions; creating a blank from the flexibly rolled steel substrate; heating the blank to the austenitization temp., diffusion processes between the base material and the pre-coating occurring; and hot-forming the heated blank, the heated blank being formed and being quickly cooled in such a way that a hardened steel product having a coating is produced.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102005031461 A1	CAPLUS
Anon				DE 102007013739 B3	CAPLUS
Anon				DE 102007019196 A1	CAPLUS
Anon				DE 102009007909 A1	CAPLUS
Anon	2019			Feuerverzinken In:Wi	
Anon				Salzgitter Flachstah	

IT 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

RN 2408930-78-7 CAPLUS

CN Iron alloy, base, Fe 91-99,Mn 0.5-5,Cr 0-1,Mo 0-1,Si 0.1-0.9,C 0.2-0.5,Ti 0-0.2,V 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Nb 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
Mn	0.5	-	5	7439-96-5
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Si	0.1	-	0.9	7440-21-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Nb	0	-	0.1	7440-03-1
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C23F0017-00 [I]; C23C0002-12 [I]; C22C0038-04 [I]
IPCR C23F0017-00 [I]; C22C0038-04 [I]; C23C0002-12 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST hardened steel aluminum alloy coating silicon austenizing rolling
IT Diffusion
Heat treatment
Hot-dip coating process
Metal forming
Rolling (metals)
Thermomechanical metalworking
(manuf. of hardened steel products with aluminum-based coatings)
IT Oxides (inorganic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(manuf. of hardened steel products with aluminum-based coatings)
IT 7429-90-5, Aluminum, processes 77578-10-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; manuf. of hardened steel products with aluminum-based coatings)
IT 12597-69-2, Steel, processes 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

L12 ANSWER 17 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1450710 CAPLUS Full-text
TITLE: The influence of the heating rate of cemented constructional steels on the growth of austenitic grain in the process of high-temperature holding
AUTHOR(S): Kukareko, V. A.; Valko, A. L.; Chichin, A. N.
CORPORATE SOURCE: Joint Institute of Mechanical Engineering of the National Academy of Sciences of Belarus, Minsk, Belarus
SOURCE: Vestsi Natsyyanal'nai Akademii Navuk Belarusi, Seryya Fizika-Tekhnichnykh Navuk (2018), (4), 399-406
CODEN: VABNFA; ISSN: 1561-8358
DIGITAL OBJECT ID: 10.29235/1561-8358-2018-63-4-399-406
PUBLISHER: Vydavetski Dom "Belaruskaya Navuka"
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB The influence of the heating mode of samples of constructional cemented steels 20KhNZA, 20KhGNR and 15KhGN2TA on the value of austenite grain after high-temp. isothermal aging at 1000 °C is studied. It is shown that the heating of steels at a rate of 1.2-3.0 °C/min in the phase-transformation interval stabilizes the grain structure of the steels and leads to a slowing down of the kinetics of the growth of austenite grains during prolonged high-temp. aging, which makes it possible to increase the temp. of the chem.-thermal treatment of steels. It is concluded that the stabilization of the grain structure of steels is assocd. with the formation of segregation of impurity atoms and particles at grain boundaries with high-angle disorientation during slow heating, which prevents migration of grain boundaries in the process of prolonged high-temp. aging. A high-temp. chem.-thermal treatment of a batch of billets from steel 20KhNZA under exptl. conditions with stepwise heating in the phase-transformation interval provided a qual. fine-grained structure of the cemented layer.

IT INDEXING IN PROGRESS
IT 37312-00-8, 20KhGNR
RL: TEM (Technical or engineered material use); USES (Uses)
(influence of heating rate of cemented constructional steels on growth of austenitic grain in process of high-temp. holding)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 97	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 55 (Ferrous Metals and Alloys)
ST steel austenitic grain growth heating rate holding temp
IT Grain boundaries
Grain size
Heat treatment
Microhardness
Microstructure
Quenching (cooling)
(influence of heating rate of cemented constructional steels on growth of austenitic grain in process of high-temp. holding)

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IT 37312-00-8, 20KhGNR 61431-72-9, 15KhGN2TA
RL: TEM (Technical or engineered material use); USES (Uses)
(influence of heating rate of cemented constructional steels on growth of austenitic grain in process of high-temp. holding)

L12 ANSWER 18 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1382711 CAPLUS Full-text
DOCUMENT NUMBER: 171:194698
TITLE: Electric resistance welded steel pipe with excellent fatigue strength and its manufacture for oil wells
INVENTOR(S): Sadasue, Teruki; Handa, Tsunehisa; Ikeda, Michimasa
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2019116658	A	20190718	JP 2017-250540	20171227
JP 6760254	B2	20200923		

PRIORITY APPLN. INFO.: JP 2017-250540 20171227

AB The elec. resistance welding steel pipe comprises element in mass%: 0.001-0.50 of carbon (C), 0.001-2.0 of silicon (Si), 0.001-3.0 of manganese (Mn), 0-0.05 of phosphorus (P), 0-0.05 of sulfur (S), 0.010-0.060 of aluminum(Al) and balance of iron (Fe); a ferrite 0-70%, bainite contg. 30-50%, and the total of ferrite and bainite is 90% or more, and further 0-10% a structure consisting of pearlite or martensite; a fine carbides with a particle size of 0-500 nm are dispersed in the described structure, and static yield in the axial direction of the tube is obtained at the thickness center position obtained by the tensile test according to JIS Z 2241; the static yield strength in the axial direction is 360 MPa or more, and the static tensile strength is 520MPa or more; and a cyclic yield strength of 360MPa or more obtained from a cyclic stress distortion line obtained by applying a cyclic stress load of 0.1. According to the present invention, it is possible to provide a elec. resistance welding steel pipe with large thickness of 11.9mm or more, a large diam. of 219.1mm or more, and excellent fatigue strength.

IT 2363036-61-5P, C 0.001-0.50, Si 0.001-2.0, Mn 0.001-3.0, Al 0.010-0.060, Cu 0-5.0, Ni 0-5.0, Cr 0-5.0, Mo 0-5.0, Nb 0-0.5, V 0-0.5, Ti 0-0.5, B 0-0.1, Ca 0-0.1, Mis 0-0.1, Fe bal.
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(elec. resistance welded steel pipe with excellent fatigue strength and its manuf. for oil wells)
RN 2363036-61-5 CAPLUS
CN Iron alloy, base, Fe 73-100,Cr 0-5,Cu 0-5,Mo 0-5,Ni 0-5,Mn 0-3,Si 0-2,C 0-0.5,Nb 0-0.5,Ti 0-0.5,V 0-0.5,Al 0-0.1,B 0-0.1,Ca 0-0.1,misch metal 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	73 - 100	7439-89-6
Cr	0 - 5	7440-47-3
Cu	0 - 5	7440-50-8
Mo	0 - 5	7439-98-7
Ni	0 - 5	7440-02-0
Mn	0 - 3	7439-96-5
Si	0 - 2	7440-21-3
C	0 - 0.5	7440-44-0
Nb	0 - 0.5	7440-03-1
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Ca	0 - 0.1	7440-70-2
Misch metal	0 - 0.1	8049-20-5

IPCI C22C0038-00 [I]; C21D0008-02 [I]; C21D0009-08 [I]; C21D0009-50 [I];

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C22C0038-60 [I]; C22C0038-00 [I]; C21D0008-02 [I]; C21D0009-08 [I];
C21D0009-50 [I]; C22C0038-60 [I]
IPCR C22C0038-00 [I]; C21D0008-02 [I]; C21D0009-08 [I]; C21D0009-50 [I];
C22C0038-60 [I]
CC 55-9 (Ferrous Metals and Alloys)
Section cross-reference(s): 51
ST elec resistance welding steel pipe manuf oil well
IT Casting of metals
(continuous; elec. resistance welded steel pipe with excellent fatigue strength and its manuf. for oil wells)
IT Fatigue, mechanical
Hot rolling
Melting
Microstructure
Oil wells
Pipes and Tubes
Tempering
Tensile strength
Yield strength
(elec. resistance welded steel pipe with excellent fatigue strength and its manuf. for oil wells)
IT Welding of metals
(resistance welding; elec. resistance welded steel pipe with excellent fatigue strength and its manuf. for oil wells)
IT 2363036-61-5P, C 0.001-0.50, Si 0.001-2.0, Mn 0.001-3.0, Al 0.010-0.060, Cu 0-5.0, Ni 0-5.0, Cr 0-5.0, Mo 0-5.0, Nb 0-0.5, V 0-0.5, Ti 0-0.5, B 0-0.1, Ca 0-0.1, Mis 0-0.1, Fe bal.
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(elec. resistance welded steel pipe with excellent fatigue strength and its manuf. for oil wells)

L12 ANSWER 19 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1379929 CAPLUS Full-text
DOCUMENT NUMBER: 171:194695
TITLE: Large diameter electric resistance welded thick wall steel pipe with excellent fatigue strength and its manufacture for oil wells
INVENTOR(S): Sadasue, Teruki; Handa, Tsunehisa; Ikeda, Michimasa
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2019116657	A	20190718	JP 2017-250538	20171227
JP 6773020	B2	20201021		

PRIORITY APPLN. INFO.: JP 2017-250538 20171227
AB The elec. resistance welded steel pipe comprises the following components in mass(%): 0.001-0.50 of carbon (C), 0.001-2.0 of silicon (Si), 0.001-3.0 of manganese (Mn), 0-0.05 of phosphorus, 0-0.05 of sulfur (S), 0.010-0.060 of aluminum (Al), balance of iron (Fe) and unavoidable impurities. The hot-rolled steel strip having a mixed phase composed of ferrite and pearlite as the main phase, and a structure composed of the main phase and the second phase of 0-30% in area ratio, and fine carbides with a particle size of 0-500 nm are dispersed, static yield strength of at least 245 MPa in the axial direction at a thickness center position, static tensile strength of at least 415 MPa, and stress ratio of 0.1 obtained by a tensile test, and cyclic yield strength detd. from a cyclic stress distortion line obtained by applying cyclic stress is at least 245 MPa. The manufg. method of elec. resistance welded steel pipe comprises the following steps: (1) performing hot-rolled steel strip to cold bending in the width direction of the material; (2) abutting against the end portions in the width direction of the open pipe, pressing, and welding to each other to form an elec. resistance welded steel pipe; and (3) performing low-temp. tempering treatment at a tempering temp. of 150 -350°c. According to the present invention, it is possible to provide an excellent elec. resistance welded steel pipe to the fatigue

strength of the pipe outer diam. of at least 219.1mm, and wall thickness is at least 11.9mm.

IT 2363036-61-5P, C 0.001-0.50, Si 0.001-2.0, Mn 0.001-3.0, Al 0.010-0.060, Fe bal., Cu 0-5.0, Ni 0-5.0, Cr 0-5.0, Mo 0-5.0, Nb 0-0.5, V 0-0.5, Ti 0-0.5, B 0-0.1, Ca 0-0.1, Mis 0-0.1
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

RN 2363036-61-5 CAPLUS

CN Iron alloy, base, Fe 73-100,Cr 0-5,Cu 0-5,Mo 0-5,Ni 0-5,Mn 0-3,Si 0-2,C 0-0.5,Nb 0-0.5,Ti 0-0.5,V 0-0.5,Al 0-0.1,B 0-0.1,Ca 0-0.1,misch metal 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	73 - 100	7439-89-6
Cr	0 - 5	7440-47-3
Cu	0 - 5	7440-50-8
Mo	0 - 5	7439-98-7
Ni	0 - 5	7440-02-0
Mn	0 - 3	7439-96-5
Si	0 - 2	7440-21-3
C	0 - 0.5	7440-44-0
Nb	0 - 0.5	7440-03-1
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Ca	0 - 0.1	7440-70-2
Misch metal	0 - 0.1	8049-20-5

IPCI C22C0038-00 [I]; C21D0009-08 [I]; C22C0038-60 [I]; C21D0008-02 [I]; C21D0009-50 [I]; C21D0008-10 [I]; C22C0038-00 [I]; C21D0009-08 [I]; C22C0038-60 [I]; C21D0008-02 [I]; C21D0009-50 [I]; C21D0008-10 [I]

IPCR C22C0038-00 [I]; C21D0008-02 [I]; C21D0008-10 [I]; C21D0009-08 [I]; C21D0009-50 [I]; C22C0038-60 [I]

CC 55-9 (Ferrous Metals and Alloys)
Section cross-reference(s): 51

ST elec resistance welded steel pipe manuf oil well

IT Casting of metals
(continuous; large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

IT Fatigue, mechanical
Hot rolling
Melting
Metalworking
Microstructure
Oil wells
Pipes and Tubes
Tempering
Tensile strength
Yield strength
(large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

IT Carbides
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

IT Welding of metals
(resistance welding; large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

IT 2363036-61-5P, C 0.001-0.50, Si 0.001-2.0, Mn 0.001-3.0, Al 0.010-0.060, Fe bal., Cu 0-5.0, Ni 0-5.0, Cr 0-5.0, Mo 0-5.0, Nb 0-0.5, V 0-0.5, Ti 0-0.5, B 0-0.1, Ca 0-0.1, Mis 0-0.1
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(large diam. elec. resistance welded thick wall steel pipe with excellent fatigue strength and its manuf. for oil wells)

L12 ANSWER 20 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1378836 CAPLUS Full-text
DOCUMENT NUMBER: 171:194638
TITLE: Large-diameter electric-resistance welded steel pipe having thick wall and excellent fatigue strength and its manufacture for oil wells
INVENTOR(S): Sadasue, Teruki; Handa, Tsunehisa; Ikeda, Michimasa
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2019116659	A	20190718	JP 2017-250541	20171227
JP 6773021	B2	20201021		

PRIORITY APPLN. INFO.: JP 2017-250541 20171227

AB The title elec.-resistance welded (ERW) steel pipe is excellent in fatigue strength, has a thickness of 11.9 mm or more and a pipe outer diam. of 219.1 mm or more. The steel pipe is manufd. from (by wt.%) a hot-rolled steel strip composed of C: 0.001-0.50%, Si: 0.001-2.0%, Mn: 0.00-3.0%, P: 0.05% or less, S: 0.05% or less, Al: 0.010-0.060%, Fe and unavoidable impurities as balance, and having an area ratio of 80% or more of bainite and less than 20% (including 0%) of ferrite or martensite, has a cylindrical shape by cold machining. The title method comprises butting the end in the width direction, pressing, elec. resistance welding, and low temp. tempering at 150-350 °C. The steel pipe has static yield strength of 450 MPa or more, static tensile strength of 535 MPa or more. The steel pipe has a cyclic yield strength of 450 MPa or more detd. from a cyclic stress distortion obtained by applying a cyclic stress load of a Charpy absorbed energy of 27 J or more and a stress ratio of 0.1 at a test temp. of 0°C.

IT 2363036-61-5P, Aluminum 0.01-0.06, boron 0-0.1, calcium 0-0.1, carbon 0.001-0.5, chromium 0-5, copper 0-5, iron bal., manganese 0.001-3, molybdenum 0-5, nickel 0-5, niobium 0-0.5, Mis 0-0.1, silicon 0.001-2, titanium 0-0.5, vanadium 0-0.5
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(large-diam. elec.-resistance welded steel pipe having thick wall and excellent fatigue strength and its manuf. for oil wells)

RN 2363036-61-5 CAPLUS
CN Iron alloy, base, Fe 73-100,Cr 0-5,Cu 0-5,Mo 0-5,Ni 0-5,Mn 0-3,Si 0-2,C 0-0.5,Nb 0-0.5,Ti 0-0.5,V 0-0.5,Al 0-0.1,B 0-0.1,Ca 0-0.1,misch metal 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	73 - 100	7439-89-6
Cr	0 - 5	7440-47-3
Cu	0 - 5	7440-50-8
Mo	0 - 5	7439-98-7
Ni	0 - 5	7440-02-0
Mn	0 - 3	7439-96-5
Si	0 - 2	7440-21-3
C	0 - 0.5	7440-44-0
Nb	0 - 0.5	7440-03-1
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Ca	0 - 0.1	7440-70-2
Misch metal	0 - 0.1	8049-20-5

IPCI C22C0038-00 [I]; C21D0008-02 [I]; C22C0038-60 [I]; C21D0009-08 [I]; C21D0009-50 [I]; C21D0008-10 [I]; C22C0038-00 [I]; C21D0008-02 [I]; C22C0038-60 [I]; C21D0009-08 [I]; C21D0009-50 [I]; C21D0008-10 [I]
IPCR C22C0038-00 [I]; C21D0008-02 [I]; C21D0008-10 [I]; C21D0009-08 [I];

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C21D0009-50 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 51
ST elec resistance welded steel pipe
IT Bending
Compression
Fatigue, mechanical
Microstructure
Oil wells
Pipes and Tubes
Tempering
Tensile strength
Yield strength
(large-diam. elec.-resistance welded steel pipe having thick wall and excellent fatigue strength and its manuf. for oil wells)
IT Welding of metals
(resistance welding; large-diam. elec.-resistance welded steel pipe having thick wall and excellent fatigue strength and its manuf. for oil wells)
IT 2363036-61-5P, Aluminum 0.01-0.06, boron 0-0.1, calcium 0-0.1, carbon 0.001-0.5, chromium 0-5, copper 0-5, iron bal., manganese 0.001-3, molybdenum 0-5, nickel 0-5, niobium 0-0.5, Mis 0-0.1, silicon 0.001-2, titanium 0-0.5, vanadium 0-0.5
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(large-diam. elec.-resistance welded steel pipe having thick wall and excellent fatigue strength and its manuf. for oil wells)

L12 ANSWER 21 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1254928 CAPLUS Full-text
DOCUMENT NUMBER: 171:98349
TITLE: Production of cold-rolled flat steel products having metal anti-corrosion layers
INVENTOR(S): Mraczek, Klemens; Muhr, Andreas; Haneder, Bernhard
PATENT ASSIGNEE(S): Voestalpine Stahl GmbH, Austria
SOURCE: PCT Int. Appl., 38pp.; Chemical Indexing Equivalent to 171:98344 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019121793	A1	20190627	WO 2018-EP85664	20181218
DE 102017223633	A1	20190627	DE 2017-102017223633	20171221
EP 3728654	A1	20201028	EP 2018-826307	20181218
US 20200325552	A1	20201015	US 2020-16956301	20200619

PRIORITY APPLN. INFO.: DE 2017-102017223633 A 20171221
WO 2018-EP85664 W 20181218
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A cold-rolled flat steel contains, in addn. to iron and unavoidable impurities, (in wt.%): C: 0.01-0.35%, Mn: 1-4%, Si: 0.5-2.5%, Nb: up to 0.1%, Ti: 0.015-0.1%, P: up to 0.1%, Al: up to 0.15%, S: up to 0.01%, N: up to 0.1%, and optionally one or more elements from the group of rare earth metals, Mo, Cr, Zr, V, W, Co, Ni, B, Cu, Ca, with rare earth metals: up to 0.2%, Mo: up to 1%, Cr: up to 3%, Zr: up to 1%, V: up to 1%, W: up to 1%, Co: up to 1%, Ni: up to 2%, B: up to 0.1%, Cu: up to 3%, Ca: up to 0.015%. The flat steel products are manufd. by: melting then casting the steel melt to form a semi-finished product; hot-rolling the semi-finished product at 820-1000°C to form a hot strip; winding the hot strip at a temp. between room temp. and 750°C to form a coil; annealing the hot strip at 530-950°C for 1-50 h; cold-rolling the annealed hot strip to form a cold-rolled flat steel product in one or more stages with a total cold-rolling degree of at least 45%; final annealing of the cold-rolled flat steel product at 650-920°C for 30-1500 s; and applying a zinc-based metal anti-corrosion layer by electrolytic galvanizing or hot dip galvanizing of the cold-rolled and finally-annealed flat steel product. As a result of the final annealing of the cold-rolled flat steel product, an Si enrichment layer is created between a surface and a base material of the cold-rolled and

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finally-annealed flat steel product, the max. Si content of which is higher by a factor of 3-8 than the Si content of the base material and which has a depth of 10 nm to 1 μm.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARLAZAROV ARTEM	2017			EP 3146083 A1	CAPLUS
HAGA JUN	2013			JP 2013032582 A	CAPLUS
NAKAGAITO TATSUYA	2007			JP 2007224416 A	CAPLUS

IT 2351042-49-3P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

RN 2351042-49-2 CAPLUS

CN Iron alloy, base, Fe 78-98,Mn 1-4,Cr 0-3,Cu 0-3,Si 0.5-2.5,Ni 0-2,Al 0-1.5,Co 0-1,Mo 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.4,misch metal 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1,N 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	78	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Si	0.5	-	2.5	7440-21-3
Ni	0	-	2	7440-02-0
Al	0	-	1.5	7429-90-5
Co	0	-	1	7440-48-4
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
W	0	-	1	7440-33-7
Zr	0	-	1	7440-67-7
C	0	-	0.4	7440-44-0
Misch metal	0	-	0.2	8049-20-5
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8
N	0	-	0.1	17778-88-0
P	0	-	0.1	7723-14-0

IPCI C21D0006-00 [I]; B21B0001-24 [I]; B21B0001-26 [I]; B21B0001-28 [I]; C21D0007-02 [I]; C21D0007-10 [I]; C21D0008-02 [I]; C21D0008-04 [I]; C23C0002-00 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C21D0001-26 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C25F0001-06 [I]; C23G0001-08 [I]; B21B0001-22 [I]

IPCR C21D0006-00 [I]; B21B0001-22 [I]; B21B0001-24 [I]; B21B0001-26 [I]; B21B0001-28 [I]; C21D0001-26 [I]; C21D0007-02 [I]; C21D0007-10 [I]; C21D0008-02 [I]; C21D0008-04 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C23C0002-00 [I]; C23G0001-08 [I]; C25F0001-06 [I]

CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 56

ST cold rolling annealing flat steel zinc anticorrosion coating

IT Galvanizing
(electrogalvanizing; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

IT Annealing
Anticorrosive coating materials
Casting of metals
Cold rolling
Hot rolling
Hot-dip galvanizing
(prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

IT 7440-66-6P, Zinc, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; prodn. of cold-rolled flat steel products having

metal anti-corrosion layers)
IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

L12 ANSWER 22 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1241982 CAPLUS Full-text
DOCUMENT NUMBER: 171:98344
TITLE: Production of cold-rolled flat steel products having metal anti-corrosion layers
INVENTOR(S): Mraczek, Klemens; Muhr, Andreas; Haneder, Bernhard
PATENT ASSIGNEE(S): Voestalpine Stahl GmbH, Austria
SOURCE: Ger. Offen., 17pp.; Chemical Indexing Equivalent to 171:98349 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017223633	A1	20190627	DE 2017-102017223633	20171221
WO 2019121793	A1	20190627	WO 2018-EP85664	20181218
EP 3728654	A1	20201028	EP 2018-826307	20181218
US 20200325552	A1	20201015	US 2020-16956301	20200619

PRIORITY APPLN. INFO.: DE 2017-102017223633 A 20171221
WO 2018-EP85664 W 20181218
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A cold-rolled flat steel contains, in addn. to iron and unavoidable impurities, (in wt.%): C: 0.01-0.35%, Mn: 1-4%, Si: 0.5-2.5%, Nb: up to 0.1%, Ti: 0.015-0.1%, P: up to 0.1%, Al: up to 0.15%, S: up to 0.01%, N: up to 0.1%, and optionally one or more elements from the group of rare earth metals, Mo, Cr, Zr, V, W, Co, Ni, B, Cu, Ca, with rare earth metals: up to 0.2%, Mo: up to 1%, Cr: up to 3%, Zr: up to 1%, V: up to 1%, W: up to 1%, Co: up to 1%, Ni: up to 2%, B: up to 0.1%, Cu: up to 3%, Ca: up to 0.015%. The flat steel products are manufd. by: melting then casting the steel melt to form a semi-finished product; hot-rolling the semi-finished product at 820-1000°C to form a hot strip; winding the hot strip at a temp. between room temp. and 750°C to form a coil; annealing the hot strip at 530-950°C for 1-50 h; cold-rolling the annealed hot strip to form a cold-rolled flat steel product in one or more stages with a total cold-rolling degree of at least 45%; final annealing of the cold-rolled flat steel product at 650-920°C for 30-1500 s; and applying a zinc-based metal anti-corrosion layer by electrolytic galvanizing or hot dip galvanizing of the cold-rolled and finally-annealed flat steel product. As a result of the final annealing of the cold-rolled flat steel product, an Si enrichment layer is created between a surface and a base material of the cold-rolled and finally-annealed flat steel product, the max. Si content of which is higher by a factor of 3-8 than the Si content of the base material and which has a depth of 10 nm to 1 μm.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102012013113 A1	CAPLUS
Anon				DE 102015111866 A1	CAPLUS
Anon				DE 102015112886 A1	CAPLUS
Anon				DE 102015112889 A1	CAPLUS
Anon				EP 2383353 A2	CAPLUS

IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
RN 2351042-49-2 CAPLUS
CN Iron alloy, base, Fe 78-98,Mn 1-4,Cr 0-3,Cu 0-3,Si 0.5-2.5,Ni 0-2,Al

0-1.5,Co 0-1,Mo 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.4,misch metal 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1,N 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	78 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Cr	0 - 3	7440-47-3
Cu	0 - 3	7440-50-8
Si	0.5 - 2.5	7440-21-3
Ni	0 - 2	7440-02-0
Al	0 - 1.5	7429-90-5
Co	0 - 1	7440-48-4
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
W	0 - 1	7440-33-7
Zr	0 - 1	7440-67-7
C	0 - 0.4	7440-44-0
Misch metal	0 - 0.2	8049-20-5
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8
N	0 - 0.1	17778-88-0
P	0 - 0.1	7723-14-0

IPCI C22C0038-04 [I]; C22C0038-38 [I]; C22C0038-42 [I]; C22C0038-20 [I]
IPCR C22C0038-04 [I]; C22C0038-20 [I]; C22C0038-38 [I]; C22C0038-42 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST cold rolling annealing flat steel zinc anticorrosion coating
IT Galvanizing
(electrogalvanizing; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT Annealing
Anticorrosive coating materials
Casting of metals
Cold rolling
Hot rolling
Hot-dip galvanizing
(prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 7440-66-6P, Zinc, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

L12 ANSWER 23 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1102670 CAPLUS Full-text
DOCUMENT NUMBER: 171:64050
TITLE: Manufacture of bainite-martensite-austenite multiphase abrasion-resistant steel
INVENTOR(S): Liu, Xin; Zhu, Ming; Zhang, Chi; Liu, Wenli
PATENT ASSIGNEE(S): Zijing Slurry Pipeline Engineering Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 11pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109825774	A	20190531	CN 2019-10287951	20190411

CN 109825774 B 20201211
PRIORITY APPLN. INFO.: CN 2019-10287951 20190411
AB The invention discloses a prepn. method of bainite/martensite austenite multiphase abrasion-resistant steel, which adopts mutual restriction of multiple alloy elements and small addn. amt., namely, an upper bainite structure is started to widen and obtain a structure range, a heat treatment mode adopts quick cooling from austenite to BS point, an upper bainite structure and a lower bainite structure are obtained at an intermediate temp. through slow cooling and temp. change, a martensite retained austenite structure is obtained at an isothermal temp. in a low temp. range, and the whole process is continuously and continuously produced. The wear-resistant steel composed of a plurality of composite structures of upper bainite martensite austenite and lower bainite martensite austenite is obtained, and the wear-resistant steel can resist impact and cutting wear and corrosion under various environments. The prodn. process simplifies the process for controlling the cooling speed, and is convenient for large-scale prodn., simple control, good in quality and high in wear resistance.
IT 2345668-52-0P, C 0.2-0.6, Mn 1.5-5, Cr 0.1-3, Al 0.1-3, Si 0.1-3, Mo 0.1-1, Ni 0.1-2, Cu 0.1-1, P 0-0.2, B 0-0.3, V 0-1, W 0-1, Ti 0-0.3, Nb 0-0.3, Re 0-0.3, Ca 0-0.3, Sn 0-0.3, W 0-1, Fe bal.
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of bainite-martensite-austenite multiphase abrasion-resistant steel)
RN 2345668-52-0 CAPLUS
CN Iron alloy, base, Fe 77-98,Mn 1.5-5,Al 0.1-3,Cr 0.1-3,Si 0.1-3,Ni 0.1-2,Cu 0.1-1,Mo 0.1-1,V 0-1,W 0-1,C 0.2-0.6,B 0-0.3,Ca 0-0.3,Nb 0-0.3,Re 0-0.3,Sn 0-0.3,Ti 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	77	-	98	7439-89-6
Mn	1.5	-	5	7439-96-5
Al	0.1	-	3	7429-90-5
Cr	0.1	-	3	7440-47-3
Si	0.1	-	3	7440-21-3
Ni	0.1	-	2	7440-02-0
Cu	0.1	-	1	7440-50-8
Mo	0.1	-	1	7439-98-7
V	0	-	1	7440-62-2
W	0	-	1	7440-33-7
C	0.2	-	0.6	7440-44-0
B	0	-	0.3	7440-42-8
Ca	0	-	0.3	7440-70-2
Nb	0	-	0.3	7440-03-1
Re	0	-	0.3	7440-15-5
Sn	0	-	0.3	7440-31-5
Ti	0	-	0.3	7440-32-6
P	0	-	0.2	7723-14-0

IPCI C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-42; C22C0038-44; C22C0038-58; C22C0038-54; C22C0038-46; C22C0038-50; C22C0038-48; C21D0008-00; C21D0001-18
IPCR C22C0038-02 [I]; C21D0001-18 [I]; C21D0008-00 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-42 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-54 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST bainite martensite austenite multiphase abrasion resistant steel manuf
IT Abrasion-resistant materials
Casting of metals
Forging
Heat treatment
Hot rolling
Melting
Microstructure
(manuf. of bainite-martensite-austenite multiphase abrasion-resistant steel)
IT 2345668-52-0P, C 0.2-0.6, Mn 1.5-5, Cr 0.1-3, Al 0.1-3, Si 0.1-3, Mo 0.1-1, Ni 0.1-2, Cu 0.1-1, P 0-0.2, B 0-0.3, V 0-1, W 0-1, Ti 0-0.3, Nb 0-0.3, Re 0-0.3, Ca 0-0.3, Sn 0-0.3, W 0-1, Fe bal.

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of bainite-martensite-austenite multiphase abrasion-resistant steel)

L12 ANSWER 24 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1019962 CAPLUS Full-text
DOCUMENT NUMBER: 171:30626
TITLE: Ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels
AUTHOR(S): Park, Jaeyeong; Jo, Min Cheol; Song, Taejin; Kim, Hyoung Seop; Sohn, Seok Su; Lee, Sunghak
CORPORATE SOURCE: Center for Advanced Aerospace Materials, Pohang University of Science and Technology, Pohang, 790-784, S. Korea
SOURCE: Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing (2019), 759, 320-328
CODEN: MSAPE3; ISSN: 0921-5093
DIGITAL OBJECT ID: 10.1016/j.msea.2019.05.046
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB An austenitic Hadfield steel sheet shows a relatively low yield strength of 0.4-0.5 GPa and serrated flows in spite of excellent tensile strength and ductility along with highly-sustained strain hardening. In order to overcome the shortcomings, a multi-layer steel (MLS) sheet was fabricated by a roll-bonding with an ultra-high-strength martensitic hot-press-forming (HPF) steel sheet. Near the Hadfield/HPF interface, the carburized and decarburized layers were formed by the carbon diffusion from the Hadfield (1.2% of C) to HPF (0.23% of C) layers, and could generate a kind of very thin multi-layers of 35 μm in thickness. All tensile properties of the Hadfield/HPF MLS sheet (yield strength; 946 MPa, tensile strength; 1291 MPa, elongation; 44.5%) were superior to those of the Hadfield sheet. Interestingly, the persistent elongation up to 44.5%, which is higher than that of the Hadfield steel, in the present MLS sheet is a quite unique and interesting characteristic. The simultaneous enhancement of strength and ductility of the MLS sheet was explained by the contributions of (1) populated twin formation, (2) generation of geometrically necessary dislocations (GNDs), and (3) increase of back stress inside thin interfacial layers.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				K. Sato, Q. Yu, J. H	
Barbier, D	2009	500	196	Mater Sci Eng A	
Bouaziz, O	2016	18	56	Adv Eng Mater	CAPLUS
Calcagnotto, M	2011	59	658	Acta Mater	CAPLUS
Cetin, A	2012	60	2265	Acta Mater	CAPLUS
Chateau, J	2010	240	012023	J Phys Conf Ser	
Chen, L	2007	47	1804	ISIJ Int	CAPLUS
Curtze, S	2010	58	5129	Acta Mater	CAPLUS
Dini, G	2010	64	15	Mater Lett	CAPLUS
Dinsdale, A	1991	15		Calphad	CAPLUS
Dumay, A	2008	483-4	184	Mater Sci Eng A	
Eshelby, J	1951	42	351	Lond Edinb Dublin Ph	
Fan, D	2009	80	241	Steel Res Int	CAPLUS
Frommeyer, G	2003	43	438	ISIJ Int	CAPLUS
Grassel, O	2000	16	1391	Int J Plast	CAPLUS
Gwon, H	2019	25	594	Met Mater Int	CAPLUS
Han, Y	2012	553	192	Mater Sci Eng A	CAPLUS
Hild, F	2006	42	69	Strain	
Hirth, J	1982			Theory of Dislocatio	
Inoue, J	2008	59	1055	Scripta Mater	CAPLUS
Kang, M	2017	700	387	Mater Sci Eng A	CAPLUS
Kang, S	2010	527	745	Mater Sci Eng A	
Kim, J	2019			Met Mater Int	
Koseki, T	2014	55	227	Mater Trans	CAPLUS
Kubin, L	2003	48	119	Scripta Mater	CAPLUS

Kurt, B	2009	60	1035	Mater Char	CAPLUS
Laws, N	1977	7	91	J Elast	
Lebedkina, T	2009	519	147	Mater Sci Eng A	
Lee, D	1988	23	558	J Mater Sci	CAPLUS
Lee, Y	2000	31	355	Metall Mater Trans A	
Li, Y	2018	731	377	Mater Sci Eng A	CAPLUS
Liu, B	2017	679	172	Mater Sci Eng A	CAPLUS
Ma, X	2016	116	43	Acta Mater	CAPLUS
Matlock, D	2012	15	1	JESTECH	
Morito, S	2005	45	91	ISIJ Int	CAPLUS
Nambu, S	2009	69	1936	Compos Sci Technol	CAPLUS
Nambu, S	2009	60	221	Scripta Mater	CAPLUS
Ojima, M	2009	529	16	Mater Sci Eng A	
Ojima, M	2012	66	139	Scripta Mater	CAPLUS
Pan, B	2009	20	1	Meas Sci Technol	
Park, J	2017	7	40231	Sci Rep	CAPLUS
Park, K	2001	7	95	Met Mater Int	CAPLUS
Saleh, A	2011	528	4537	Mater Sci Eng A	
Scott, C	2011	102	538	Int J Mater Res	CAPLUS
Semiatin, S	1979	10	85	Metall Trans A	
Seok, M	2016	121	164	Acta Mater	CAPLUS
Srivastava, A	2008	43	5654	J Mater Sci	CAPLUS
Ueji, R	2012	47	7946	J Mater Sci	CAPLUS
Ueji, R	2008	59	963	Scripta Mater	CAPLUS
Wu, X	2015	112	14501	Proc Natl Acad Sci U	CAPLUS
Xie, G	2011	52	1709	Mater Trans	CAPLUS
Yan, F	2014	81	487	Acta Mater	CAPLUS
Yang, M	2016	4	145	Mater Res Lett	CAPLUS
Yang, W	1990	25	1821	J Mater Sci	CAPLUS
Zuidema, B	1987	18	1629	Metall Trans A	

IT 2334123-60-1, Fe bal., C 0.23, Mn 1.2, Si 0.41, Cr 0.2, Ti 0-0.06, B 0-0.06, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels)

RN 2334123-60-1 CAPLUS

CN Steel, Fe 98,Mn 1.2,Si 0.4,C 0.2,Cr 0.2,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	98			7439-89-6
Mn	1.2			7439-96-5
Si	0.4			7440-21-3
C	0.2			7440-44-0
Cr	0.2			7440-47-3
B	0	-	0.1	7440-42-8
Ti	0	-	0.1	7440-32-6

CC 55-12 (Ferrous Metals and Alloys)

ST steel multilayer sheet strength ductility microstructure

IT Elongation, mechanical
Hot-press molding
Microstructure
Multilayers
Sheet materials
Solid-solid interface
Strain hardening
Stress-strain relationship
Tensile strength
Yield strength
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels)

IT 2334123-57-6, Fe bal., C 1.2, Mn 13.6, Si 0.2 2334123-60-1, Fe bal., C 0.23, Mn 1.2, Si 0.41, Cr 0.2, Ti 0-0.06, B 0-0.06, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic

hot-press-forming steels)
OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD
(3 CITINGS)

L12 ANSWER 25 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:949375 CAPLUS Full-text
DOCUMENT NUMBER: 170:609630
TITLE: Al plated steel pipe parts by STAF method
INVENTOR(S): Maki, Jun; Fujita, Soshi; Nakamura, Toyomitsu
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 21pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2019073778	A	20190516	JP 2017-201702	20171018

PRIORITY APPLN. INFO.: JP 2017-201702 20171018

AB The present invention relates to an Al plated steel pipe parts comprising a hollow portion having a predetd. cross-sectional shape; and a flange portion projecting from the outer surface of the hollow portion; wherein the hollow portion and the flange portion are made of the same steel material as a material, and the surface of the hollow portion and the flange portion is coated with a plating layer contg. at least one of an Al-Fe-based alloy and an Al-Fe-Si-based alloy. The Al plated steel pipe parts has thickness of the plating layer is in the range of 5-50 μm, and the surface roughness of the plating layer at the flange portion is in the range of 0.3-1.2 μ m as a center line av. roughness Ra defined by JIS B0610. The Al-plated steel pipe part has excellent spot weldability manufd. by processing an Al-plated steel pipe by the STAF method.

IT 2320493-55-6, Aluminum 0-0.1, boron 0.0001-0.1, carbon 0.15-0.5, chromium 0-1.5, iron bal., manganese 0.6-3, nitrogen 0-0.006, phosphorus 0-0.01, silicon 0.01-2, titanium 0.01-0.1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum plated steel pipe parts by STAF method)
RN 2320493-55-6 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.6-3,Si 0-2,Cr 0-1.5,C 0.2-0.5,Al 0-0.1,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.6	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1.5	7440-47-3
C	0.2	-	0.5	7440-44-0
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Ti	0	-	0.1	7440-32-6

IPCI C23C0002-12 [I]; C23C0002-26 [I]; C22C0038-00 [I]; C22C0038-04 [I]; C22C0038-38 [I]; B21D0026-035 [N]; B21D0026-059 [N]; C22C0021-02 [N]; C21D0009-08 [N]
IPCR C23C0002-12 [I]; C22C0038-00 [I]; C22C0038-04 [I]; C22C0038-38 [I]; C23C0002-26 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST aluminum plating steel pipe parts
IT Coating materials
Pipes and Tubes
(aluminum plated steel pipe parts by STAF method)
IT 12043-58-2
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(aluminum plated steel pipe parts by STAF method)
IT 2320493-55-6, Aluminum 0-0.1, boron 0.0001-0.1, carbon 0.15-0.5, chromium 0-1.5, iron bal., manganese 0.6-3, nitrogen 0-0.006, phosphorus 0-0.01, silicon 0.01-2, titanium 0.01-0.1

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum plated steel pipe parts by STAF method)

IT 1314-13-2, Zinc oxide, uses 7429-90-5, Aluminum, uses 11114-60-6 11116-16-8, Titanium nitride 11122-26-2 12705-37-2, Chromium nitride
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum plated steel pipe parts by STAF method)

L12 ANSWER 26 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:903363 CAPLUS Full-text
DOCUMENT NUMBER: 170:588989
TITLE: Piercer plug made of seamless steel, and its manufacturing method
INVENTOR(S): Hidaka, Yasuyoshi; Shirasawa, Naoya; Miyai, Tatsuya
PATENT ASSIGNEE(S): Nippon Steel Corporation, Japan
SOURCE: PCT Int. Appl., 27pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019087510	A1	20190509	WO 2018-JP29879	20180809
CN 111315906	A	20200619	CN 2018-80071094	20180809
BR 112020002943	A2	20200811	BR 2020-112020002943	20180809
EP 3705591	A1	20200909	EP 2018-874192	20180809
US 20200263282	A1	20200820	US 2020-16646739	20200312

PRIORITY APPLN. INFO.: JP 2017-212753 A 20171102
WO 2018-JP29879 W 20180809
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The piercer plug comprises the following component in mass (%): 0.15-0.3 of carbon, 0.4-1.2 of silicon, 0.2-1.5 of manganese, 0.1-2 of nickel, 0-4 each of molybdenum and tungsten, 1-4 of chromium, 0-0.2 of boron, 0-1 of niobium , 0-1 of vanadium, 0-1 of titanium, and iron being balance and impurities. The piercer plug further comprises a tip section and a body section made of the same material; wherein the body section includes a cylindrical unit which is a hole for attaching a bar and the tip section is harder than the cylindrical unit. The manufg. method of piercer plug comprises a protective film forming on the surface of the piercer plug to the heating, wherein the protective film is a thermal sprayed coating and a buildup layer. According to the present invention, it is possible to provide a highly recyclable piercer plug.
IT 2315454-12-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(piercer plug made of seamless steel, and its manufg. method)
RN 2315454-12-5 CAPLUS
CN Iron alloy, base, Fe 82-97,Cr 1-4,Mo 0-4,W 0-4,Ni 0.1-2,Mn 0.2-1.5,Si 0.4-1.2,Nb 0-1,Ti 0-1,V 0-1,C 0.2-0.3,B 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	82	-	97	7439-89-6
Cr	1	-	4	7440-47-3
Mo	0	-	4	7439-98-7
W	0	-	4	7440-33-7
Ni	0.1	-	2	7440-02-0
Mn	0.2	-	1.5	7439-96-5
Si	0.4	-	1.2	7440-21-3
Nb	0	-	1	7440-03-1
Ti	0	-	1	7440-32-6
V	0	-	1	7440-62-2
C	0.2	-	0.3	7440-44-0
B	0	-	0.2	7440-42-8

IPCI C22C0038-00 [I]; C21D0009-00 [I]; C22C0038-54 [I]
IPCR C22C0038-00 [I]; C21D0009-00 [I]; C22C0038-54 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon boron seamless steel piercer plug

IT 2315454-12-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(piercer plug made of seamless steel, and its manufg. method)

L12 ANSWER 27 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:807393 CAPLUS Full-text
DOCUMENT NUMBER: 170:538936
TITLE: Manufacture of steel components having a metal coating protecting it against corrosion
INVENTOR(S): Banik, Janko; Koeyer, Maria; Rosenstock, Dirk; Ruthenberg, Manuela
PATENT ASSIGNEE(S): Thyssenkrupp Steel Europe AG, Germany; Thyssenkrupp AG
SOURCE: PCT Int. Appl., 26pp.; Chemical Indexing Equivalent to 170:538935 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019076720	A1	20190425	WO 2018-EP77692	20181011
DE 102017218704	A1	20190425	DE 2017-102017218704	20171019
CN 110997951	A	20200410	CN 2018-80049166	20181011
EP 3697936	A1	20200826	EP 2018-804228	20181011
US 20200216925	A1	20200709	US 2020-16647894	20200317

PRIORITY APPLN. INFO.: DE 2017-102017218704 A 20171019
WO 2018-EP77692 W 20181011
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A method for producing a steel component comprising a steel substrate and an aluminum alloy-based anti-corrosion coating, is described for use in the automotive sector.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
BANIK JANKO	2016			EP 2993248 A1	CAPLUS
COBO SEBASTIAN	2017			US 20170253941 A1	
KUSUMI K	2007			EP 1767286 A1	CAPLUS
MAKI JUN	2014			EP 2695963 A1	CAPLUS
ROSENSTOCK DIRK	2018			WO 2018234102 A1	CAPLUS

IT 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)
RN 2307271-66-3 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI C21D0001-76 [I]; B21D0022-02 [I]; B21D0022-20 [I]; C21D0007-13 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-28 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C21D0001-673 [I]
IPCR C21D0001-76 [I]; B21D0022-02 [I]; B21D0022-20 [I]; C21D0001-673 [I]; C21D0007-13 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-28 [I]

CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel metal prevention corrosion coating
IT Automobile bodies
(chassis; manuf. of steel components having a metal coating protecting it against corrosion)
IT Anticorrosive coating materials
Automobile bodies
Automotive bumpers
(manuf. of steel components having a metal coating protecting it against corrosion)
IT 1273096-81-3P, Aluminum alloy 2307271-67-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anti-corrosion coatings; manuf. of steel components having a metal coating protecting it against corrosion)
IT 1333-74-0, Hydrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in steel; manuf. of steel components having a metal coating protecting it against corrosion)
IT 12597-69-2P, Steel, preparation 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)

L12 ANSWER 28 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:805627 CAPLUS Full-text
DOCUMENT NUMBER: 170:527030
TITLE: Enamelling of high-strength steels
INVENTOR(S): Myslowicki, Stefan
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany; ThyssenKrupp AG
SOURCE: PCT Int. Appl., 28pp.; Chemical Indexing Equivalent to 170:527029 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019076717	A1	20190425	WO 2018-EP77686	20181011
DE 102017218434	A1	20190418	DE 2017-102017218434	20171016
EP 3697545	A1	20200826	EP 2018-786281	20181011
PRIORITY APPLN. INFO.:			DE 2017-102017218434 A	20171016
			WO 2018-EP77686 W	20181011

AB A shaped part having at least two layers, comprises at least one layer made of high-strength steel with a tensile strength ≥500 MPa and a hardness ≥160 HV, and at least one layer made of a steel that has an enamel layer on the outer side. The shaped part are suitable for producing pipelines, pressure vessels, reactors or in app. engineering, in particular for the transport of aq. and/or corrosive media.
IT 2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)
RN 2306234-82-0 CAPLUS
CN Iron alloy, base, Fe 85-99,Mn 0.5-3,Al 0-3,Si 0.1-2.5,P 0-1.5,Cr 0-1,Mo 0-1,V 0-1,Ti 0-0.8,Nb 0-0.5,C 0-0.4,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	85	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Al	0	-	3	7429-90-5
Si	0.1	-	2.5	7440-21-3
P	0	-	1.5	7723-14-0
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2

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    Ti      0   -   0.8      7440-32-6
    Nb      0   -   0.5      7440-03-1
    C       0   -   0.4      7440-44-0
    B       0   -   0.1      7440-42-8
    S       0   -   0.1      7704-34-9

IPCI B21B0001-38 [I]; C21D0008-02 [I]; C21D0009-46 [I]; C22C0038-02 [I];
     C23D0005-00 [I]
IPCR B21B0001-38 [I]; C21D0008-02 [I]; C21D0009-46 [I]; C22C0038-02 [I];
     C23D0005-00 [I]
CC   55-6 (Ferrous Metals and Alloys)
     Section cross-reference(s): 57
ST   enamel strength steel bilayer
IT   Enameling
     Enamels (vitreous)
     Pipelines
     Pressure vessels
     Reactors
        (enamelling of high-strength steels)
IT   2306234-83-1P, preparation
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (enameled; enamelling of high-strength steels)
IT   12597-69-2P, Steel, preparation   59816-66-9P, preparation
     2306234-82-0P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (enamelling of high-strength steels)


L12  ANSWER 29 OF 398  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2019:802752  CAPLUS Full-text
DOCUMENT NUMBER:         170:538935
TITLE:                   Manufacture of steel components having a metal
                         coating protecting it against corrosion
INVENTOR(S):             Banik, Janko; Koeyer, Maria; Rosenstock, Dirk;
                         Ruthenberg, Manuela
PATENT ASSIGNEE(S):      Thyssenkrupp AG, Germany; Thyssenkrupp Steel Europe AG
SOURCE:                  Ger. Offen., 17pp.; Chemical Indexing Equivalent to
                         170:538936 (WO)
                         CODEN: GWXXBX
DOCUMENT TYPE:           Patent
LANGUAGE:                German
FAMILY ACC. NUM. COUNT:  2
PATENT INFORMATION:
     PATENT NO.          KIND  DATE        APPLICATION NO.          DATE
     ----------------    ----  --------    ---------------------    --------
     DE 102017218704      A1   20190425    DE 2017-102017218704     20171019
     WO 2019076720        A1   20190425    WO 2018-EP77692          20181011
     CN 110997951         A    20200410    CN 2018-80049166         20181011
     EP 3697936           A1   20200826    EP 2018-804228           20181011
     US 20200216925       A1   20200709    US 2020-16647894         20200317
PRIORITY APPLN. INFO.:                    DE 2017-102017218704 A   20171019
                                          WO 2018-EP77692      W   20181011
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB   A method for producing a steel component comprising a steel substrate
     and an aluminum alloy-based anti-corrosion coating, is described for use
     in the automotive sector.
RETABLE
   Referenced Author   |Year | VOL | PG   | Referenced Work    | Referenced
         (RAU)         |(RPY)|(RVL)|(RPG) |      (RWK)         | File
=======================+=====+=====+======+====================+===========
Anon                   |     |     |      |EP 1767286 A1       |CAPLUS
Anon                   |     |     |      |US 20120085467 A1   |CAPLUS
Anon                   |     |     |      |EP 2377965 A2       |CAPLUS
Anon                   |     |     |      |EP 2993248 A1       |CAPLUS
IT   2307271-66-3P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (strips; manuf. of steel components having a metal coating
        protecting it against corrosion)
RN   2307271-66-3  CAPLUS
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CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI C22C0038-04 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C21D0001-673 [I]
IPCR C22C0038-04 [I]; C21D0001-673 [I]; C23C0002-12 [I]; C23C0002-26 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel metal prevention corrosion coating
IT Automobile bodies
(chassis; manuf. of steel components having a metal coating protecting it against corrosion)
IT Anticorrosive coating materials
Automobile bodies
Automotive bumpers
(manuf. of steel components having a metal coating protecting it against corrosion)
IT 1273096-81-3P, Aluminum alloy 2307271-67-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anti-corrosion coatings; manuf. of steel components having a metal coating protecting it against corrosion)
IT 1333-74-0, Hydrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in steel; manuf. of steel components having a metal coating protecting it against corrosion)
IT 12597-69-2P, Steel, preparation 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)

L12 ANSWER 30 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:746016 CAPLUS Full-text
DOCUMENT NUMBER: 170:527029
TITLE: Enamelling of high-strength steels
INVENTOR(S): Myslowicki, Stefan
PATENT ASSIGNEE(S): ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE: Ger. Offen., 20pp.; Chemical Indexing Equivalent to 170:527030 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017218434	A1	20190418	DE 2017-102017218434	20171016
WO 2019076717	A1	20190425	WO 2018-EP77686	20181011
EP 3697545	A1	20200826	EP 2018-786281	20181011
PRIORITY APPLN. INFO.:			DE 2017-102017218434 A	20171016
			WO 2018-EP77686 W	20181011

AB A shaped part having at least two layers, comprises at least one layer made of high-strength steel with a tensile strength ≥500 MPa and a hardness ≥160 HV, and at least one layer made of a steel that has an enamel layer on the outer side. The shaped part are suitable for producing pipelines, pressure vessels, reactors or in app. engineering, in particular for the transport of aq. and/or corrosive media.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102008022709 A1	CAPLUS
Anon				DE 1533303 C2	
Anon				EP 2227574 B1	CAPLUS

IT 2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)
RN 2306234-82-0 CAPLUS
CN Iron alloy, base, Fe 85-99,Mn 0.5-3,Al 0-3,Si 0.1-2.5,P 0-1.5,Cr 0-1,Mo 0-1,V 0-1,Ti 0-0.8,Nb 0-0.5,C 0-0.4,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	85 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Al	0 - 3	7429-90-5
Si	0.1 - 2.5	7440-21-3
P	0 - 1.5	7723-14-0
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
Ti	0 - 0.8	7440-32-6
Nb	0 - 0.5	7440-03-1
C	0 - 0.4	7440-44-0
B	0 - 0.1	7440-42-8
S	0 - 0.1	7704-34-9

IPCI C23D0005-00 [I]; B23K0020-04 [I]
IPCR C23D0005-00 [I]; B23K0020-04 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 57
ST enamel strength steel bilayer
IT Enameling
Enamels (vitreous)
Pipelines
Pressure vessels
Reactors
(enamelling of high-strength steels)
IT 2306234-83-1P, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enameled; enamelling of high-strength steels)
IT 12597-69-2P, Steel, preparation 59816-66-9P, preparation 2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)

L12 ANSWER 31 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:570060 CAPLUS Full-text
DOCUMENT NUMBER: 170:493791
TITLE: Method for manufacturing hot stamped parts with aluminum-silicon alloy coating and hot stamped parts
INVENTOR(S): Tan, Ning; Fu, Jiang; Hong, Jiyao; Fang, Xuehua
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 13pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109518114	A	20190326	CN 2018-11035118	20180906
WO 2020030200	A1	20200213	WO 2019-CN104708	20190906
EP 3770295	A1	20210127	EP 2019-847997	20190906

PRIORITY APPLN. INFO.: CN 2018-10896744 A 20180808
CN 2018-11035118 A 20180906
WO 2019-CN104708 W 20190906

AB The title method comprises the following steps of: processing steel plate coated with aluminum-silicon alloy coating to form a blank of a desired shape of the part, heat treating the blank, and hot stamping. The blank heat treatment adopts two-stage or three-stage heating and heat preservation, and the heating and heat preservation are stepwise heating. The steel plate coated with aluminum-silicon alloy coating include a substrate and an aluminum-silicon alloy coating on at least one surface thereof. The method fully considers the characteristics of the aluminum-silicon coating, is able to effectively solve the problem of roll banding of the aluminum-silicon coating, reduces the nodulation probability of the roller of the heat treatment furnace, improves the service life of the roller, and ensures the integrity of the coating of the hot stamped part as well as the mech. property, welding property, coating property and corrosion resisting property of the part.

IT 2305367-85-3P, Aluminum 0-0.3, boron 0-0.1, carbon 0.04-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1.2, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)

RN 2305367-85-3 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1.2,C 0-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1.2	7440-21-3
C	0	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI C23C0002-12; C23C0002-40; C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-28; C22C0038-32; C22C0038-38; C21D0001-26; C21D0008-00; B21D0022-02
IPCR C23C0002-12 [I]; B21D0022-02 [I]; C21D0001-26 [I]; C21D0008-00 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C23C0002-40 [I]
CC 56-11 (Nonferrous Metals and Alloys)
ST hot stamping steel aluminum silicon coating
IT 2305367-85-3P, Aluminum 0-0.3, boron 0-0.1, carbon 0.04-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1.2, sulfur 0-0.1, titanium 0-0.5, iron bal. 2305367-88-6P, Iron 0-4, silicon 4-14, aluminum bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)

L12 ANSWER 32 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:410880 CAPLUS Full-text
DOCUMENT NUMBER: 170:369087
TITLE: Austenitic abrasion resistant steel sheet
INVENTOR(S): Fujioka, Masaaki; Namekawa, Tetsuya; Yoshimura, Masahide; Minagawa, Masaki
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Tokkyo Koho, 22pp.
CODEN: JTXXFF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 6477983	B1	20190306	JP 2018-542295	20180329
WO 2019186906	A1	20191003	WO 2018-JP13281	20180329
KR 2019115094	A	20191010	KR 2019-7027564	20180329
KR 2123604	B1	20200615		
AU 2018412622	A1	20191017	AU 2018-412622	20180329
CN 110546290	A	20191206	CN 2018-80022906	20180329
CN 110546290	B	20200915		
EP 3594374	A1	20200115	EP 2018-909269	20180329
KR 2020029060	A	20200317	KR 2020-7006862	20180329
KR 2206319	B1	20210122		
BR 112019019598	A2	20200414	BR 2019-112019019598	20180329
IN 201917036722	A	20191115	IN 2019-17036722	20190912

PRIORITY APPLN. INFO.: WO 2018-JP13281 W 20180329
KR 2019-7027564 A3 20180329

AB The austenite type abrasion-proof steel sheet has specified chem. compn., and the mass% of C and Mn satisfies -13.75×C+16.5≤manganese≤-20×C+30. In the microstructure, the vol. percentage of the austenite is 40-90%, and the mean particle diam. of the austenite is 40-300μm.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2011			JP 2011219809 A	CAPLUS
Anon	2012			JP 2012107325 A	CAPLUS
Anon	2015			WO 2015147166 A1	CAPLUS
Anon	2016			JP 2016196703 A	CAPLUS
Anon	2016			JP 2016507648 A	

IT 2257425-86-6, Aluminum 0.001-0.3, boron 0-0.3, carbon 0.2-1.6, chromium 0-5, cobalt 0-3, copper 0-3, iron bal., manganese 2.5-30, molybdenum 0-2, nickel 0-3, niobium 0-0.3, nitrogen 0-1, silicon 0.01-2, tantalum 0-0.3, titanium 0-0.3, tungsten 0-2, vanadium 0-0.3, zirconium 0-0.3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(austenitic abrasion resistant steel sheet)

RN 2257425-86-6 CAPLUS

CN Iron alloy, base, Fe 45-97,Mn 2.5-30,Cr 0-5,Co 0-3,Cu 0-3,Ni 0-3,Mo 0-2,Si 0-2,W 0-2,C 0.2-1.6,N 0-1,Al 0-0.3,B 0-0.3,Nb 0-0.3,Ta 0-0.3,Ti 0-0.3,V 0-0.3,Zr 0-0.3 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	45 - 97	7439-89-6
Mn	2.5 - 30	7439-96-5
Cr	0 - 5	7440-47-3
Co	0 - 3	7440-48-4
Cu	0 - 3	7440-50-8
Ni	0 - 3	7440-02-0
Mo	0 - 2	7439-98-7
Si	0 - 2	7440-21-3
W	0 - 2	7440-33-7
C	0.2 - 1.6	7440-44-0
N	0 - 1	17778-88-0
Al	0 - 0.3	7429-90-5
B	0 - 0.3	7440-42-8
Nb	0 - 0.3	7440-03-1
Ta	0 - 0.3	7440-25-7
Ti	0 - 0.3	7440-32-6
V	0 - 0.3	7440-62-2
Zr	0 - 0.3	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0008-02 [N]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST austenitic steel sheet abrasion resistance
IT Abrasion resistance
Elongation, mechanical

Microstructure
Sheet materials
Tensile strength
Vickers hardness
Yield strength
(austenitic abrasion resistant steel sheet)

IT 2257425-86-6, Aluminum 0.001-0.3, boron 0-0.3, carbon 0.2-1.6, chromium 0-5, cobalt 0-3, copper 0-3, iron bal., manganese 2.5-30, molybdenum 0-2, nickel 0-3, niobium 0-0.3, nitrogen 0-1, silicon 0.01-2, tantalum 0-0.3, titanium 0-0.3, tungsten 0-2, vanadium 0-0.3, zirconium 0-0.3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(austenitic abrasion resistant steel sheet)

L12 ANSWER 33 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:340815 CAPLUS Full-text
DOCUMENT NUMBER: 170:379972
TITLE: Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 7pp.; Chemical Indexing Equivalent to 173:85818 (WO)
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109365606	A	20190222	CN 2018-11453322	20181130
WO 2020108593	A1	20200604	WO 2019-CN121859	20191129
PRIORITY APPLN. INFO.:			CN 2018-11453322 A	20181130

AB The invention discloses a hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance, which improves the corrosion resistance of the steel plate or the steel strip and avoids cracking of the substrate. The above steel plate or steel strip includes the following components in percentage by wt.: C 0.1-0.8%, Si 0.05-2.0%, Mn 0.5-3.0%, P <0.1%, S <0.05%, Al <0.1%, N <0.01%, and balance of Fe and impurities, and also includes at least one of Cr 0.01-1.0%, Mo 0.01-1.0%, Ti <0.2%, Nb 0.01-0.08%, V 0.01-1.0%, and B 0.005-0.08%; the zinc-based coating includes the following components in percentage by wt.: Al 0.15%-6.5%, Mg 0.2-7%, RE <0.2%, Sr 0.002-0.2%, and balance of Zn and impurities, and the coating further includes at least one or more of Mn, Cr, Al, and Mg, and the total amt. thereof is more than 0.1%.

IT 2293976-55-1, Aluminum 0-0.1, boron 0.005-0.1, carbon 0.1-0.8, chromium 0.01-1, iron bal., manganese 0.5-3, molybdenum 0.01-1, niobium 0.01-0.1, phosphorus 0-0.1, silicon 0.05-2, titanium 0-0.2, vanadium 0.01-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)

RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5

B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0

IPCI B21D0022-02; C23C0002-06; C23C0002-40; C22C0018-00; C21D0008-02
IPCR B21D0022-02 [I]; C21D0008-02 [I]; C22C0018-00 [I]; C23C0002-06 [I]; C23C0002-40 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST corrosion resistance zinc alloy coating steel hot stamping
IT Anticorrosive coating materials
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT Metalworking
(stamping, hot; Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2293976-55-1, Aluminum 0-0.1, boron 0.005-0.1, carbon 0.1-0.8, chromium 0.01-1, iron bal., manganese 0.5-3, molybdenum 0.01-1, niobium 0.01-0.1, phosphorus 0-0.1, silicon 0.05-2, titanium 0-0.2, vanadium 0.01-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2226545-76-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 34 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:269683 CAPLUS Full-text
DOCUMENT NUMBER: 170:345639
TITLE: 20CrNiB steel for carburized gear
INVENTOR(S): Sun, Hongping; Cao, Hongfu; Huang, Zhen; Xu, Xiaohong; Lu, Mingxia; Dou, Shengtao; Yang, Gaocheng; Zhang, Xuecheng
PATENT ASSIGNEE(S): Jiangyin Xingcheng Special Steel Works Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 7pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109321712	A	20190212	CN 2018-11322890	20181108

PRIORITY APPLN. INFO.: CN 2018-11322890 20181108
AB A 20CrNiB steel for carburized gear has the advantages of high hardenability, high strength and toughness, and stability. The 20CrNiB steel for the carburized gear includes the following raw materials by mass percentages: C: 0.17-0.23%, Si: < 0.35%, Mn: 0.50-0.95%, Cr: 0.85-1.25%, S: 0.015-0.030%, P :≤ 0.025%, Ni: 0.15-0.25%, Nb: 0.015-0.035%, B: 0.0010-0.0030%, Cu: < 0.20%, Al: 0.010-0.050%, Ca: ≤ 0.0005%, and balance of Fe.
IT 12742-15-3, 20CrNiB
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(20CrNiB steel for carburized gear)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0

Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

IPCI C21C0007-06; C21C0007-10; C21D0008-06; C22C0033-04; C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-42; C22C0038-48; C22C0038-54
IPCR C21C0007-06 [I]; C21C0007-10 [I]; C21D0008-06 [I]; C22C0033-04 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-42 [I]; C22C0038-48 [I]; C22C0038-54 [I]
CC 55-7 (Ferrous Metals and Alloys)
ST high hardenability carburization gear 20CrNiB steel
IT Carburizing
Gears
(20CrNiB steel for carburized gear)
IT 12742-15-3, 20CrNiB
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(20CrNiB steel for carburized gear)

L12 ANSWER 35 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:186187 CAPLUS Full-text
DOCUMENT NUMBER: 170:322160
TITLE: Alloy steel material with high-temperature oxidation resistance
INVENTOR(S): Duanmu, Shundi
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109280856	A	20190129	CN 2017-10636887	20170720

PRIORITY APPLN. INFO.: CN 2017-10636887 20170720
AB The title alloy steel material comprises (by wt.%): nickel 0.30-0.50, manganese 0.80-1.40, silicon 0.20-0.34, carbon 0.14-0.18, boron 0.02-0.06, phosphorus 0.01-0.02, sulfur 0.015-0.025, chromium 0.08-0.1, vanadium 0.06-0.2, copper 0.2-0.3, molybdenum 0.02-0.08, titanium 0.08-0.1, niobium 0.02-0.04, rubidium 0.06-0.2, thorium 0.08-0.1, lanthanum and germanium 0.06-0.1, and iron as balance, wherein the content of germanium is 2-4 times of that of lanthanum. The alloy steel material has excellent high-temp. oxidn. resistance, can be used for manufg. workpiece with high high-temp. oxidn. resistance, and the high-temp. oxidn. resistance of the alloy steel material is related to the content ratio of germanium and lanthanum in the alloy steel.
IT 1960401-15-3, Boron 0.02-0.1, carbon 0.1-0.2, chromium 0.1, copper 0.2-0.3, iron bal., lanthanum 0-0.1, germanium 0-0.1, manganese 0.8-1.4, molybdenum 0.02-0.1, nickel 0.3-0.5, rubidium 0.1-0.2, silicon 0.2-0.3, titanium 0.1, thorium 0.1, vanadium 0.1-0.2
RL: TEM (Technical or engineered material use); USES (Uses)
(alloy steel material with high-temp. oxidn. resistance)
RN 1960401-15-3 CAPLUS
CN Iron alloy, base, Fe 96-98,Mn 0.8-1.4,Ni 0.3-0.5,Cu 0.2-0.3,Si 0.2-0.3,C 0.1-0.2,Rb 0.1-0.2,V 0.1-0.2,Cr 0.1,Th 0.1,Ti 0.1,B 0-0.1,Ge 0-0.1,La 0-0.1,Mo 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6

Mn	0.8	-	1.4	7439-96-5
Ni	0.3	-	0.5	7440-02-0
Cu	0.2	-	0.3	7440-50-8
Si	0.2	-	0.3	7440-21-3
C	0.1	-	0.2	7440-44-0
Rb	0.1	-	0.2	7440-17-7
V	0.1	-	0.2	7440-62-2
Cr		0.1		7440-47-3
Th		0.1		7440-29-1
Ti		0.1		7440-32-6
B	0	-	0.1	7440-42-8
Ge	0	-	0.1	7440-56-4
La	0	-	0.1	7439-91-0
Mo	0	-	0.1	7439-98-7

IPCI C22C0038-04; C22C0038-02; C22C0038-54; C22C0038-46; C22C0038-42; C22C0038-44; C22C0038-48; C22C0038-50
IPCR C22C0038-04 [I]; C22C0038-02 [I]; C22C0038-42 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-54 [I]
CC 55-12 (Ferrous Metals and Alloys)
ST germanium lanthanum steel oxidn resistance
IT 1960401-15-3, Boron 0.02-0.1, carbon 0.1-0.2, chromium 0.1, copper 0.2-0.3, iron bal., lanthanum 0-0.1, germanium 0-0.1, manganese 0.8-1.4, molybdenum 0.02-0.1, nickel 0.3-0.5, rubidium 0.1-0.2, silicon 0.2-0.3, titanium 0.1, thorium 0.1, vanadium 0.1-0.2
RL: TEM (Technical or engineered material use); USES (Uses)
(alloy steel material with high-temp. oxidn. resistance)

L12 ANSWER 36 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2601319 CAPLUS Full-text
DOCUMENT NUMBER: 170:116258
TITLE: Method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating
INVENTOR(S): Rosenstock, Dirk; Banik, Janko
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany; ThyssenKrupp AG
SOURCE: PCT Int. Appl., 25pp.; Chemical Indexing Equivalent to 170:116256 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018234102	A1	20181227	WO 2018-EP65498	20180612
DE 102017210201	A1	20181220	DE 2017-102017210201	20170619
EP 3642371	A1	20200429	EP 2018-738199	20180612
PRIORITY APPLN. INFO.:			DE 2017-102017210201 A	20170619
			WO 2018-EP65498 W	20180612

AB A method is described for producing a corrosion-resistant steel automotive component comprising a substrate and an anticorrosive coating.
IT 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
RN 2254829-63-3 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8

Nb 0 - 0.1 7440-03-1
P 0 - 0.1 7723-14-0

IPCI C21D0008-02 [I]; C23C0002-12 [I]; C21D0009-46 [I]; C21D0001-673 [I]; B32B0015-01 [I]
IPCR C21D0008-02 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0009-46 [I]; C23C0002-12 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel automobile metal coating corrosion aluminum alloy
IT Anticorrosive coating materials
(metallic; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT Automobile bodies
Automobile doors
Automobile roofs
Automotive bumpers
Heat treatment
(method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 254455-65-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 870820-47-6P, 22MnB5 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 37 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2596372 CAPLUS Full-text
DOCUMENT NUMBER: 170:106297
TITLE: High-strength steel sheet and its manufacture for automobile parts
INVENTOR(S): Natsumeda, Hirokazu; Murakami, Toshio; Saito, Kenji; Murata, Tadao
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.; Chemical Indexing Equivalent to 170:68139 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018204058	A	20181227	JP 2017-108340	20170531
WO 2018221307	A1	20181206	WO 2018-JP19594	20180522
KR 2020003010	A	20200108	KR 2019-7034838	20180522
CN 110678569	A	20200110	CN 2018-80035460	20180522
EP 3636788	A1	20200415	EP 2018-809088	20180522
IN 201947048601	A	20191206	IN 2019-47048601	20191127
US 20200190619	A1	20200618	US 2019-16617736	20191127

PRIORITY APPLN. INFO.: JP 2017-108340 A 20170531
WO 2018-JP19594 W 20180522
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The high-strength steel sheet comprises the following compn. in mass%: carbon of 0.15-0.35, silicon of 0.5-3, aluminum of 0.01, nitrogen of 0-0.01, manganese of 1-4, phosphorus of 0-0.05, sulfur of 0-0.01, and remaining made up of iron and unavoidable impurities. The steel structure having a ferrite fraction of 0-5%, the total fraction of tempered martensite and bainite is 60% or more, the amt. of retained austenite is 10% or more, the av. size of martensite and austenite(MA) is 0-1 μm and retained austenite is 0-1 μm, wherein the retained austenite having a size of 1.5 μm or more is 2% or more of the total retained austenite amt., and a solid soln. nitrogen content of 0-0.002 mass%.

IT 2253797-76-9P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)
RN 2253797-76-9 CAPLUS
CN Iron alloy, base, Fe 84-99,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zn 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	84	-	99	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.2	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zn	0	-	0.2	7440-66-6

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-48 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet manuf automobile part
IT Annealing
Automobile parts
Cold rolling
Elongation, mechanical
Heat treatment
Hot rolling
Microstructure
Sheet materials
Tensile strength
Yield strength
(high-strength steel sheet and its manuf. for automobile parts)
IT 2253797-76-9P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)

L12 ANSWER 38 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2596261 CAPLUS Full-text
DOCUMENT NUMBER: 170:127894
TITLE: Wear-resistant thick steel sheet
INVENTOR(S): Fujioka, Masaaki; Namekawa, Tetsuya; Yoshimura, Masahide; Minagawa, Masaki; Hoshino, Manabu; Sawamura, Mitsuru
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018204109	A	20181227	JP 2018-110217	20180608

PRIORITY APPLN. INFO.: JP 2017-113421 A 20170608
AB The title wear-resistant thick steel sheet is excellent in both abrasion

resistance and toughness. The steel sheet comprises (by mass%): carbon 0.2-1.6, silicon 0.01-2, manganese 2.5-30, aluminum 0.001-0.3, phosphorus 0-0.05, sulfur 0-0.05, and iron and impurities as bal., wherein the content (mass%) of carbon and manganese satisfies (-13.75)C + 16.5 ≤ Mn ≤ (-20)C + 35.

IT 2257425-86-6
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(wear-resistant thick steel sheet)

RN 2257425-86-6 CAPLUS

CN Iron alloy, base, Fe 45-97,Mn 2.5-30,Cr 0-5,Co 0-3,Cu 0-3,Ni 0-3,Mo 0-2,Si 0-2,W 0-2,C 0.2-1.6,N 0-1,Al 0-0.3,B 0-0.3,Nb 0-0.3,Ta 0-0.3,Ti 0-0.3,V 0-0.3,Zr 0-0.3 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	45 - 97	7439-89-6
Mn	2.5 - 30	7439-96-5
Cr	0 - 5	7440-47-3
Co	0 - 3	7440-48-4
Cu	0 - 3	7440-50-8
Ni	0 - 3	7440-02-0
Mo	0 - 2	7439-98-7
Si	0 - 2	7440-21-3
W	0 - 2	7440-33-7
C	0.2 - 1.6	7440-44-0
N	0 - 1	17778-88-0
Al	0 - 0.3	7429-90-5
B	0 - 0.3	7440-42-8
Nb	0 - 0.3	7440-03-1
Ta	0 - 0.3	7440-25-7
Ti	0 - 0.3	7440-32-6
V	0 - 0.3	7440-62-2
Zr	0 - 0.3	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0008-02 [I]
IPCR C22C0038-00 [I]; C21D0008-02 [I]; C22C0038-60 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST wear resistant steel sheet
IT Wear-resistant materials
(wear-resistant thick steel sheet)

IT 12244-31-4, Austenite, formation (nonpreparative)
RL: FMU (Formation, unclassified); OCU (Occurrence, unclassified); FORM (Formation, nonpreparative); OCCU (Occurrence)
(wear-resistant thick steel sheet)

IT 2257425-86-6
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(wear-resistant thick steel sheet)

L12 ANSWER 39 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2544202 CAPLUS Full-text
DOCUMENT NUMBER: 170:116256
TITLE: Method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating
INVENTOR(S): Rosenstock, Dirk; Banik, Janko
PATENT ASSIGNEE(S): ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE: Ger. Offen., 16pp.; Chemical Indexing Equivalent to 170:116258 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017210201	A1	20181220	DE 2017-102017210201	20170619
CN 109136775	A	20190104	CN 2017-10986828	20171020
WO 2018234102	A1	20181227	WO 2018-EP65498	20180612
EP 3642371	A1	20200429	EP 2018-738199	20180612

PRIORITY APPLN. INFO.: DE 2017-102017210201 A 20170619
WO 2018-EP65498 W 20180612

AB A method is described for producing a corrosion-resistant steel automotive component comprising a substrate and an anticorrosive coating.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102007061489 A1	CAPLUS
Anon				DE 102009007909 A1	CAPLUS
Anon				WO 2015036151 A1	CAPLUS
Anon				WO 2016034476 A1	CAPLUS

IT 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)

RN 2254829-63-3 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI C22C0038-04 [I]; C21D0008-02 [I]; C23C0002-12 [I]
IPCR C22C0038-04 [I]; C21D0008-02 [I]; C23C0002-12 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel automobile metal coating corrosion aluminum alloy
IT Anticorrosive coating materials
(metallic; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT Automobile bodies
Automobile doors
Automobile roofs
Automotive bumpers
Heat treatment
(method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 254455-65-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 870820-47-6P, 22MnB5 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 40 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2476841 CAPLUS Full-text
DOCUMENT NUMBER: 170:49883
TITLE: High-strength steel sheet comprising silicon and manganese, and production method for same
INVENTOR(S): Natsumeda, Hirokazu; Murakami, Toshio; Saito, Kenji; Murata, Tadao
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.; Chemical Indexing Equivalent to 170:35129 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018197380	A	20181213	JP 2017-103024	20170524
WO 2018216522	A1	20181129	WO 2018-JP18489	20180514
KR 2019142354	A	20191226	KR 2019-7033765	20180514
CN 110651062	A	20200103	CN 2018-80033477	20180514
EP 3633058	A1	20200408	EP 2018-806482	20180514
IN 201947047461	A	20191129	IN 2019-47047461	20191121
US 20200071787	A1	20200305	US 2019-16615462	20191121

PRIORITY APPLN. INFO.: JP 2017-103024 A 20170524
WO 2018-JP18489 W 20180514
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The high-strength steel sheet comprises the following compn. by mass %: carbon of 0.15-0.35, silicon of 0.5-3, aluminum of 0.5-3, manganese of 1-4, phosphorus of 0.05, sulfur of 0.01, titanium of 0.01-0.2, with the remainder being made up of iron balance and unavoidable impurities. The steel sheet structure is such that the ferrite fraction does not exceed 5, the total fraction of tempered martensite and tempered bainite is at least 60, the retained austenite fraction is at least 10, the fresh martensite fraction does not exceed 5, the av. particle size of retained austenite does not exceed 0.5 μm, retained austenite having a particle diam. of at least 1.0 μm accounts for at least 2 of total retained austenite content, and prior austenite particle diam. does not exceed 10 μm.
IT 2252460-30-1
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)
RN 2252460-30-1 CAPLUS
CN Iron alloy, base, Fe 88-98,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	88 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Al	0 - 3	7429-90-5
Si	0 - 3	7440-21-3
B	0 - 1	7440-42-8
Cr	0 - 1	7440-47-3
Cu	0 - 1	7440-50-8
Ni	0 - 1	7440-02-0
C	0.2 - 0.4	7440-44-0
Hf	0 - 0.2	7440-58-6
Mo	0 - 0.2	7439-98-7
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
Zr	0 - 0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-14 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C21D0009-48 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C22C0038-14 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet
IT Deep drawing of materials
Elongation, mechanical
Grain size
Heat treatment
Impact strength
Microstructure

Rolling (metals)
Tensile strength
Yield strength
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)

IT 12173-93-2, Martensite, formation (nonpreparative) 12244-31-4, Austenite, formation (nonpreparative) 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)

IT 2252460-30-1
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)

L12 ANSWER 41 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2421261 CAPLUS Full-text
DOCUMENT NUMBER: 170:106245
TITLE: Ultra-high strength steel having near net shaping for automobile safety components and preparation method thereof
INVENTOR(S): Ju, Jia; Wang, Zhangzhong; Zhang, Sibin; Liu, Zhuang; Zhang, Baosen; Mao, Xiangyang; Ba, Zhixin; Li, Xuan; Li, Huaguan
PATENT ASSIGNEE(S): Nanjing Institute of Technology, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 108950411	A	20181207	CN 2018-10840230	20180727
CN 108950411	B	20200519		
PRIORITY APPLN. INFO.:			CN 2018-10840230	20180727

AB Raw materials include the following compns. (by wt.%): C 0.15-0.25, Mn 1.3-2.8, P ≤0.006, S ≤0.004, Si 0.25-0.85, B 0.001-0.07, Cr 0.20-0.90, Ti 0.07-0.15, Al 0.005-0.02, Nb 0.65-1.40, and Fe as balance. The prepn. method includes the following steps of S1) formulating; S2) subjecting to vacuum induction melting, casting to form alloy ingot; S3) thermally treating; and S4) pressure processing. The product has the advantages of relatively excellent mech. property and near-net forming.

IT 2254705-29-6P, Boron 0-0.1, Carbon 0.2, chromium 0.2-0.9, iron 94-97, manganese 1.3-2.8, niobium 0.6-1.4, silicon 0.2-0.8, titanium 0.1-0.2
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(ultra-high strength steel having near net shaping for automobile safety components and prepn. method thereof)

RN 2254705-29-6 CAPLUS
CN Iron alloy, base, Fe 94-97,Mn 1.3-2.8,Nb 0.6-1.4,Cr 0.2-0.9,Si 0.2-0.8,C 0.2,Ti 0.1-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 97	7439-89-6
Mn	1.3 - 2.8	7439-96-5
Nb	0.6 - 1.4	7440-03-1
Cr	0.2 - 0.9	7440-47-3
Si	0.2 - 0.8	7440-21-3
C	0.2	7440-44-0
Ti	0.1 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8

IPCI C22C0038-04; C22C0038-02; C22C0038-32; C22C0038-28; C22C0038-26; C22C0038-06; C22C0038-38; C22C0033-04; C21D0008-00

IPCR C22C0038-04 [I]; C21D0008-00 [I]; C22C0033-04 [I]; C22C0038-02 [I];
C22C0038-06 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I];
C22C0038-38 [I]
CC 55-1 (Ferrous Metals and Alloys)
Section cross-reference(s): 47
ST ultrahigh strength steel near net shaping automobile safety component
IT Heat treatment
Magnetic stirring
Melting
Pipes and Tubes
(ultra-high strength steel having near net shaping for
automobile safety components and prepn. method thereof)
IT 2254705-29-6P, Boron 0-0.1, Carbon 0.2, chromium 0.2-0.9, iron
94-97, manganese 1.3-2.8, niobium 0.6-1.4, silicon 0.2-0.8, titanium
0.1-0.2
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
process); TEM (Technical or engineered material use); PREP (Preparation);
PROC (Process); USES (Uses)
(ultra-high strength steel having near net shaping for
automobile safety components and prepn. method thereof)

L12 ANSWER 42 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2401537 CAPLUS Full-text
DOCUMENT NUMBER: 170:68139
TITLE: High-strength steel sheet and its manufacture for
automobile parts
INVENTOR(S): Natsumeda, Hirokazu; Murakami, Toshio; Saito, Kenji;
Murata, Tadao
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.),
Japan
SOURCE: PCT Int. Appl., 42pp.; Chemical Indexing Equivalent to
170:106297 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018221307	A1	20181206	WO 2018-JP19594	20180522
JP 2018204058	A	20181227	JP 2017-108340	20170531
KR 2020003010	A	20200108	KR 2019-7034838	20180522
CN 110678569	A	20200110	CN 2018-80035460	20180522
EP 3636788	A1	20200415	EP 2018-809088	20180522
IN 201947048601	A	20191206	IN 2019-47048601	20191127
US 20200190619	A1	20200618	US 2019-16617736	20191127

PRIORITY APPLN. INFO.: JP 2017-108340 A 20170531
WO 2018-JP19594 W 20180522
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The high-strength steel sheet comprises the following compn. in mass%:
carbon of 0.15-0.35, silicon of 0.5-3, aluminum of 0.01, nitrogen of
0-0.01, manganese of 1-4, phosphorus of 0-0.05, sulfur of 0-0.01, and
remaining made up of iron and unavoidable impurities. The steel
structure having a ferrite fraction of 0-5%, the total fraction of
tempered martensite and bainite is 60% or more, the amt. of retained
austenite is 10% or more, the av. size of martensite and austenite(MA) is
0-1 μm and retained austenite is 0-1 μm, wherein the retained
austenite having a size of 1.5 μm or more is 2% or more of the total
retained austenite amt., and a solid soln. nitrogen content of 0-0.002
mass%.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1991			JP 394017 A	
Anon	2015			JP 2015516511 A	
MURAKAMI TOSHIO	2013			JP 2013040383 A	CAPLUS
MURAKAMI TOSHIO	2017			JP 2017214648 A	CAPLUS
MURATA TADAO	2016			JP 2016194138 A	CAPLUS
NAKAGAITO TATSUYA	2009			JP 2009209450 A	CAPLUS

IT 2253797-76-9P, Aluminum 0-3, boron 0-1, carbon 0.15-0.35,

chromium 0-1, copper 0-1, hafnium 0-0.2, iron bal., manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, silicon 0-3, titanium 0-0.2, vanadium 0-0.2, Zn 0-0.2
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)
RN 2253797-76-9 CAPLUS
CN Iron alloy, base, Fe 84-99,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zn 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	84	-	99	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.2	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zn	0	-	0.2	7440-66-6

IPCI C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C21D0009-48 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet manuf automobile part
IT Annealing
Automobile parts
Cold rolling
Elongation, mechanical
Heat treatment
Hot rolling
Microstructure
Sheet materials
Tensile strength
Yield strength
(high-strength steel sheet and its manuf. for automobile parts)
IT 2253797-76-9P, Aluminum 0-3, boron 0-1, carbon 0.15-0.35, chromium 0-1, copper 0-1, hafnium 0-0.2, iron bal., manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, silicon 0-3, titanium 0-0.2, vanadium 0-0.2, Zn 0-0.2
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)

L12 ANSWER 43 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2338703 CAPLUS Full-text
DOCUMENT NUMBER: 170:35129
TITLE: High-strength steel sheet comprising silicon and manganese, and production method for same
INVENTOR(S): Natsumeda, Hirokazu; Murakami, Toshio; Saito, Kenji; Murata, Tadao
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 41pp.; Chemical Indexing Equivalent to 170:49883 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent

LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018216522	A1	20181129	WO 2018-JP18489	20180514
JP 2018197380	A	20181213	JP 2017-103024	20170524
KR 2019142354	A	20191226	KR 2019-7033765	20180514
CN 110651062	A	20200103	CN 2018-80033477	20180514
EP 3633058	A1	20200408	EP 2018-806482	20180514
IN 201947047461	A	20191129	IN 2019-47047461	20191121
US 20200071787	A1	20200305	US 2019-16615462	20191121

PRIORITY APPLN. INFO.: JP 2017-103024 A 20170524
WO 2018-JP18489 W 20180514
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The high-strength steel sheet comprises the following compn. by mass %: carbon of 0.15-0.35, silicon of 0.5-3, aluminum of 0.5-3, manganese of 1-4, phosphorus of 0.05, sulfur of 0.01, titanium of 0.01-0.2, with the remainder being made up of iron balance and unavoidable impurities. The steel sheet structure is such that the ferrite fraction does not exceed 5, the total fraction of tempered martensite and tempered bainite is at least 60, the retained austenite fraction is at least 10, the fresh martensite fraction does not exceed 5, the av. particle size of retained austenite does not exceed 0.5 μm, retained austenite having a particle diam. of at least 1.0 μm accounts for at least 2 of total retained austenite content, and prior austenite particle diam. does not exceed 10 μm.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
KAWATA HIROYUKI	2017			WO 2017164346 A1	CAPLUS
MURAKAMI TOSHIO	2017			JP 2017214648 A	CAPLUS
SANO KOICHI	2017			JP 2017053001 A	CAPLUS
SHIBATA KOSUKE	2015			JP 2015218365 A	CAPLUS

IT 2252460-30-1, Aluminum 0-3, boron 0-1, calcium 0-0.01, carbon 0.15-0.35, chromium 0-1, copper 0-1, hafnium 0-0.2, iron bal., magnesium 0-0.01, manganese 1-4, molybdenum 0-0.2, nickel 0-1, niobium 0-0.2, phosphorus 0-0.05, mis 0-0.01, silicon 0-3, sulfur 0-0.01, titanium 0.01-0.2, vanadium 0-0.2, zirconium 0-0.2
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)
RN 2252460-30-1 CAPLUS
CN Iron alloy, base, Fe 88-98,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	88 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Al	0 - 3	7429-90-5
Si	0 - 3	7440-21-3
B	0 - 1	7440-42-8
Cr	0 - 1	7440-47-3
Cu	0 - 1	7440-50-8
Ni	0 - 1	7440-02-0
C	0.2 - 0.4	7440-44-0
Hf	0 - 0.2	7440-58-6
Mo	0 - 0.2	7439-98-7
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
Zr	0 - 0.2	7440-67-7

IPCI C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-14 [I]; C22C0038-58 [I]
IPCR C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-14 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet

IT Deep drawing of materials
Elongation, mechanical
Grain size
Heat treatment
Impact strength
Microstructure
Rolling (metals)
Tensile strength
Yield strength
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)
IT 12173-93-2, Martensite, formation (nonpreparative) 12244-31-4, Austenite, formation (nonpreparative) 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)
IT 2252460-30-1, Aluminum 0-3, boron 0-1, calcium 0-0.01, carbon 0.15-0.35, chromium 0-1, copper 0-1, hafnium 0-0.2, iron bal., magnesium 0-0.01, manganese 1-4, molybdenum 0-0.2, nickel 0-1, niobium 0-0.2, phosphorus 0-0.05, mis 0-0.01, silicon 0-3, sulfur 0-0.01, titanium 0.01-0.2, vanadium 0-0.2, zirconium 0-0.2
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(high-strength steel sheet comprising silicon and manganese, and prodn. method for same)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 44 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2321302 CAPLUS Full-text
DOCUMENT NUMBER: 170:49880
TITLE: Steel-based electromagnetic shield multilayer screen products
INVENTOR(S): Wieschalla, Vanessa; Nierhoff, Daniel; Wolske, Vanessa; Becker, Jens-Ulrik
PATENT ASSIGNEE(S): ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE: Ger., 17pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017216975	B3	20181129	DE 2017-102017216975	20170925
WO 2019057547	A1	20190328	WO 2018-EP74424	20180911

PRIORITY APPLN. INFO.: DE 2017-102017216975 A 20170925
AB An electromagnetic radiation shielding multilayer material is manufd. for shielding from electromagnetic radiation, static elec. and/or static magnetic fields.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				EP 1426982 A1	CAPLUS
Anon				WO 1991012960 A1	
Anon				DE 3710322 A1	CAPLUS

IT 2253656-70-9P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(layers; steel-based electromagnetic shield multilayer screen products)
RN 2253656-70-9 CAPLUS
CN Iron alloy, base, Fe 94-100,Mn 0.1-3,C 0-0.5,Cr 0-0.5,Cu 0-0.5,Si 0-0.5,Ti 0-0.3,Ni 0-0.2,Al 0-0.1,As 0-0.1,B 0-0.1,Mo 0-0.1,N 0-0.1,Nb 0-0.1,P 0-0.1,S 0-0.1,Sn 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	94	-	100	7439-89-6
Mn	0.1	-	3	7439-96-5
C	0	-	0.5	7440-44-0
Cr	0	-	0.5	7440-47-3
Cu	0	-	0.5	7440-50-8
Si	0	-	0.5	7440-21-3
Ti	0	-	0.3	7440-32-6
Ni	0	-	0.2	7440-02-0
Al	0	-	0.1	7429-90-5
As	0	-	0.1	7440-38-2
B	0	-	0.1	7440-42-8
Mo	0	-	0.1	7439-98-7
N	0	-	0.1	17778-88-0
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0
S	0	-	0.1	7704-34-9
Sn	0	-	0.1	7440-31-5
V	0	-	0.1	7440-62-2

IPCI C22C0038-02 [I]; H05K0009-00 [I]; C22C0038-04 [I]; C22C0038-18 [I]
IPCR C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]; H05K0009-00 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 73, 76, 77
ST multilayer screen electromagnetic shield stainless steel alloy
IT Electromagnetic shields
Hot rolling
Multilayers
(steel-based electromagnetic shield multilayer screen products)
IT 2253656-70-9P 2253656-71-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(layers; steel-based electromagnetic shield multilayer screen products)

L12 ANSWER 45 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1991052 CAPLUS Full-text
DOCUMENT NUMBER: 169:495435
TITLE: Preparation method of high-strength steel with fatigue stress amplitude of ≥400mpa
INVENTOR(S): Wang, Shisen; Du, Ming; Xu, Jinqiao; Wang, Rong; Li, Defa; Xiong, Fei; He, Yayuan; Yin, Yunyang
PATENT ASSIGNEE(S): Wuhan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 108707822	A	20181026	CN 2018-10541993	20180530
CN 108707822	B	20200505		

PRIORITY APPLN. INFO.: CN 2018-10541993 20180530
AB The title steel comprises (by wt%) carbon 0.1-0.2, silicon 0.1-0.4, manganese 1.2-1.6, phosphorus+sulfur 0-0.015, chromium 0.1-0.4, molybdenum 0.4-0.8, nickel 0.05-0.2, niobium +titanium+vanadium+boron 0.045-0.1, iron balance. The steel is prepd. by smelting, continuous casting, hot rolling, quenching at 850-920°C, tempering at 380-420°C, and cooling. The steel has higher strength and elongation.
IT 2248486-84-0P, Carbon 0.1-0.2, boron 0-0.1, chromium 0.1-0.4, manganese 1.2-1.6, molybdenum 0.4-0.8, nickel 0.05-0.2, niobium 0-0.1, silicon 0.1-0.4, titanium 0-0.1, vanadium 0-0.1, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(prepn. method of high-strength steel with fatigue stress amplitude of ≥400mpa)
RN 2248486-84-0 CAPLUS
CN Iron alloy, base, Fe 96-98,Mn 1.2-1.6,Mo 0.4-0.8,Cr 0.1-0.4,Si 0.1-0.4,C 0.1-0.2,Ni 0-0.2,B 0-0.1,Nb 0-0.1,Ti 0-0.1,V 0-0.1 (CA INDEX NAME)

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Mn	1.2	-	1.6	7439-96-5
Mo	0.4	-	0.8	7439-98-7
Cr	0.1	-	0.4	7440-47-3
Si	0.1	-	0.4	7440-21-3
C	0.1	-	0.2	7440-44-0
Ni	0	-	0.2	7440-02-0
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
Ti	0	-	0.1	7440-32-6
V	0	-	0.1	7440-62-2

IPCI C22C0038-02; C22C0038-04; C22C0038-44; C22C0038-46; C22C0038-48; C22C0038-50; C22C0038-54; C21D0006-00; C21D0008-02
IPCR C22C0038-02 [I]; C21D0006-00 [I]; C21D0008-02 [I]; C22C0038-04 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-54 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel strength
IT Casting of metals
(continuous; prepn. method of high-strength steel with fatigue stress amplitude of ≥400mpa)
IT Hot rolling
Quenching (cooling)
Tempering
(prepn. method of high-strength steel with fatigue stress amplitude of ≥400mpa)
IT 2248486-84-0P, Carbon 0.1-0.2, boron 0-0.1, chromium 0.1-0.4, manganese 1.2-1.6, molybdenum 0.4-0.8, nickel 0.05-0.2, niobium 0-0.1, silicon 0.1-0.4, titanium 0-0.1, vanadium 0-0.1, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(prepn. method of high-strength steel with fatigue stress amplitude of ≥400mpa)

L12 ANSWER 46 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1950769 CAPLUS Full-text
DOCUMENT NUMBER: 169:495369
TITLE: Microstructural features and corrosion analysis of A517 steel joint processed by friction stir welding
AUTHOR(S): Ansaripour, Morteza; Soltanipour, Abdol Reza; Dehnavi, Mohamad Reza
CORPORATE SOURCE: Materials Engineering Department, Malek Ashtar University of Technology, Shahin Shahr, Iran
SOURCE: Materials Research Express (2018), 5(6), 066543/1-066543/13
CODEN: MREAC3; ISSN: 2053-1591
DIGITAL OBJECT ID: 10.1088/2053-1591/aacc80
PUBLISHER: IOP Publishing Ltd.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB Microstructural observations of friction stir welds of A517 (B) steel showed that within the range of welding variables, martensite phase was hindered. Stir zone microstructure displayed coarse-grained upper bainite assocd. with granular bainite. HAZ consisted of decompd. bainite morphol. of lath-like and equiaxed. Electron backscatter diffraction anal. showed a random oriented recrystd. grain. The corrosion behavior in 3.5 wt% NaCl soln. revealed neg. shift of corrosion potential with increasing of traverse speed. However, the effect of welding parameters on cathodic behavior was more predominant than that on anodic behavior; assocd. with the microstructural alterations. Pitting of corrosion rust layer was identified as the main mechanism of corrosion attack in base material and welds. Although, corrosion c.d. of weld in all of the applied welding condition was slightly lower than that in the base material, however, this study provides recommendation for application of A517 steel jointed by friction stir welding in marine environment.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bhadeshia, H	1999	A273-	58	Mater Sci Eng	CAPLUS
Casalino, G	2012		8239	Proc of SPIE-The Int	
Casalino, G	2014		8963	Proc of SPIE-The Int	
Chen, Y	2005	398	47	Mater Sci Eng A	
Choi, Y	2005	391	162	J Alloys Compd	CAPLUS
Cui, H	2016	681	426	J of Alloys and Comp	CAPLUS
Gao, K	2010	52	3428	Corros Sci	CAPLUS
Ghosh, M	2013	22	3890	J Mater Eng Perform	CAPLUS
Huang, H	1994	36	1027	Corros Sci	CAPLUS
Lee, W	2004	58	1041	Mater Lett	CAPLUS
Li, L	2012	7	3773	Int J Electrochem Sc	CAPLUS
Lu, B	2009	57	41	Acta Mater	CAPLUS
Manvatkar, V	2015	94	36	Scr Mater	CAPLUS
Medina, G	2016	21	146	Soldagem & Inspecao	
Meshram, S	2017	25	94	Journal of Manufactu	
Mishra, R	2005	50	1	Mater Sci Eng R	
Nelson, T	2016	231	66	Mater Process Techno	CAPLUS
Park, H	2004	371A	160	Mater Sci Eng	
Paul, C	2015	10	10246	Int J Electrochem Sc	
Ramirez, A	2013		75	Proc of the 1st Int	
Ren, R	2012	85	283	Electrochemica Acta	CAPLUS
Sato, Y	2005	53	637	Acta Mater	CAPLUS
Sato, Y	2001	32A	3033	Metall Mater Trans	CAPLUS
Sherif, E	2015	10	34	Int J Electrochem Sc	CAPLUS
Sherif, E	2011	129	961	Mater Chem Phy	CAPLUS
Sutton, M	2003	70	2215	Eng Fract Mech	
Sutton, M	2003	354A	6	Mater Sci Eng	
Wang, H	2015	10	5827	Int J Electrochem Sc	CAPLUS
Wang, X	2014	9	4574	Int J Electrochem Sc	
Wang, X	2014	21	474	J Nat Gas Sci Eng	CAPLUS
Wert, J	2003	49	607	Scr Mater	CAPLUS
Yan, J	2005	10	725	Sci Tech Weld Joinin	CAPLUS
Zajac, S	2005		387	Proc of the Int Conf	CAPLUS
Zhang, Q	2002	77	603	Mater Chem Phys	
Zhang, R	2010	41A	1448	Metall Mater Trans	CAPLUS
Zhang, S	2013	75	293	Corros Sci	CAPLUS

IT 52346-86-8, A517B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)
ST steel joint processed friction stir welding microstructural feature corrosion
IT Corrosion
Corrosion resistance
Current density
Electric current-potential relationship
Friction welding
Friction welds

Grain size
Microstructure
Recrystallization
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)

IT 12173-93-2, Martensite, formation (nonpreparative) 12427-23-5, Bainite
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)

IT 52346-86-8, A517B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)

L12 ANSWER 47 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1916470 CAPLUS Full-text
DOCUMENT NUMBER: 169:454845
TITLE: Aluminum alloy plated electric resistance welded pipe for quenching and method of manufacturing aluminum plated hollow member
INVENTOR(S): Maki, Jun; Fujita, Soshi; Nakamura, Toyomitsu
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Tokkyo Koho, 23pp.
CODEN: JTXXFF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 6406475	B1	20181017	JP 2018-513042	20171120
WO 2019097729	A1	20190523	WO 2017-JP41697	20171120
CN 111247266	A	20200605	CN 2017-80096110	20171120
IN 202017014250	A	20200814	IN 2020-17014250	20200331
US 20200347489	A1	20201105	US 2020-16753961	20200406

PRIORITY APPLN. INFO.: WO 2017-JP41697 W 20171120
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The aluminum alloy plated elec. resistance welded pipe for quenching comprises a base material made of tubular steel plate and an elec. resistance welded part provided in abutting part of steel plate and extending in longitudinal direction. The base material comprises in mass%: carbon 0.06-0.5, silicon 0.01-0.8, manganese 0.6-3, phosphorous 0-0.05, sulfur 0-0.05, aluminum 0-0.1, oxygen 0-0.006, nitrogen 0-0.02, titanium 0.01-0.1, boron 0-0.1, niobium 0-0.1, vanadium 0-0.3, chromium 0-0.5, molybdenum 0-0.5, nickel 0-0.5, copper 0-0.5, calcium 0-0.005, rare earth metal 0-0.005, iron balance and impurities. The base material is positioned on the surface of steel sheet and has an intermetallic compd. layer contg. an aluminum-iron-silicon based intermetallic compd. and an aluminum plating layer located on the surface of the intermetallic compd. layer and contg. aluminum and silicon. The thickness of intermetallic compd. layer is X (μm), the thickness of aluminum layer is Y (μm), and when the thickness of steel pipe is t (mm) and outer diam. of steel pipe is D (mm), the following formula is satisfied: $70 \times X/D \leq Y/t \leq 30$. The method of manufg. aluminum plated hollow member comprises: positioning the base material on the surface of steel sheet, heating aluminum-plated elec. resistance welded pipe, forming the heated aluminum-plated elec. resistance welded pipe into desired shape, and rapidly cooling the aluminum plating elec. resistance welded pipe. According to the present invention, it is possible to manuf. high strength aluminum plated hollow member by hot working, and it is possible to obtain part that has reduced wt.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1983			JP 58204179 A	CAPLUS
Anon	2008			JP 2008069398 A	CAPLUS
Anon	2009			WO 2009131233 A1	CAPLUS
Anon	2014			JP 2014118628 A	CAPLUS
Anon	2017			JP 2017026147 A	CAPLUS

IT 2247299-93-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum alloy plated elec. resistance welded pipe for quenching and method of manufg. aluminum plated hollow member)
RN 2247299-93-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.6-3,Si 0-0.8,C 0.1-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Ni 0-0.5,V 0-0.3,Al 0-0.1,B 0-0.1,Nb 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.6	-	3	7439-96-5
Si	0	-	0.8	7440-21-3
C	0.1	-	0.5	7440-44-0
Cr	0	-	0.5	7440-47-3
Cu	0	-	0.5	7440-50-8
Mo	0	-	0.5	7439-98-7
Ni	0	-	0.5	7440-02-0
V	0	-	0.3	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
Ti	0	-	0.1	7440-32-6

IPCI C23C0002-28 [I]; C23C0002-12 [I]; C23C0002-40 [I]; C23C0002-26 [I]; C23C0028-00 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-08 [N]; C21D0001-18 [N]; C21D0009-50 [N]; C22C0021-00 [N]
IPCR C23C0002-28 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-40 [I]; C23C0028-00 [I]
CC 56-6 (Nonferrous Metals and Alloys)
IT 2247299-93-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum alloy plated elec. resistance welded pipe for quenching and method of manufg. aluminum plated hollow member)

L12 ANSWER 48 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1651585 CAPLUS Full-text
DOCUMENT NUMBER: 169:330484
TITLE: Method for producing a hot-formed coated steel product
INVENTOR(S): Beentjes, Petrus Cornelis Jozef; Van Schoonevelt, Hugo
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: PCT Int. Appl., 28pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2018158166	A1	20180907	WO 2018-EP54600		20180223
CA 3051002	A1	20180907	CA 2018-3051002		20180223
MX 2019010192	A	20191002	MX 2019-10192		20180223
CN 110352260	A	20191018	CN 2018-80014405		20180223
KR 2019124211	A	20191104	KR 2019-7023413		20180223
EP 3589772	A1	20200108	EP 2018-714700		20180223
JP 2020510755	T	20200409	JP 2019-546825		20180223
BR 112019015673	A2	20200707	BR 2019-112019015673		20180223
US 20200165712	A1	20200528	US 2019-16485606		20190813
IN 201947037974	A	20190927	IN 2019-47037974		20190920
PRIORITY APPLN. INFO.:			EP 2017-158418	A	20170228
			EP 2017-158419	A	20170228
			WO 2018-EP54600	W	20180223

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to an Al-Si-alloy coated steel strip for hot press forming and to a method for producing the Al-Si-alloy coated steel strip in a continuous coating process.
IT 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium

0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)
RN 2243499-83-2 CAPLUS
CN Iron alloy, base, Fe 79-100,Mn 0.4-4,Cr 0-4,Al 0-3,Si 0-3,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.5,V 0-0.5,W 0-0.5,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	79	-	100	7439-89-6
Mn	0.4	-	4	7439-96-5
Cr	0	-	4	7440-47-3
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Mo	0	-	1	7439-98-7
C	0	-	0.5	7440-44-0
V	0	-	0.5	7440-62-2
W	0	-	0.5	7440-33-7
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
IPCR C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
CC 56-7 (Nonferrous Metals and Alloys)
ST hot formed aluminum silicon alloy coated steel product prodn
IT Paints
(adhesion; method for producing hot-formed coated steel product)
IT Heating
(convective, prediffusion annealing; method for producing hot-formed coated steel product)
IT Aluminizing
(hot dip; method for producing hot-formed coated steel product)
IT Hot-dip coating process
(hot-dip aluminizing; method for producing hot-formed coated steel product)
IT Metal forming
(hot; method for producing hot-formed coated steel product)
IT Automobile bodies
Cooling
Cutting
Diffusion coating materials
Immersion coating process
Phase composition
Surface structure
Thickness
(method for producing hot-formed coated steel product)
IT Adhesion, physical
(paint; method for producing hot-formed coated steel product)
IT Induction heating
Radiant heating
(prediffusion annealing; method for producing hot-formed coated steel product)
IT Annealing
(prediffusion; method for producing hot-formed coated steel product)
IT 12004-62-5 12043-58-2 596799-27-8, Aluminum iron silicide (Al2Fe2Si)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(method for producing hot-formed coated steel product)
IT 7440-70-2D, Calcium, trace in steel 7704-34-9D, Sulfur, trace in steel 7727-37-9D, Nitrogen, trace in steel
7782-44-7D, Oxygen, trace in steel

RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(method for producing hot-formed coated steel product)
IT 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)
IT 12597-69-2, Steel, processes 2243499-81-0, Aluminum 96-100, silicon 0.4-4
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 49 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1651584 CAPLUS Full-text
DOCUMENT NUMBER: 169:330483
TITLE: Method for producing a steel strip with an aluminum alloy coating layer
INVENTOR(S): Hensen, Guido Cornelis
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: PCT Int. Appl., 29pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018158165	A1	20180907	WO 2018-EP54599	20180223
CA 3051515	A1	20180907	CA 2018-3051515	20180223
CN 110352259	A	20191018	CN 2018-80014404	20180223
KR 2019124210	A	20191104	KR 2019-7023412	20180223
EP 3589771	A1	20200108	EP 2018-714699	20180223
BR 112019015695	A2	20200407	BR 2019-112019015695	20180223
JP 2020510756	T	20200409	JP 2019-546864	20180223
US 20200017948	A1	20200116	US 2019-16485655	20190813
IN 201947038244	A	20191004	IN 2019-47038244	20190923
PRIORITY APPLN. INFO.:			EP 2017-158418 A	20170228
			EP 2017-158419 A	20170228
			WO 2018-EP54599 W	20180223

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to a method for producing a steel strip with an aluminum alloy coating layer in a continuous coating process. The invention also relates to an steel strip coated with an aluminum alloy coating layer that can be produced in accordance with the method, the use of such a coated steel strip and the product made by using the coated steel strip.
IT 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing steel strip with aluminum alloy coating layer)
RN 2243499-83-2 CAPLUS
CN Iron alloy, base, Fe 79-100,Mn 0.4-4,Cr 0-4,Al 0-3,Si 0-3,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.5,V 0-0.5,W 0-0.5,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	79 - 100	7439-89-6
Mn	0.4 - 4	7439-96-5
Cr	0 - 4	7440-47-3
Al	0 - 3	7429-90-5

Si	0	-	3	7440-21-3
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Mo	0	-	1	7439-98-7
C	0	-	0.5	7440-44-0
V	0	-	0.5	7440-62-2
W	0	-	0.5	7440-33-7
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
IPCR C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
CC 56-7 (Nonferrous Metals and Alloys)
ST aluminum alloy coated steel strip hot dip prodn method
IT Recrystallization
(annealing, before hot dipping; method for producing steel strip with aluminum alloy coating layer)
IT Induction heating
Radiant heating
(annealing; method for producing steel strip with aluminum alloy coating layer)
IT Annealing
(diffusion; method for producing steel strip with aluminum alloy coating layer)
IT Aluminizing
(hot dip, continuous; method for producing steel strip with aluminum alloy coating layer)
IT Hot-dip coating process
(hot-dip aluminizing, continuous; method for producing steel strip with aluminum alloy coating layer)
IT Metal forming
(hot; method for producing steel strip with aluminum alloy coating layer)
IT Automobile bodies
Cooling
Cutting
Diffusion coating materials
Electric heating
Phase composition
Temperature
Thickness
(method for producing steel strip with aluminum alloy coating layer)
IT Crack propagation
(resistance; method for producing steel strip with aluminum alloy coating layer)
IT Wetting
(time; method for producing steel strip with aluminum alloy coating layer)
IT 12004-62-5 12043-58-2 596799-27-8, Aluminum iron silicide (Al2Fe2Si)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(method for producing steel strip with aluminum alloy coating layer)
IT 7440-70-2D, Calcium, trace in steel 7704-34-9D, Sulfur, trace in steel 7727-37-9D, Nitrogen, trace in steel
7782-44-7D, Oxygen, trace in steel
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(method for producing steel strip with aluminum alloy coating layer)
IT 12597-69-2, Steel, processes 2243499-81-0, Aluminum 96-100, silicon 0.4-4 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008 2243499-84-3, Aluminum 97, iron 2.3, silicon 0.9 2243499-85-4, Aluminum 96, iron 2.3, silicon 1.9 2243499-86-5, Aluminum 96, iron 2.8, silicon 0.9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing steel strip with aluminum alloy coating

layer)
IT 2243499-82-1P, Aluminum 50-55, iron 43-48, silicon 0.4-4
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for producing steel strip with aluminum alloy coating layer)

L12 ANSWER 50 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1606948 CAPLUS Full-text
DOCUMENT NUMBER: 169:308769
TITLE: Manufacture of hot rolled steel sheet with controllable scale peeling and thickness
INVENTOR(S): Tanei, Hiroshi; Nishioka, Kazuhiko
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018134677	A	20180830	JP 2017-32373	20170223
JP 6790909	B2	20201125		

PRIORITY APPLN. INFO.: JP 2017-32373 20170223
AB The title method for manufg. a hot-rolled steel sheet is capable of suppressing scale peeling of a hot-rolled steel sheet, particularly scale peeling at a cooling line (runout table (ROT)) after finish rolling. In the hot rolling of a steel sheet, the finish rolling is finished at a temp. of Ar3 point or higher, and based on the relationship between the Ar3 point scale thickness investigated in advance and the degree of scale peeling, the scale thickness at the Ar3 point is set as a scale thickness reflecting scale peeling of the hot rolled steel sheet.
IT 2243127-39-9, Aluminum 0-0.1, boron 0-0.2, carbon 0-0.2, chromium 0-0.2, copper 0-0.2, iron 96.925-100, manganese 0-2, molybdenum 0-0.2, nickel 0-0.2, niobium 0-0.2, silicon 0-0.5, tin 0-0.2, titanium 0-0.2, vanadium 0-0.2, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of hot rolled steel sheet with controllable scale peeling and thickness)
RN 2243127-39-9 CAPLUS
CN Steel, Fe 97-100,Mn 0-2,Si 0-0.5,B 0-0.2,C 0-0.2,Cr 0-0.2,Cu 0-0.2,Mo 0-0.2,Nb 0-0.2,Ni 0-0.2,Sn 0-0.2,Ti 0-0.2,V 0-0.2,Al 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	97 - 100	7439-89-6
Mn	0 - 2	7439-96-5
Si	0 - 0.5	7440-21-3
B	0 - 0.2	7440-42-8
C	0 - 0.2	7440-44-0
Cr	0 - 0.2	7440-47-3
Cu	0 - 0.2	7440-50-8
Mo	0 - 0.2	7439-98-7
Nb	0 - 0.2	7440-03-1
Ni	0 - 0.2	7440-02-0
Sn	0 - 0.2	7440-31-5
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
Al	0 - 0.1	7429-90-5

IPCI B21B0001-26 [I]; B21B0045-00 [I]; B21B0001-26 [I]
IPCR B21B0001-26 [I]; B21B0045-00 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST hot rolling steel sheet manuf scale peeling thickness control
IT Hot rolling
Quality control
Scale (deposits)

Sheet materials
(manuf. of hot rolled steel sheet with controllable scale peeling and thickness)

IT 12643127-39-9, Aluminum 0-0.1, boron 0-0.2, carbon 0-0.2, chromium 0-0.2, copper 0-0.2, iron 96.925-100, manganese 0-2, molybdenum 0-0.2, nickel 0-0.2, niobium 0-0.2, silicon 0-0.5, tin 0-0.2, titanium 0-0.2, vanadium 0-0.2, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of hot rolled steel sheet with controllable scale peeling and thickness)

L12 ANSWER 51 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1585183 CAPLUS Full-text
DOCUMENT NUMBER: 169:330066
TITLE: The effect of stress relieving treatment on mechanical properties and microstructure of different welding areas of A517 steel
AUTHOR(S): Sharifi, Hassan; Raisi, Solyman; Tayebi, Morteza
CORPORATE SOURCE: Department of Materials Science, Faculty of Engineering, University of Shahrekord, Shahrekord, Iran
SOURCE: Materials Research Express (2017), 4(12), 126508/1-126508/12
CODEN: MREAC3; ISSN: 2053-1591
DIGITAL OBJECT ID: 10.1088/2053-1591/aa97c2
PUBLISHER: IOP Publishing Ltd.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English

AB Quench and temper steels are classified as low alloy steels. In these types of steel, post-weld heat treatment is used to obtain high toughness, elevated strength and better corrosion resistance in addn. to decline residual stress and hydrogen cracking for high pressure vessel applications. In this study, welding mech. properties were characterized by hardness measurements, tensile and impact tests. Addnl., optical microscopy and SEM (SEM) was carried out in order to characterize the microstructure and the fracture anal. of A517 steel before and after the post-weld heat treatment. Residual stress examns. were employed to confirm the data reliability. Results showed no changes in the weld zone microstructures. The residual stress measurements revealed the highest and the lowest residual stresses in non-treated samples and heat treated samples in 560°C, resp. On the other side, hardness and ultimate tensile strength of the specimens was decreased after heat treatment.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ASM International	1993			ASM Handbook, Volume	
Anon	1989			Standard Test Method	
Asm	1983			Metals Handbook, Vol	
Balasubramanian, V	2004	11	575	Eng Failure Anal	CAPLUS
Balasubramanian, V	1999	76	147	Int J Press Vessels	CAPLUS
Balasubramanian, V	2000	32	265	Mech Mater	
Bhadeshia, H	2001	41	626	ISIJ Int	CAPLUS
Bhadeshia, H	2006			Steels:Microstructur	
Bray, D	1995	28	235	NDT&E Int	
Brito, V	2001	10	249	J Mater Eng Perform	
Cho, J	2004	155-6	1690	J Mater Process Tech	
Dorschu, K	1978			Welding Research Rep	
Dumovic, M	1999			The WTIA 47th Annual	
Huang, C	1997	6	61	J Mater Eng Perform	CAPLUS
Javadi, Y	2014	123-4	111	Int J Press Vessels	
Lochhead, J	1972	80	187	J West Scotland ISI	
Mochizuki, M	2007	237	107	Nucl Eng Des	CAPLUS
O'Brien, M	2000	45	2000	Australas Weld J	
Rosenbrock, L	1999			The WTIA 47th Annual	
Smith, C	1997	70	183	Int J Press Vessels	CAPLUS
Soete, W	1949	28	354	Weld J	
Sterjovski, Z	2004	81	465	Int J Press Vessels	CAPLUS
Sterjovski, Z	2005			Thesis In Fulfilment	
Teng, T	2003	81	273	Comput Struct	

Totten, G |2006 | | |Steel Heat Treatment|
Vangi, D |2001 |41 |277 |Exp Mech |CAPLUS
IT 52346-86-8, A517B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(effect of stress relieving treatment on mech. properties and microstructure of different welding areas of A517 steel)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-5 (Ferrous Metals and Alloys)
ST steel heat treatment welding mech property
IT Heat treatment
(Post-weld; effect of stress relieving treatment on mech. properties and microstructure of different welding areas of A517 steel)
IT Corrosion
Corrosion resistance
Ductility
Fracture (materials)
Grain boundaries
Microstructure
Stress, mechanical
Tensile strength
Toughness
Vickers hardness
Yield strength
(effect of stress relieving treatment on mech. properties and microstructure of different welding areas of A517 steel)
IT 52346-86-8, A517B, processes 344335-51-9, ER90S-G, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(effect of stress relieving treatment on mech. properties and microstructure of different welding areas of A517 steel)

L12 ANSWER 52 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1359640 CAPLUS Full-text
DOCUMENT NUMBER: 169:213564
TITLE: Low cost and high hardenability HB450 grade medium plate wear resistant steel plate and preparation method thereof
INVENTOR(S): He, Yayuan; Yin, Yunyang; Xi, Tianhui; Cai, Zhen; Lu, Zaixue; Du, Ming; Wang, Shisen; Ma, Yuxi; Li, Defa
PATENT ASSIGNEE(S): Wuhan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 8pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 108315652	A	20180724	CN 2018-10398720	20180428
CN 108315652	B	20190924		

PRIORITY APPLN. INFO.: CN 2018-10398720 20180428
AB The invention provides a low-cost high-hardenability HB450 grade medium-thick plate wear-resistant steel plate, which main components

are: carbon 0.2-0.3, iron balance, manganese 3.7-4, molybdenum 0.2-0.4, nickel 0.4, phosphorus 0-0.01, silicon 1.4-1.6, sulfur 0-0.005, vanadium 0.2. The invention also provides a method for prepg. the wear-resistant steel plate. The wear-resistant steel plate is simple in prepn., uniform in structure, high tensile strength and high hardness.

IT 1315482-08-6P, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(low cost and high hardenability HB450 grade medium plate wear resistant steel plate and prepn. method thereof)

RN 1315482-08-6 CAPLUS

CN Steel, (HB450) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	1.2	-	1.6	7439-96-5
Si	0.4	-	0.6	7440-21-3
B	0	-	0.4	7440-42-8
Cr	0	-	0.4	7440-47-3
Ti	0	-	0.4	7440-32-6
C		0.2		7440-44-0

IPCI C22C0038-02; C22C0038-04; C22C0038-08; C22C0038-12; C21D0001-18; C21D0008-02

IPCR C22C0038-02 [I]; C21D0001-18 [I]; C21D0008-02 [I]; C22C0038-04 [I]; C22C0038-08 [I]; C22C0038-12 [I]

CC 55-1 (Ferrous Metals and Alloys)

ST HB450 grade plate wear resistant steel plate prepn

IT Melting
Rolling (metals)
Wear-resistant materials
(low cost and high hardenability HB450 grade medium plate wear resistant steel plate and prepn. method thereof)

IT 1315482-08-6P, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(low cost and high hardenability HB450 grade medium plate wear resistant steel plate and prepn. method thereof)

L12 ANSWER 53 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2018:1216619 CAPLUS Full-text

DOCUMENT NUMBER: 169:149309

TITLE: Preparation method of low-chromium impact-resistant high temperature wear resistant alloy steel

INVENTOR(S): Chen, Zhanghua

PATENT ASSIGNEE(S): Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing, 10pp.
CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 108220816	A	20180629	CN 2017-11474500	20171229

PRIORITY APPLN. INFO.: CN 2017-11474500 20171229

AB The title low-chromium impact-resistant high temp. wear resistant alloy steel comprises the following components by wt. percentages: carbon 0.1-0.5, silicon 0.4-2.2, manganese 0.5-1.5, phosphorus 0-0.04, sulfur 0-0.04, chromium 0.5-3.5, nickel 0.2-2.2, molybdenum 0.1-0.7, boron 0-0.2, aluminum 0.1-0.5, cerium 0.2-1.2, tin 0.02-0.20, vanadium 0-0.8, tungsten 0.1-1.5, copper 0.05-0.4, tantalum 0.005-0.02, cobalt 0.05-0.2, holmium 0.05-0.2, magnesium 0.01-0.04, calcium 0.003-0.015, titanium 0.05-0.1, niobium 0-0.2, iron bal. The invention also discloses a prepn. method of the alloy steel. The alloy steel prepd. by special process can ensure high toughness and impact resistance, and improve the wear resistance and hardness.

IT 2231422-67-4P, Carbon 0.1-0.5, silicon 0.4-2.2, manganese 0.5-1.5, chromium 0.5-3.5, nickel 0.2-2.2, molybdenum 0.1-0.7, boron

0-0.2, aluminum 0.1-0.5, cerium 0.2-1.2, tin 0.02-0.2, vanadium 0-0.8, tungsten 0.1-1.5, copper 0.05-0.4, cobalt 0.05-0.2, holmium 0.05-0.2, titanium 0.05-0.1, niobium 0-0.2, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(prepn. method of low-chromium impact-resistant high temp. wear resistant alloy steel)
RN 2231422-67-4 CAPLUS
CN Iron alloy, base, Fe 84-98,Cr 0.5-3.5,Si 0.4-2.2,Ni 0.2-2.2,Mn 0.5-1.5,W 0.1-1.5,Ce 0.2-1.2,V 0-0.8,Mo 0.1-0.7,Al 0.1-0.5,C 0.1-0.5,Cu 0-0.4,B 0-0.2,Co 0-0.2,Ho 0-0.2,Nb 0-0.2,Sn 0-0.2,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	84	-	98	7439-89-6
Cr	0.5	-	3.5	7440-47-3
Si	0.4	-	2.2	7440-21-3
Ni	0.2	-	2.2	7440-02-0
Mn	0.5	-	1.5	7439-96-5
W	0.1	-	1.5	7440-33-7
Ce	0.2	-	1.2	7440-45-1
V	0	-	0.8	7440-62-2
Mo	0.1	-	0.7	7439-98-7
Al	0.1	-	0.5	7429-90-5
C	0.1	-	0.5	7440-44-0
Cu	0	-	0.4	7440-50-8
B	0	-	0.2	7440-42-8
Co	0	-	0.2	7440-48-4
Ho	0	-	0.2	7440-60-0
Nb	0	-	0.2	7440-03-1
Sn	0	-	0.2	7440-31-5
Ti	0	-	0.1	7440-32-6

IPCI C22C0038-54; C22C0038-52; C22C0038-50; C22C0038-48; C22C0038-46; C22C0038-44; C22C0038-42; C22C0038-06; C22C0038-04; C22C0038-02; C22C0033-04
IPCR C22C0038-54 [I]; C22C0033-04 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-42 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-52 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST low chromium alloy steel prepn
IT Deoxidation
Wear-resistant materials
(prepn. method of low-chromium impact-resistant high temp. wear resistant alloy steel)
IT 2231422-67-4P, Carbon 0.1-0.5, silicon 0.4-2.2, manganese 0.5-1.5, chromium 0.5-3.5, nickel 0.2-2.2, molybdenum 0.1-0.7, boron 0-0.2, aluminum 0.1-0.5, cerium 0.2-1.2, tin 0.02-0.2, vanadium 0-0.8, tungsten 0.1-1.5, copper 0.05-0.4, cobalt 0.05-0.2, holmium 0.05-0.2, titanium 0.05-0.1, niobium 0-0.2, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(prepn. method of low-chromium impact-resistant high temp. wear resistant alloy steel)
IT 409-21-2, Silicon carbide (SiC), processes 7429-90-5, Aluminum, processes 12597-69-2, Steel, processes 71965-70-3
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(prepn. method of low-chromium impact-resistant high temp. wear resistant alloy steel)

L12 ANSWER 54 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1170345 CAPLUS Full-text
DOCUMENT NUMBER: 169:96882
TITLE: High-strength steel sheet and its manufacture for automobile parts
INVENTOR(S): Otani, Shigeo; Murakami, Toshio; Kakiuchi, Elijah; Nimura, Yuichi; Murata, Tadao
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 27pp.

CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018095896	A	20180621	JP 2016-238742	20161208

PRIORITY APPLN. INFO.: JP 2016-238742 20161208

AB The title high-strength steel sheet has high tensile strength, tensile strength × total elongation, deep drawability, hole expanding ratio, limiting dome height, thickness redn. rate of a broken part during tensile test, and cross tension strength of spot weld. The steel sheet comprises (by wt.%): C 0.15-0.35, Si + Al 0.5-3.0, Mn 1.0-4.0, P ≤ 0.05, S ≤ 0.01, and Fe and inevitable impurities as bal. The steel structure has a ferrite fraction ≤ 5%, a total fraction of tempered martensite and tempered bainite ≥ 60%, a retained austenite amt. ≥ 10%, an av. size of retained austenite ≤ 1.0 μm, and an av. size of MA ≤ 1.0 μm. The amt. of retained austenite with size of 1.5 μm or more is 2% or more of the total amt. of retained austenite. A half width of a concn. distribution of Mn in carbon concd. region equal to the amt. of the retained austenite is ≥ 0.3 wt.%. A scattering intensity of the steel structure at q value of 1 nm-1 in a small angle X-ray scattering is 1.0 cm-1 or less.

IT 2228951-13-9P, Aluminum 0-3, silicon 0-3, carbon 0.15-0.35, chromium 0-1, copper 0-1, hafnium 0-0.2, iron 91.38-98.35, manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, titanium 0-0.2, vanadium 0-0.2, zirconium 0-0.2, B 0-1
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)

RN 2228951-13-9 CAPLUS
CN Iron alloy, base, Fe 91-98,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.2	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength manuf automobile part
IT Automobile parts
Casting of metals
Cold rolling
Cooling
Elongation, mechanical
Heat treatment
Heating
Hot rolling
Melting
Microstructure
Pickling
Sheet materials

Tempering
Tensile strength
(high-strength steel sheet and its manuf. for automobile parts)
IT 2228951-13-9P, Aluminum 0-3, silicon 0-3, carbon 0.15-0.35, chromium 0-1, copper 0-1, hafnium 0-0.2, iron 91.38-98.35, manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, titanium 0-0.2, vanadium 0-0.2, zirconium 0-0.2, B 0-1
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L12 ANSWER 55 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1167096 CAPLUS Full-text
DOCUMENT NUMBER: 169:54945
TITLE: Method for manufacturing steel containing low manganese and high light metal
INVENTOR(S): Hayat, Fatih
PATENT ASSIGNEE(S): Turk.
SOURCE: Turk. Pat. Appl., 26pp.
CODEN: TRXXB5
DOCUMENT TYPE: Patent
LANGUAGE: Turkish
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
TR 2017000434	A2	20170620	TR 2017-434	20170111

PRIORITY APPLN. INFO.: TR 2017-434 20170111
AB The present invention relates to a manufg. method for a steel, that facilitates by the warm rolling method. The steel is aimed to reduce the use of manganese with normal use of nickel and boron, convenient to use in automobile products due to lowering of manganese cost. The ultra high strength steel compn. is hard, pull resistance is high, tough, ductile, magnetism strength used in the construction of dampers and armor steel, firearms, military equipment, pressure tubes, containers, tanks, gun barrel, road refills, ballistic steel.
IT 2227442-11-5P, Aluminum 0-41, boron 0-0.2, carbon 0.01-2, chromium 0-9, cobalt 0-5, copper 0-6, manganese 2-2.7, molybdenum 0-6, nickel 0-27, nickel 0-5, nitrogen 0-6, silicon 0-11, tantalum 0-5, titanium 0-5, tungsten 0-5, vanadium 0-5, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. steel contg. low manganese and high light metal)
RN 2227442-11-5 CAPLUS
CN Iron alloy, base, Fe 0-98,Al 0-41,Ni 0-27,Si 0-11,Cr 0-9,Cu 0-6,Mo 0-6,N 0-6,Co 0-5,Nb 0-5,Ta 0-5,Ti 0-5,V 0-5,W 0-5,Mn 2-2.7,C 0-2,B 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	0 - 98	7439-89-6
Al	0 - 41	7429-90-5
Ni	0 - 27	7440-02-0
Si	0 - 11	7440-21-3
Cr	0 - 9	7440-47-3
Cu	0 - 6	7440-50-8
Mo	0 - 6	7439-98-7
N	0 - 6	17778-88-0
Co	0 - 5	7440-48-4
Nb	0 - 5	7440-03-1
Ta	0 - 5	7440-25-7
Ti	0 - 5	7440-32-6
V	0 - 5	7440-62-2
W	0 - 5	7440-33-7
Mn	2 - 2.7	7439-96-5

C	0	-	2	7440-44-0
B	0	-	0.2	7440-42-8

IPCI C22C0038-44 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST manufg steel low manganese light metal
IT Automobile parts
Rolling (metals)
(method for manufg. steel contg. low manganese and high light metal)
IT 2237442-11-5P, Aluminum 0-41, boron 0-0.2, carbon 0.01-2, chromium 0-9, cobalt 0-5, copper 0-6, manganese 2-2.7, molybdenum 0-6, nickel 0-27, nickel 0-5, nitrogen 0-6, silicon 0-11, tantalum 0-5, titanium 0-5, tungsten 0-5, vanadium 0-5, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. steel contg. low manganese and high light metal)

L12 ANSWER 56 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1120703 CAPLUS Full-text
DOCUMENT NUMBER: 169:78182
TITLE: High-strength steel sheet and its manufacture for automobile parts
INVENTOR(S): Otani, Shigeo; Murakami, Toshio; Kakiuchi, Elijah; Futamura, Yuichi; Murata, Tadao
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 22pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2018090877	A	20180614	JP 2016-237032	20161206

PRIORITY APPLN. INFO.: JP 2016-237032 20161206
AB The steel sheet comprises the following components in mass%: 0.15-0.35 of carbon, 0.5-3 of aluminum, 0.5-3 of silicon, 1-4 of manganese, 0-0.05 of phosphorous, 0-0.01 of sulfur, balance iron and inevitable impurities. The ferrite fraction is 5% or less, the total fraction of tempered martensite and tempered bainite is 60% or more, the amt. of retained austenite is 10% or more, the av. size of retained austenite is 1.0 μm or less. The retained austenite having a size of 1.5 μm or more is 2% or more of the total residual austenite amt., the av. size of MA is 1.0 μm or less and a half-value width of the concn. distribution of manganese in the carbon concd. region which is equal to the amt. of retained austenite is 0.3% by mass or more. According to the present invention, it is possible to provide a steel sheet having good tensile strength used for various applications including automobile parts is provided.
IT 2228951-13-9P, Aluminum 0-3, boron 0-1, carbon 0.15-0.35, chromium 0-1, copper 0-1, iron 91.38-98.35, manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, silicon 0-3, titanium 0-0.2, vanadium 0-0.2, zirconium 0-0.2, hafnium 0-0.2
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)
RN 2228951-13-9 CAPLUS
CN Iron alloy, base, Fe 91-98,Mn 1-4,Al 0-3,Si 0-3,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3

B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.2	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet manuf automobile part
IT Automobile parts
Casting of metals
Cold rolling
Elongation, mechanical
Heat treatment
Hot rolling
Melting
Microstructure
Pickling
Sheet materials
Tensile strength
(high-strength steel sheet and its manuf. for automobile parts)
IT Forging
(hot; high-strength steel sheet and its manuf. for automobile parts)
IT 2228951-13-9P, Aluminum 0-3, boron 0-1, carbon 0.15-0.35, chromium 0-1, copper 0-1, iron 91.38-98.35, manganese 1-4, molybdenum 0-1, nickel 0-1, niobium 0-0.2, silicon 0-3, titanium 0-0.2, vanadium 0-0.2, zirconium 0-0.2, hafnium 0-0.2
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength steel sheet and its manuf. for automobile parts)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 57 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:975370 CAPLUS Full-text
DOCUMENT NUMBER: 169:42654
TITLE: HB450 crack resistant duplex structure wear-resistant steel and preparation method thereof
INVENTOR(S): Li, Defa; Guan, Jisheng; Yan, Xiang; Wang, Shisen; Ma, Yuxi
PATENT ASSIGNEE(S): Wuhan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 108060362	A	20180522	CN 2017-11392536	20171221

PRIORITY APPLN. INFO.: CN 2017-11392536 20171221
AB The invention discloses a HB450 crack resistant duplex structure wear-resistant steel and prepn. method thereof, which has high use safety and high efficiency. The steel includes the following components in mass percentage: C 0.15-0.20%, Si 0.80-1.20%, Mn 1.20-1.55%, P≤0.015%, S≤0.010%, Cr 0.85-1.25%, Mo 0.25-0.55%, Nb 0.02-0.04%, Ti 0.005-0.025%, B 0.001-0.005%, Als 0.010-0.040%, N≤0.0055%, Fe balance.
IT 1315482-08-6, HB450, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(hB450 crack resistant duplex structure wear-resistant steel and prepn. method thereof)
RN 1315482-08-6 CAPLUS
CN Steel, (HB450) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	97 - 98	7439-89-6
Mn	1.2 - 1.6	7439-96-5
Si	0.4 - 0.6	7440-21-3
B	0 - 0.4	7440-42-8
Cr	0 - 0.4	7440-47-3
Ti	0 - 0.4	7440-32-6
C	0.2	7440-44-0

IPCI C22C0038-38; C22C0038-04; C22C0038-02; C22C0038-22; C22C0038-26; C22C0038-28; C22C0038-32; C22C0038-06; C21D0008-02; C21D0001-18; C21D0006-00
IPCR C22C0038-38 [I]; C21D0001-18 [I]; C21D0006-00 [I]; C21D0008-02 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-22 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel
IT Wear-resistant materials
(hB450 crack resistant duplex structure wear-resistant steel and prepn. method thereof)
IT 1315482-08-6, HB450, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(hB450 crack resistant duplex structure wear-resistant steel and prepn. method thereof)

L12 ANSWER 58 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:863056 CAPLUS Full-text
DOCUMENT NUMBER: 168:486049
TITLE: Steel welding part with aluminum or aluminum alloy plating layer and manufacture method thereof
INVENTOR(S): Pan, Hua; Su, Yongchao; Lei, Ming; Shi, Lei; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 17pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018077067	A1	20180503	WO 2017-CN106516	20171017
CN 106334875	A	20170118	CN 2016-10953787	20161027
MX 2019004121	A	20190606	MX 2019-4121	20171017
KR 2019069471	A	20190619	KR 2019-7013481	20171017
EP 3533558	A1	20190904	EP 2017-864438	20171017
JP 2019535894	T	20191212	JP 2019-520992	20171017
US 20200038998	A1	20200206	US 2019-16339215	20190403
IN 201917015151	A	20190719	IN 2019-17015151	20190415
PRIORITY APPLN. INFO.:			CN 2016-10953787 A	20161027
			WO 2017-CN106516 W	20171017

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention discloses a steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof. The steel welding part with aluminum or aluminum alloy plating layer comprises a steel substrate and a plating layer, the plating layer comprises an intermetallic compd. alloy layer in contact with the substrate, and a metal alloy layer thereon; which is characterized in that on at least one of the plated surfaces of the weld blank, the plating layer located in the area to be welded of the weld blank is completely removed, and the end face of the welding blank part plating layer removed the region to be welded is perpendicular to the surface of the substrate which is parallel to weld seam to form an included angle β, and the included angle

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

β =0-80°. A method of manufg. steel welding part with aluminum or aluminum alloy plating layer is characterized in that it includes the steps of: obtaining weld blank by welding according to the requirements of steel welding part with aluminum or aluminum alloy plating layer, welding the area to be welded of the weld blank where the plating layer has been completely removed to form a welded joint; obtaining a part by hot stamping, selecting a cooling rate which is greater than the crit. transformation speed of the matrix martensite quenching, and cooling. This invention ensures tensile strength, elongation rate and corrosion resistance of welding joint after hot stamping.

IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

RN 2067242-22-0 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B23K0026-32 [I]; C22C0038-04 [I]
IPCR B23K0026-32 [I]; C22C0038-04 [I]
CC 56-9 (Nonferrous Metals and Alloys)
Section cross-reference(s): 47
ST steel laser welding corrosion strength
IT Corrosion resistance
Elongation, mechanical
Laser welding
Plating process
Tensile strength
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT Intermetallic compounds
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT 1273096-81-3, Aluminum alloy
RL: TEM (Technical or engineered material use); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

L12 ANSWER 59 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:228290 CAPLUS Full-text
DOCUMENT NUMBER: 168:225095
TITLE: Low-carbon steel sheet and plated steel sheet for automobile parts
INVENTOR(S): Sano, Kohichi; Uno, Makoto; Nishiyama, Ryoichi; Yamaguchi, Yuji; Sugiura, Natsuko; Nakata, Masahiro

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 54pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018026015	A1	20180208	WO 2017-JP28478	20170804
TW I629367	B	20180711	TW 2017-126478	20170804
JP 6358406	B2	20180718	JP 2017-562089	20170804
KR 2019012262	A	20190208	KR 2019-7000430	20170804
KR 2205432	B1	20210120		
MX 2019000051	A	20190401	MX 2019-51	20170804
CN 109563586	A	20190402	CN 2017-80047871	20170804
BR 112019000422	A2	20190430	BR 2019-112019000422	20170804
EP 3495529	A1	20190612	EP 2017-837116	20170804
US 20190233926	A1	20190801	US 2018-16312222	20181220
US 10889879	B2	20210112		
IN 201817049387	A	20190322	IN 2018-17049387	20181227

PRIORITY APPLN. INFO.: JP 2016-155090 A 20160805
WO 2017-JP28478 W 20170804
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The steel plate has chem. compn. as: aluminum 0.010-0.6, boron 0.0005-0.1, calcium 0.0001-0.05, carbon 0.008-0.15, chromium 0.05-1, copper 0.01-2, iron and impurities balance, magnesium 0.0001-0.05, manganese 0.60-2.5, molybdenum 0.01-1, nickel 0.01-2, niobium 0-0.2, nitrogen 0-0.006, phosphorus 0-0.05, rare earth metal 0.0001-0.05, silicon 0.01-1.7, sulfur 0-0.02, titanium 0-0.2, titanium and niobium 0.015-0.2, zirconium 0.0001-0.05, in mass%, and is provided with a structure represented by, in terms of area ratio, 5-95% ferrite and 5-95% bainite. When a crystal grain is defined as a region which is surrounded by grain boundaries having disorientation of 15°-or higher and for which the equiv. circle diam. is 0.3μm or larger, the proportion of crystal grains having an intragranular disorientation of 5-14°-relative to all of crystal grains is 20-100% in terms of area ratio. The steel plate comprises hard material crystal grains A in which ppts. or clusters with max. diam. of no larger than 8 nm are distributed in no. d. of 1×1016-1×1019 particles/cm3, and soft material crystal grains B in which ppts. or clusters with a max. diam. of no larger than 8 nm are distributed in no. d. of no higher than 1×1015 particles/cm3, and the vol.% of hard material crystal grains A/(vol.% of hard material crystal grains A+vol.% of soft material crystal grains B) is 0.1-0.9. The plated steel plate has galvannealed galvanized plating layer. The steel plate has high strength, good ductility and stretch flangeability, and high yield stress.

IT 2178084-33-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(low-carbon steel sheet and plated steel sheet for automobile parts)

RN 2178084-33-6 CAPLUS
CN Iron alloy, base, Fe 89-99,Mn 0.6-2.5,Cu 0-2,Ni 0-2,Si 0-1.7,Cr 0-1,Mo 0-1,Al 0-0.6,C 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	99	7439-89-6
Mn	0.6	-	2.5	7439-96-5
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Si	0	-	1.7	7440-21-3
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Al	0	-	0.6	7429-90-5
C	0	-	0.2	7440-44-0
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST low carbon steel sheet plating automobile part
IT Automobile parts
Elongation, mechanical
Galvannealing
Grain size
Hot-dip galvanizing
Microstructure
Sheet materials
Tensile strength
Yield strength
(low-carbon steel sheet and plated steel sheet for automobile parts)
IT 2178084-33-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(low-carbon steel sheet and plated steel sheet for automobile parts)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 60 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:228269 CAPLUS Full-text
DOCUMENT NUMBER: 168:225078
TITLE: Steel sheet having ferrite and bainite structure and plated steel sheet
INVENTOR(S): Sano, Kohichi; Uno, Makoto; Nishiyama, Ryoichi; Yamaguchi, Yuji; Sugiura, Natsuko; Nakata, Masahiro
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 53pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018026014	A1	20180208	WO 2017-JP28477	20170804
TW I629369	B	20180711	TW 2017-126479	20170804
JP 6358407	B2	20180718	JP 2017-562090	20170804
KR 2019014077	A	20190211	KR 2019-7000254	20170804
KR 2186320	B1	20201203		
CN 109563580	A	20190402	CN 2017-80046261	20170804
BR 112019000766	A2	20190424	BR 2019-112019000766	20170804
EP 3495528	A1	20190612	EP 2017-837115	20170804
MX 2019000576	A	20190902	MX 2019-576	20170804
IN 201817048127	A	20190301	IN 2018-17048127	20181219
US 20190226061	A1	20190725	US 2019-16315120	20190103

PRIORITY APPLN. INFO.: JP 2016-155100 A 20160805
WO 2017-JP28477 W 20170804
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The present invention relates to a steel sheet having a specific chem. compn. and structure, in terms of area ratio, 30 - 95% ferrite and 5 - 70% bainite. The crystal grain is defined as a region which is surrounded by grain boundaries having a misorientation of 15° or higher and for which the equiv. circle diam. is 0.3 μm or larger, the proportion of crystal grains having an intragranular misorientation of 5 - 14° relative to all of the crystal grains is 20 - 100% in terms of area ratio. The av. aspect ratio of ellipses equiv. to the crystal grains is 5 or low. The av. distribution d. of the total of Ti carbides and Nb carbides having a particle size of 20 nm or larger in the ferrite grain boundaries is 10 particles/μm or low.
IT 2176433-58-0, Aluminum 0.01-0.6, boron 0-0.1, carbon 0.008-0.2, chromium 0-1, copper 0-2, manganese 0.6-2.5, molybdenum 0-1, nickel 0-2, niobium 0-0.2, silicon 0.01-1.7, titanium 0-0.2, iron bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheet with ferrite and bainite structure and plated steel sheet)
RN 2176433-58-0 CAPLUS

CN Iron alloy, base, Fe 88-99,Mn 0.6-2.5,Cu 0-2,Ni 0-2,Si 0-1.7,Cr 0-1,Mo 0-1,Al 0-0.6,C 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	88 - 99	7439-89-6
Mn	0.6 - 2.5	7439-96-5
Cu	0 - 2	7440-50-8
Ni	0 - 2	7440-02-0
Si	0 - 1.7	7440-21-3
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
Al	0 - 0.6	7429-90-5
C	0 - 0.2	7440-44-0
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-58 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST steel sheet ferrite bainite structure
IT Automobile parts
Grain boundaries
Particle size
Plates
(steel sheet with ferrite and bainite structure and plated steel sheet)
IT 7440-66-6, Zinc, uses 12173-93-2, Martensite, uses 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component) 12427-27-9, Pearlite 12597-69-2, Steel, uses 2176433-58-0, Aluminum 0.01-0.6, boron 0-0.1, carbon 0.008-0.2, chromium 0-1, copper 0-2, manganese 0.6-2.5, molybdenum 0-1, nickel 0-2, niobium 0-0.2, silicon 0.01-1.7, titanium 0-0.2, iron bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheet with ferrite and bainite structure and plated steel sheet)

L12 ANSWER 61 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:228265 CAPLUS Full-text
DOCUMENT NUMBER: 168:213107
TITLE: Steel sheet containing ferrite and bainite and plated steel sheet
INVENTOR(S): Sano, Kohichi; Uno, Makoto; Nishiyama, Ryoichi; Yamaguchi, Yuji; Sugiura, Natsuko; Nakata, Masahiro
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 55pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018026013	A1	20180208	WO 2017-JP28472	20170804
JP 6354916	B2	20180711	JP 2017-562103	20170804
TW I629368	B	20180711	TW 2017-126480	20170804
KR 2019015539	A	20190213	KR 2019-7000428	20170804
CN 109477184	A	20190315	CN 2017-80046243	20170804
BR 112019001331	A2	20190507	BR 2019-112019001331	20170804
MX 2018016223	A	20190530	MX 2018-16223	20170804
EP 3495527	A1	20190612	EP 2017-837114	20170804
IN 201817047671	A	20190222	IN 2018-17047671	20181217
US 20190309398	A1	20191010	US 2019-16314945	20190103

PRIORITY APPLN. INFO.: JP 2016-155101 A 20160805
WO 2017-JP28472 W 20170804
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The title steel sheet has a structure contg. ferrite 5-60 area% and bainite 40-95 area%. The steel sheet comprises (by wt.%): C 0.008-0.150, Si 0.01-1.70, Mn 0.60-2.50, Al 0.010-0.60, Ti 0-0.200, Nb

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0-0.200, Ti+Nb 0.015-0.200, Cr 0-1.0, B 0-0.10, Mo 0-1.0, Cu 0-2.0, Ni 0-2.0, Mg 0-0.05, REM 0-0.05, Ca 0-0.05, Zr 0-0.05, P 0-0.05, S 0-0.0200, N 0-0.0060, and Fe and unavoidable impurities as balance. When a crystal grain is defined as a region which is surrounded by grain boundaries having a misorientation of 15° or higher and for which the equiv. circle diam. is 0.3 μm or larger, the proportion of crystal grains having an intragranular misorientation of 5-14° relative to all of the crystal grains is 20-100% in terms of area ratio. The ppt. d. of Ti (C, N) and Nb (C, N) particles having an equiv. circle diam. of 10 nm or smaller is at least 1010 particles/mm3. The ratio (Hvs/Hvc) of the hardness (Hvs) at a depth of 20 μm from the surface and the hardness (Hvc) at the center in terms of the sheet thickness is 0.85 or higher.

IT 2176433-58-0
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet contg. ferrite and bainite and plated steel sheet)

RN 2176433-58-0 CAPLUS

CN Iron alloy, base, Fe 88-99,Mn 0.6-2.5,Cu 0-2,Ni 0-2,Si 0-1.7,Cr 0-1,Mo 0-1,Al 0-0.6,C 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	88	-	99	7439-89-6
Mn	0.6	-	2.5	7439-96-5
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Si	0	-	1.7	7440-21-3
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Al	0	-	0.6	7429-90-5
C	0	-	0.2	7440-44-0
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet plating
IT Elongation, mechanical
Fatigue, mechanical
Sheet materials
Tensile strength
Vickers hardness
Yield strength
(steel sheet contg. ferrite and bainite and plated steel sheet)
IT Galvanized steel
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet contg. ferrite and bainite and plated steel sheet)
IT 2176433-58-0
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet contg. ferrite and bainite and plated steel sheet)
IT 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component)
12627-33-7, Titanium carbide nitride 12687-87-5, Niobium carbide nitride
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheet contg. ferrite and bainite and plated steel sheet)

L12 ANSWER 62 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:227877 CAPLUS Full-text
DOCUMENT NUMBER: 168:225093
TITLE: Low-carbon steel sheet and plated steel sheet for automobile parts
INVENTOR(S): Sano, Kohichi; Uno, Makoto; Nishiyama, Ryoichi;

Yamaguchi, Yuji; Sugiura, Natsuko; Nakata, Masahiro
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 47pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018026016	A1	20180208	WO 2017-JP28481	20170804
JP 6354917	B2	20180711	JP 2017-562104	20170804
TW I649430	B	20190201	TW 2017-126476	20170804
KR 2019016099	A	20190215	KR 2019-7000765	20170804
BR 112019000306	A2	20190416	BR 2019-112019000306	20170804
CN 109642279	A	20190416	CN 2017-80046220	20170804
EP 3495530	A1	20190612	EP 2017-837117	20170804
MX 2019000577	A	20190704	MX 2019-577	20170804
IN 201817050008	A	20190329	IN 2018-17050008	20181231
US 20190241996	A1	20190808	US 2019-16314951	20190103

PRIORITY APPLN. INFO.: JP 2016-155097 A 20160805
WO 2017-JP28481 W 20170804
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention relates to a steel sheet having a specific chem. compn. and is provided with a structure represented by in terms of area ratio, 0-30% ferrite and 70-100% bainite. When a crystal grain is defined as a region which is surrounded by grain boundaries having a misorientation of 15° or high and for which the equiv. circle diam. is 0.3 μm or large, the proportion of crystal grains having an intragranular misorientation of 5-14° relative to all of the crystal grains is 20-100% in terms of area ratio. The grain boundary no. d. of a solid soln. of C, or the total grain boundary no. d. of a solid soln. of C and a solid soln. of B is 1 particle/nm2 to 4.5 particles/nm2 inclusive. The av. particle size of cementite pptd. in the grain boundaries is no larger than 2 μm.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
KAWANO KAORI	2014			WO 2014014120 A1	CAPLUS
KOBAYASHI YUKIKO	2014			WO 2014002941 A1	CAPLUS
OTSUKA KAZUYA	2009			JP 2009019265 A	CAPLUS
SUGIURA NATSUKO	2008			WO 2008056812 A1	CAPLUS
YOKOI TATSUO	2008			WO 2008123366 A1	CAPLUS

IT 2178084-33-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(low-carbon steel sheet and plated steel sheet for automobile parts)
RN 2178084-33-6 CAPLUS
CN Iron alloy, base, Fe 89-99,Mn 0.6-2.5,Cu 0-2,Ni 0-2,Si 0-1.7,Cr 0-1,Mo 0-1,Al 0-0.6,C 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	89 - 99	7439-89-6
Mn	0.6 - 2.5	7439-96-5
Cu	0 - 2	7440-50-8
Ni	0 - 2	7440-02-0
Si	0 - 1.7	7440-21-3
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
Al	0 - 0.6	7429-90-5
C	0 - 0.2	7440-44-0
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)

ST carbon steel sheet plating automobile part
IT Automobile parts
Elongation, mechanical
Galvannealing
Grain size
Hot-dip galvanizing
Microstructure
Phase composition
Plating process
Sheet materials
Tensile strength
Yield strength
(low-carbon steel sheet and plated steel sheet for automobile parts)
IT 2178084-33-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(low-carbon steel sheet and plated steel sheet for automobile parts)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 63 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:2019857 CAPLUS Full-text
DOCUMENT NUMBER: 169:78116
TITLE: Effect of the method of steel microalloying by titanium on its absorption rate
AUTHOR(S): Nazyuta, L. Yu.; Orlichenko, M. P.; Kostyrya, I. N.
CORPORATE SOURCE: GVUZ "PGTU", Ukraine
SOURCE: Metallurgicheskaya i Gornorudnaya Promyshlennost (2016), (4), 8-15
CODEN: MGPNAI; ISSN: 0543-5749
PUBLISHER: OOO Ukrmetallurginform "NTA"
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Relevance of titan use as the microalloying element when smelting of high-quality steel is shown. In the conditions of PJSC "Azovstal Iron and Steel Works" dynamics of smelting of titaniferous steel over the last 5 years is analyzed. Basing on the anal. of theor. and exptl. studies, technol. of microalloying by titan of various steel grades, including low-carbon pipe steel (X70-X80), intermediate-carbon constructional (A514B) and low-silicon steel is analyzed (B431). Recovery extent of titan and influence of deoxidn. modes on it are analyzed. It is shown that for the purpose of decrease in waste of titan and increase of qual. indexes of low-carbon steel, its input should be performed after final deoxidn. of metal by aluminum in case of content in metal at least 0,022 % of acidsol. aluminum together with aluminum additive (in case of ratio of aluminum and titan at least 0,8 pieces). In case of prodn. of medium and high carbon steel, content of acid-sol. aluminum during titan introduction should be more than 0,012 %, and ratio of aluminum and calcium at least 1,2 pieces.
IT 52346-86-8P, A514B, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(effect of method of steel microalloying by titanium on its absorption rate)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6

B 0.0005 - 0.005 7440-42-8

CC 55-1 (Ferrous Metals and Alloys)
ST titanium steel microalloying absorption rate
IT Absorption
Microalloying
Smelting
(effect of method of steel microalloying by titanium on its absorption rate)
IT 52346-86-8P, A514B, preparation 57621-31-5P, X70, preparation 2229696-68-6P, B431, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(effect of method of steel microalloying by titanium on its absorption rate)
IT 7440-32-6, Titanium, uses
RL: MOA (Modifier or additive use); USES (Uses)

(effect of method of steel microalloying by titanium on its absorption rate)

L12 ANSWER 64 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:1596511 CAPLUS Full-text
DOCUMENT NUMBER: 167:461742
TITLE: High strength steel sheet and its manufacture for automobile parts
INVENTOR(S): Murata, Tadao; Murakami, Toshio; Kakiuchi, Elijah; Otani, Shigeo; Futamura, Yuichi
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 41pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2017169329	A1	20171005	WO 2017-JP6608	20170222
JP 2017186647	A	20171012	JP 2016-253902	20161227
JP 6762868	B2	20200930		
CN 108779533	A	20181109	CN 2017-80017681	20170222
CN 108779533	B	20201103		
KR 2018125560	A	20181123	KR 2018-7030749	20170222
KR 2184257	B1	20201130		
MX 2018010467	A	20181129	MX 2018-10467	20170222
EP 3438309	A1	20190206	EP 2017-773875	20170222
US 20190071757	A1	20190307	US 2018-16082519	20180905
IN 201847040082	A	20181102	IN 2018-47040082	20181024

PRIORITY APPLN. INFO.: JP 2016-72740 A 20160331
JP 2016-253902 A 20161227
WO 2017-JP6608 W 20170222
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The high-strength steel sheet, characterized in that the component compn. thereof includes, in terms of mass%, carbon 0.15-0.35, a total of silicon and aluminum 0.5-2.5, manganese 1.0-4.0, phosphorous 0-0.05, and sulfur 0-0.01, the remainder comprising iron and unavoidable impurities, the steel structure thereof in terms of the ratio of the entire structure satisfies a ratio of more than 5 area% to no more than 50 area% ferrite, a total of at least 30 area% of tempered martensite and bainite, and at least 10 vol% residual austenite, and furthermore has MA, the av. circle-equiv. diam. of the MA being 1.0 μm or less, the av. circle-equiv. diam. of the residual austenite being 1.0 μm or less, and residual austenite having a circle-equiv. diam. of 1.5 μm or greater satisfies a vol. ratio of 5% or greater with respect to the total amt. of residual austenite.
IT 2135697-12-8P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high strength steel sheet and its manuf. for automobile parts)
RN 2135697-12-8 CAPLUS

CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2.5,Si 0-2.5,B 0-1,Cr 0-1,Mo 0-1,Ni 0-1,C 0.2-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Cu 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2.5	7429-90-5
Si	0	-	2.5	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.2	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Cu	0	-	0.1	7440-50-8

IPCI C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-06 [I]; C22C0038-58 [I]
IPCR C22C0038-00 [I]; C21D0009-48 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength manuf automobile part
IT Automobile parts
    Casting of metals
    Cold rolling
    Cooling
    Elongation, mechanical
    Heating
    Hot rolling
    Melting
    Microstructure
    Pickling
    Quenching (cooling)
    Sheet materials
    Tensile strength
    Yield strength
      (high strength steel sheet and its manuf. for automobile parts)
IT Forging
      (hot; high strength steel sheet and its manuf. for automobile parts)
IT 2135697-12-8P
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
      (high strength steel sheet and its manuf. for automobile parts)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L12 ANSWER 65 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:1052138 CAPLUS Full-text
DOCUMENT NUMBER: 167:166695
TITLE: Formula of steel for military high-pressure gas cylinder
INVENTOR(S): Wu, Chuanmin; Xu, Jinyuan; Xu, Sangbo; Lu, Hongdi
PATENT ASSIGNEE(S): Zhejiang Jindun Firefighting Equipment Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 7pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 106893935	A	20170627	CN 2017-10196443	20170329

PRIORITY APPLN. INFO.: CN 2017-10196443 20170329
AB The compn. of the steel for military high-pressure gas cylinder contains

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C 0.30-0.37, Si ≤0.40, Mn 0.60-0.90, P ≤0.020, S ≤0.020, Cr 0.90-1.20, Ni ≤0.3, Mo 0.15-0.30, Cu ≤0.20, Nb+V+Ti+B+Zr ≤0.15wt% and Fe bal. The steel for military high-pressure gas cylinder has higher corrosion resistance, and is practical.

IT 2102689-28-9, Carbon 0.3-0.4, chromium 0.9-1.2, copper 0-0.2, iron bal., manganese 0.6-0.9, molybdenum 0.2-0.3, nickel 0-0.3, niobium 0-0.2, V 0-0.2, Ti 0-0.2, B 0-0.2, Zr 0-0.2, silicon 0-0.4
RL: TEM (Technical or engineered material use); USES (Uses)
(formula of steel for military high-pressure gas cylinder)

RN 2102689-28-9 CAPLUS

CN Iron alloy, base, Fe 95-98,Cr 0.9-1.2,Mn 0.6-0.9,C 0.3-0.4,Si 0-0.4,Mo 0.2-0.3,Ni 0-0.3,B 0-0.2,Cu 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Cr	0.9	-	1.2	7440-47-3
Mn	0.6	-	0.9	7439-96-5
C	0.3	-	0.4	7440-44-0
Si	0	-	0.4	7440-21-3
Mo	0.2	-	0.3	7439-98-7
Ni	0	-	0.3	7440-02-0
B	0	-	0.2	7440-42-8
Cu	0	-	0.2	7440-50-8
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-04; C22C0038-02; C22C0038-22; C22C0038-20; C22C0038-44; C22C0038-42; C22C0038-24; C22C0038-26; C22C0038-28; C22C0038-32; C22C0038-46; C22C0038-48; C22C0038-50; C22C0038-54

IPCR C22C0038-04 [I]; C22C0038-02 [I]; C22C0038-20 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-42 [I]; C22C0038-44 [I]; C22C0038-46 [I]; C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-54 [I]

CC 55-12 (Ferrous Metals and Alloys)

ST military high pressure gas cylinder steel corrosion resistance

IT Cylinders
(gas; formula of steel for military high-pressure gas cylinder)

IT 2102689-28-9, Carbon 0.3-0.4, chromium 0.9-1.2, copper 0-0.2, iron bal., manganese 0.6-0.9, molybdenum 0.2-0.3, nickel 0-0.3, niobium 0-0.2, V 0-0.2, Ti 0-0.2, B 0-0.2, Zr 0-0.2, silicon 0-0.4
RL: TEM (Technical or engineered material use); USES (Uses)
(formula of steel for military high-pressure gas cylinder)

L12 ANSWER 66 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2017:1035509 CAPLUS Full-text

DOCUMENT NUMBER: 167:130838

TITLE: Carbon steel strips for reinforcing rubber motor vehicle tires

INVENTOR(S): Verleene, Arnaud

PATENT ASSIGNEE(S): Compagnie Generale des Etablissements Michelin, Fr.; Michelin Recherche et Technique S.A.

SOURCE: PCT Int. Appl., 32pp.; Chemical Indexing Equivalent to 167:130837 (FR)
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2017103516	A1	20170622	WO 2016-FR53485		20161216
FR 3045670	A1	20170623	FR 2015-62493		20151216
PRIORITY APPLN. INFO.:			FR 2015-62493	A	20151216

AB A narrow carbon steel strip with a very low carbon content, high

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resistance in the cold-worked state, comprises, in wt.: 0.05-0.4% carbon; 0.5-4% manganese, 0.1-2.5% silicon, optionally 0-1.5% aluminum, 0-0.5% of each of B, Cr, Co, Cu, Mo, Ni, Nb, Ti, W, V, and/or Zr, and/or 0-0.05% of each of P, S, N, and/or rare earth metal, the remainder consisting of iron and inevitable impurities. The microstructure of the cold-worked carbon steel is primarily martensitic or ferritic-martensitic. The resistance of the strip is greater than 1200 MPa, and its elongation at break is 1-5%. The carbon steel strips may be used as reinforcement in rubber composites such as for motor vehicle tires.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARNAUD JEAN-CLAUDE	1992			WO 9214811 A1	CAPLUS
ARNAUD JEAN-CLAUDE	1997			WO 9726379 A1	CAPLUS
KUSINSKI GRZEGORZ J	2004			WO 2004046400 A1	CAPLUS
THOMAS GARETH	1986			WO 8601231 A1	CAPLUS

IT 2101768-32-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; carbon steel strips for reinforcing rubber motor vehicle tires)

RN 2101768-32-3 CAPLUS

CN Iron alloy, base, Fe 86-99,Mn 0.5-4,Si 0.1-2.5,Al 0-1.5,B 0-0.5,Co 0-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Nb 0-0.5,Ni 0-0.5,Ti 0-0.5,V 0-0.5,W 0-0.5,Zr 0-0.5,C 0-0.4 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	86 - 99	7439-89-6
Mn	0.5 - 4	7439-96-5
Si	0.1 - 2.5	7440-21-3
Al	0 - 1.5	7429-90-5
B	0 - 0.5	7440-42-8
Co	0 - 0.5	7440-48-4
Cr	0 - 0.5	7440-47-3
Cu	0 - 0.5	7440-50-8
Mo	0 - 0.5	7439-98-7
Nb	0 - 0.5	7440-03-1
Ni	0 - 0.5	7440-02-0
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
W	0 - 0.5	7440-33-7
Zr	0 - 0.5	7440-67-7
C	0 - 0.4	7440-44-0

IPCI C21D0007-10 [I]; B32B0015-06 [I]; C21D0009-34 [I]; C21D0009-52 [I]; D07B0001-06 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]; B21B0001-28 [I]; C21D0009-46 [I]

IPCR C21D0007-10 [I]; B21B0001-28 [I]; B32B0015-06 [I]; C21D0009-34 [I]; C21D0009-46 [I]; C21D0009-52 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]; D07B0001-06 [I]

CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 39

ST carbon steel strip reinforced rubber tire

IT Tires
(carbon steel strips for reinforcing rubber motor vehicle tires)

IT Synthetic rubber
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(carbon steel-reinforced; carbon steel strips for reinforcing rubber motor vehicle tires)

IT 2101768-32-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; carbon steel strips for reinforcing rubber motor vehicle tires)

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Page 1230 of 1430

ACCESSION NUMBER: 2017:1035507 CAPLUS Full-text
DOCUMENT NUMBER: 167:130837
TITLE: Carbon steel strips for reinforcing rubber motor vehicle tires
INVENTOR(S): Verleene, Arnaud
PATENT ASSIGNEE(S): Compagnie Generale des Etablissements Michelin, Fr.; Michelin Recherche et Technique S.A.
SOURCE: Fr. Demande, 29pp.; Chemical Indexing Equivalent to 167:130838 (WO)
CODEN: FRXXBL
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 3045670	A1	20170623	FR 2015-62493	20151216
WO 2017103516	A1	20170622	WO 2016-FR53485	20161216

PRIORITY APPLN. INFO.: FR 2015-62493 A 20151216

AB A narrow carbon steel strip with a very low carbon content, high resistance in the cold-worked state, comprises, in wt.: 0.05-0.4% carbon; 0.5-4% manganese, 0.1-2.5% silicon, optionally 0-1.5% aluminum, 0-0.5% of each of B, Cr, Co, Cu, Mo, Ni, Nb, Ti, W, V, and/or Zr, and/or 0-0.05% of each of P, S, N, and/or rare earth metal, the remainder consisting of iron and inevitable impurities. The microstructure of the cold-worked carbon steel is primarily martensitic or ferritic-martensitic. The resistance of the strip is greater than 1200 MPa, and its elongation at break is 1-5%. The carbon steel strips may be used as reinforcement in rubber composites such as for motor vehicle tires.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARNAUD JEAN-CLAUDE	1992			WO 9214811 A1	CAPLUS
ARNAUD JEAN-CLAUDE	1997			WO 9726379 A1	CAPLUS
KUSINSKI GRZEGORZ J	2004			WO 2004046400 A1	CAPLUS
THOMAS GARETH	1986			WO 8601231 A1	CAPLUS

IT 2101768-32-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; carbon steel strips for reinforcing rubber motor vehicle tires)
RN 2101768-32-3 CAPLUS
CN Iron alloy, base, Fe 86-99,Mn 0.5-4,Si 0.1-2.5,Al 0-1.5,B 0-0.5,Co 0-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Nb 0-0.5,Ni 0-0.5,Ti 0-0.5,V 0-0.5,W 0-0.5,Zr 0-0.5,C 0-0.4 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	86 - 99	7439-89-6
Mn	0.5 - 4	7439-96-5
Si	0.1 - 2.5	7440-21-3
Al	0 - 1.5	7429-90-5
B	0 - 0.5	7440-42-8
Co	0 - 0.5	7440-48-4
Cr	0 - 0.5	7440-47-3
Cu	0 - 0.5	7440-50-8
Mo	0 - 0.5	7439-98-7
Nb	0 - 0.5	7440-03-1
Ni	0 - 0.5	7440-02-0
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
W	0 - 0.5	7440-33-7
Zr	0 - 0.5	7440-67-7
C	0 - 0.4	7440-44-0

IPCI C22C0038-04 [I]; B32B0025-04 [I]; B60C0009-18 [I]; B60C0001-00 [I]
IPCR C22C0038-04 [I]; B32B0025-04 [I]; B60C0001-00 [I]; B60C0009-18 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 39
ST carbon steel strip reinforced rubber tire

IT Tires
(carbon steel strips for reinforcing rubber motor vehicle tires)
IT Synthetic rubber
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(carbon steel-reinforced; carbon steel strips for reinforcing rubber motor vehicle tires)
IT 2101768-32-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; carbon steel strips for reinforcing rubber motor vehicle tires)

L12 ANSWER 68 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:1034863 CAPLUS Full-text
DOCUMENT NUMBER: 167:130836
TITLE: Tire reinforced by a carbon steel strip
INVENTOR(S): Verleene, Arnaud
PATENT ASSIGNEE(S): Compagnie Generale des Etablissements Michelin, Fr.; Michelin Recherche et Technique S.A.
SOURCE: Fr. Demande, 29pp.; Chemical Indexing Equivalent to 167:116100 (WO)
CODEN: FRXXBL
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 3045671	A1	20170623	FR 2015-62495	20151216
FR 3045671	B1	20171208		
WO 2017103515	A1	20170622	WO 2016-FR53484	20161216
EP 3390675	A1	20181024	EP 2016-825529	20161216
US 20200290401	A1	20200917	US 2018-16062765	20180615

PRIORITY APPLN. INFO.: FR 2015-62495 A 20151216
WO 2016-FR53484 W 20161216
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A motor vehicle tire is reinforced by at least one carbon steel strip that has a low carbon content and high resistance in the cold-worked state. The steel comprises (in % by wt.) 0.05-0.4% carbon, 0.5-4% manganese, 0.1-2.5% silicon, optionally 0-1.5% aluminum, 0-0.5% of each of boron, chromium, cobalt, copper, molybdenum, nickel, niobium, titanium, tungsten, vanadium, zirconium, and 0-0.05% of each of phosphorus, sulfur, nitrogen or rare earth metal, the remainder consisting of iron and inevitable impurities resulting from the process. The microstructure of the cold-worked carbon steel is primarily martensitic or ferritic-martensitic; the tensile strength of the strip is >1200 MPa, and its elongation at break is 1-5%.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARNAUD JEAN-CLAUDE	1992			WO 9214811 A1	CAPLUS
ARNAUD JEAN-CLAUDE	1997			WO 9726379 A1	CAPLUS
KUSINSKI GRZEGORZ J	2004			WO 2004046400 A1	CAPLUS
OBLATH RICHARD MICHAEL	1985			EP 0157716 A1	
THOMAS GARETH	1986			WO 8601231 A1	CAPLUS

IT 2101768-32-3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tire reinforced by carbon steel strip)
RN 2101768-32-3 CAPLUS
CN Iron alloy, base, Fe 86-99,Mn 0.5-4,Si 0.1-2.5,Al 0-1.5,B 0-0.5,Co 0-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Nb 0-0.5,Ni 0-0.5,Ti 0-0.5,V 0-0.5,W 0-0.5,Zr 0-0.5,C 0-0.4 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	86 - 99	7439-89-6

Mn	0.5	-	4	7439-96-5
Si	0.1	-	2.5	7440-21-3
Al	0	-	1.5	7429-90-5
B	0	-	0.5	7440-42-8
Co	0	-	0.5	7440-48-4
Cr	0	-	0.5	7440-47-3
Cu	0	-	0.5	7440-50-8
Mo	0	-	0.5	7439-98-7
Nb	0	-	0.5	7440-03-1
Ni	0	-	0.5	7440-02-0
Ti	0	-	0.5	7440-32-6
V	0	-	0.5	7440-62-2
W	0	-	0.5	7440-33-7
Zr	0	-	0.5	7440-67-7
C	0	-	0.4	7440-44-0

IPCI C22C0038-04 [I]; B32B0025-04 [I]; B60C0009-18 [I]; B60C0001-00 [I]
IPCR C22C0038-04 [I]; B32B0025-04 [I]; B60C0001-00 [I]; B60C0009-18 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 39
ST tire reinforced carbon steel strip mech property
IT Microstructure
Tire cords
(tire reinforced by carbon steel strip)
IT 2101768-32-3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tire reinforced by carbon steel strip)

L12 ANSWER 69 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:1034861 CAPLUS Full-text
DOCUMENT NUMBER: 167:116100
TITLE: Tire reinforced by a carbon steel strip
INVENTOR(S): Verleene, Arnaud
PATENT ASSIGNEE(S): Compagnie Generale des Etablissements Michelin, Fr.; Michelin Recherche et Technique S.A.
SOURCE: PCT Int. Appl., 34pp.; Chemical Indexing Equivalent to 167:130836 (FR)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2017103515	A1	20170622	WO 2016-FR53484	20161216
FR 3045671	A1	20170623	FR 2015-62495	20151216
FR 3045671	B1	20171208		
EP 3390675	A1	20181024	EP 2016-825529	20161216
US 20200290401	A1	20200917	US 2018-16062765	20180615

PRIORITY APPLN. INFO.: FR 2015-62495 A 20151216
WO 2016-FR53484 W 20161216
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Disclosed is a motor vehicle tire reinforced by at least one carbon steel strip that has a low carbon content and high resistance in the cold-worked state. The steel comprises (in % by wt.) 0.05% to 0.4% carbon, 0.5% to 4% manganese, 0.1% to 2.5% silicon, optionally (i) \<1.5% aluminum, (ii) \<0.5% of each of the metals boron, chromium, cobalt, copper, molybdenum, nickel, niobium, titanium, tungsten, vanadium, zirconium, et (iii) \<0.05% of each of the elements phosphorus, sulfur, nitrogen or rare earth metal, the remainder consisting of iron and inevitable impurities resulting from the process. The microstructure of the cold-worked carbon steel is primarily martensitic or ferritic-martensitic; the tensile strength Rm of the strip is greater than 1200 MPa, and its elongation at break At ranges from 1% to 5%.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARNAUD JEAN-CLAUDE	1992			WO 9214811 A1	CAPLUS
ARNAUD JEAN-CLAUDE	1997			WO 9726379 A1	CAPLUS

KUSINSKI GRZEGORZ J |2004 | | |WO 2004046400 A1 |CAPLUS
OBLATH RICHARD MICHAEL |1985 | | |EP 0157716 A1 |
THOMAS GARETH |1986 | | |WO 8601231 A1 |CAPLUS

IT 2101768-32-3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tire reinforced by carbon steel strip)

RN 2101768-32-3 CAPLUS

CN Iron alloy, base, Fe 86-99,Mn 0.5-4,Si 0.1-2.5,Al 0-1.5,B 0-0.5,Co 0-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Nb 0-0.5,Ni 0-0.5,Ti 0-0.5,V 0-0.5,W 0-0.5,Zr 0-0.5,C 0-0.4 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	86 - 99	7439-89-6
Mn	0.5 - 4	7439-96-5
Si	0.1 - 2.5	7440-21-3
Al	0 - 1.5	7429-90-5
B	0 - 0.5	7440-42-8
Co	0 - 0.5	7440-48-4
Cr	0 - 0.5	7440-47-3
Cu	0 - 0.5	7440-50-8
Mo	0 - 0.5	7439-98-7
Nb	0 - 0.5	7440-03-1
Ni	0 - 0.5	7440-02-0
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
W	0 - 0.5	7440-33-7
Zr	0 - 0.5	7440-67-7
C	0 - 0.4	7440-44-0

IPCI C21D0007-10 [I]; B60C0009-00 [I]; B21B0001-28 [I]; B32B0015-06 [I]; C21D0009-34 [I]; C21D0009-46 [I]; C21D0009-52 [I]; D07B0001-06 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]
IPCR C21D0007-10 [I]; B21B0001-28 [I]; B32B0015-06 [I]; B60C0009-00 [I]; C21D0009-34 [I]; C21D0009-46 [I]; C21D0009-52 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]; D07B0001-06 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST tire reinforced carbon steel strip mech property
IT Mechanical properties
Microstructure
Tire cords
(tire reinforced by carbon steel strip)
IT 2101768-32-3
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tire reinforced by carbon steel strip)

L12 ANSWER 70 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:848898 CAPLUS Full-text
TITLE: Contact Fatigue Resistance of Carburized Gears from Chromium-Nickel Steels
AUTHOR(S): Rudenko, S. P.; Val'ko, A. L.
CORPORATE SOURCE: United Institute for Mechanical Engineering, National Academy of Sciences of Belarus, Minsk, Belarus
SOURCE: Metal Science and Heat Treatment (2017), 59(1-2), 60-64
CODEN: MHTRAN; ISSN: 0026-0673
DIGITAL OBJECT ID: 10.1007/s11041-017-0103-3
PUBLISHER: Springer
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English

AB The contact fatigue resistance of carburized gears produced from chromium-nickel steels is studied. The curves of deep contact fatigue of the material of the gears are plotted in terms of the criterion of equality of the characteristics of diffusion layers. An expression for ultimate deep contact fatigue resistance of carburized gears is derived.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File

ArcelorMittal Ex. 2001
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IPR2024-01376

Anon				A A Susin, Thermoche	
Anon				A I Petrusevich, Con	
Anon				A N Utkina, Yu Yu Ch	
Anon				B A Balashov, R R Ga	
Anon				B V Gold, E P Obolen	
Anon				E B Vulgakov (ed.),	
Anon				E I Tesker, Advanced	
Anon				N M Ryzhov, "Technol	
Anon				S P Rudenko and A L	
Anon				S P Rudenko, "A stud	
Anon				S P Rudenko, "Comput	
Anon				S P Rudenko, "Fatigu	
Anon				S P Rudenko, A L Val	
Anon				V E Antonyuk, B V Iv	
Anon				Yu S Eliseev, V V Kr	

IT INDEXING IN PROGRESS
IT 37312-00-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(contact fatigue resistance of carburized gears from chromium-nickel steels)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST chromium nickel steel carburized gear contact fatigue resistance
IT Diffusion
Fatigue resistance
Gears
Microhardness
Microstructure
(contact fatigue resistance of carburized gears from chromium-nickel steels)
IT 12681-03-7 12742-08-4 37312-00-8 39411-21-7
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(contact fatigue resistance of carburized gears from chromium-nickel steels)

L12 ANSWER 71 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:342418 CAPLUS Full-text
DOCUMENT NUMBER: 166:297159
TITLE: Method for manufacturing steel plate with aluminum or aluminum alloy coating by hot stamping
INVENTOR(S): Liu, Xin; Hong, Zhenjun; Tan, Ning; Jin, Xinyan; Liu, Junxiang; Hong, Jiyao
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 15pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent

LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 106466697	A	20170301	CN 2016-10664566	20160812
CN 106466697	B	20200131		

PRIORITY APPLN. INFO.: CN 2016-10664566 20160812

AB The invention discloses a manuf. method of steel plate, which comprises the following steps: blanking the steel plate with aluminum or aluminum alloy coating by blanking or laser cutting, induction heating, hot stamping in die, and cooling. The temp. and time of heating are detd. by the thickness of steel plate. The components of the steel plate is as follows: C 0.08-0.8%, Si 0.05-1.0%, Mn 0.1-5%, P<0.3%, S<0.1%, Al<0.3%, Ti<0.5%, B 0.0005-0.1%, Cr 0.01-3%, and balance of Fe and inevitable impurities. The coating comprises alloy layer, aluminum enriched intermetallic compd. layer, intermediate layer and surface layer. The components of the alloy layer is Si 0-6%, Fe 75-96%, Al 2-12%; the components of the aluminum enriched intermetallic compd. layer is Si 0-2%, Fe 30-50%, Al 40-60%; the components of the intermediate layer is Si 2-6%, Fe 50-65%, Al 20-35%; and the components of the surface layer is Si 2-6%, Fe 50-65%, Al 20-35%. The product has high strength, complex shape, good formability, high precision, and small springback, which can be used for automobile parts such as bumper, pillar reinforced plate, floor inside passage, and stiffening beam, etc..

IT 2067242-22-0P, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

RN 2067242-22-0 CAPLUS
CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B21D0053-88; C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-32; C22C0038-60; C23C0002-12; C23C0002-40
IPCR B21D0053-88 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-32 [I]; C22C0038-60 [I]; C23C0002-12 [I]; C23C0002-40 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST hot stamping aluminum alloy steel plate coating manuf
IT Coating materials
Cooling
Induction heating
Industrial manufacturing
Laser cutting
Quenching (cooling)
Transmissions (mechanical)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)
IT Metalworking
(stamping, hot; method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)
IT 2067242-22-0P, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal. 2087430-40-6P, Aluminum 2-12, iron

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IPR2024-01376

75-96, silicon 0-6 2087430-41-7P, Aluminum 40-60, iron 30-50, silicon 0-2 2087430-42-8P, Aluminum 20-35, iron 50-65, silicon 2-6
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT 2087430-39-3, Iron 0-4, silicon 5-11, Aluminum bal.
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT 7429-90-5, Aluminum, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

L12 ANSWER 72 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:227313 CAPLUS Full-text
DOCUMENT NUMBER: 166:249360
TITLE: Hot rolled steel sheet and its manufacture for automobile parts
INVENTOR(S): Sakakibara, Chikami; Sugiura, Natsuko; Tanaka, Yasuaki; Tanei, Hiroshi; Fujii, Takashi; Yokoyama, Takashi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2017031454	A	20170209	JP 2015-150831	20150730
JP 6620446	B2	20191218		
WO 2017022025	A1	20170209	WO 2015-JP71845	20150731

PRIORITY APPLN. INFO.: JP 2015-150831 T0 20150730

AB To provide hot-rolled steel plate excellent in pickling property and without an increase in equipment cost, generation of internal oxide layer of a high strength hot rolled steel sheet contg. relatively large amts. of Si and Mn is suppressed, and method for manufg. thereof. Hot-rolled steel plate comprises C: 0.04-0.6%, Si: 0.01-3%, Mn: 0.1-5%, P: 0.04% or less, S: 0.05% or less, Al: 0.001-2%, N: 0.01% or less, O: 0.01% or less, one or more of Sb, Sn and Te: total amt. of 0.01-0.3% and remainder of Fe and unavoidable impurities, and has thickness of the internal oxide layer of 5 μm or less, a concd. layer of Sb, Sn and Te as an upper layer of the internal oxide layer, and has mech. properties with a tensile strength of 590 MPa or more.

IT 2079034-18-5P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high strength hot rolled steel sheet and its manuf. for automobile parts)

RN 2079034-18-5 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.1-5,Si 0-3,Al 0-2,Cr 0-2,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.6,Nb 0-0.3,Sb 0-0.3,Sn 0-0.3,Te 0-0.3,Ti 0-0.3,V 0-0.3,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Si	0	-	3	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Mo	0	-	1	7439-98-7
C	0	-	0.6	7440-44-0

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    Nb      0   -   0.3      7440-03-1
    Sb      0   -   0.3      7440-36-0
    Sn      0   -   0.3      7440-31-5
    Te      0   -   0.3     13494-80-9
    Ti      0   -   0.3      7440-32-6
    V       0   -   0.3      7440-62-2
    B       0   -   0.1      7440-42-8

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C22C0038-00 [I];
     C22C0038-60 [I]; C21D0009-46 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-60 [I]
CC   55-3 (Ferrous Metals and Alloys)
ST   hot rolled steel sheet manuf automobile part
IT   Automobile parts
     Casting of metals
     Hot rolling
     Melting
     Microstructure
     Pickling
     Sheet materials
     Tensile strength
        (high strength hot rolled steel sheet and its manuf. for
        automobile parts)
IT   2079034-18-5P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (high strength hot rolled steel sheet and its manuf. for
        automobile parts)
OS.CITING REF COUNT:     1     THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
                               (1 CITINGS)


L12  ANSWER 73 OF 398  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2017:100416  CAPLUS Full-text
DOCUMENT NUMBER:         166:179501
TITLE:                   Steel welding part with aluminum or aluminum alloy
                         plating layer and manufacture method thereof
INVENTOR(S):             Pan, Hua; Su, Yongchao; Lei, Ming; Shi, Lei; Jiang,
                         Haomin
PATENT ASSIGNEE(S):      Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE:                  Faming Zhuanli Shenqing, 8pp.
                         CODEN: CNXXEV
DOCUMENT TYPE:           Patent
LANGUAGE:                Chinese
FAMILY ACC. NUM. COUNT:  2
PATENT INFORMATION:
     PATENT NO.          KIND  DATE        APPLICATION NO.          DATE
     ----------------    ----  --------    ---------------------    --------
     CN 106334875         A    20170118    CN 2016-10953787         20161027
     WO 2018077067        A1   20180503    WO 2017-CN106516         20171017
     MX 2019004121        A    20190606    MX 2019-4121             20171017
     KR 2019069471        A    20190619    KR 2019-7013481          20171017
     EP 3533558           A1   20190904    EP 2017-864438           20171017
     JP 2019535894        T    20191212    JP 2019-520992           20171017
     US 20200038998       A1   20200206    US 2019-16339215         20190403
     IN 201917015151      A    20190719    IN 2019-17015151         20190415
PRIORITY APPLN. INFO.:                      CN 2016-10953787     A   20161027
                                            WO 2017-CN106516     W   20171017
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB   The invention discloses a steel welding part with aluminum or aluminum
     alloy plating layer and manuf. method thereof.  The steel welding part
     with aluminum or aluminum alloy plating layer comprises a steel
     substrate and a plating layer, the plating layer comprises an
     intermetallic compd. alloy layer in contact with the substrate, and a
     metal alloy layer thereon; which is characterized in that on at least one
     of the plated surfaces of the weld blank, the plating layer located in the
     area to be welded of the weld blank is completely removed, and the end
     face of the welding blank part plating layer removed the region to be
     welded is perpendicular to the surface of the substrate which is parallel
     to weld seam to form an included angle β, and the included angle
     β =0-80°.  A method of manufg. steel welding part with
     aluminum or aluminum alloy plating layer is characterized in that it
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includes the steps of: obtaining weld blank by welding according to the requirements of steel welding part with aluminum or aluminum alloy plating layer, welding the area to be welded of the weld blank where the plating layer has been completely removed to form a welded joint; obtaining a part by hot stamping, selecting a cooling rate which is greater than the crit. transformation speed of the matrix martensite quenching, and cooling. This invention ensures tensile strength, elongation rate and corrosion resistance of welding joint after hot stamping.

IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

RN 2067242-22-0 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B23K0026-32; C22C0038-04; C22C0038-02; C22C0038-06; C22C0038-14; C22C0038-18; C23C0002-12; B23K0103-20

IPCR B23K0026-32 [I]; B23K0103-20 [N]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-14 [I]; C22C0038-18 [I]; C23C0002-12 [I]

CC 56-9 (Nonferrous Metals and Alloys)
Section cross-reference(s): 47

ST steel welding part aluminum alloy plating layer

IT Metalworking
(stamping, hot; steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

IT Corrosion-resistant materials
Industrial manufacturing
Joints, mechanical
Laser ablation
Laser welding
Plating process
Welding apparatus
Welds
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

IT 12003-42-8 12004-62-5 12043-58-2
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

IT 1273096-81-3P, Aluminum alloy
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD

(2 CITINGS)

L12 ANSWER 74 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:24305 CAPLUS Full-text
DOCUMENT NUMBER: 166:137133
TITLE: High-strength carbon steel plate having excellent impact resistance and its production for automobile parts
INVENTOR(S): Okamoto, Riki; Toyota, Takeshi; Isogai, Eiji
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2017002333	A	20170105	JP 2015-114026	20150604
JP 6540245	B2	20190710		

PRIORITY APPLN. INFO.: JP 2015-114026 20150604

AB The invention provides a high-strength steel plate which has tensile strength of 400 N/mm2, excellent shape freezing property, and appropriate yield point elongation, and a method of manufg. thereof. The high-strength steel plate having excellent shape freezing property contains in mass%, C: 0.03-0.35%, Si: 0.01-2.00%, Mn: 0.3-4.0%, P: 0.001-0.100%, S: 0.0005-0.05%, N: 0.0005%-0.010%, Al: 0.01-2.00%, and balance being Fe and inevitable impurities, and includes a metal structure contg. an unrecrystd. ferrite phase at an area ratio of 2-35%. The yield point elongation of the steel plate is 4-10%.

IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength carbon steel plate having excellent impact resistance and its prodn. for automobile parts)
RN 2034133-38-3 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.3-4,Cr 0-3,Cu 0-3,Ni 0-3,Al 0-2,Si 0-2,Mo 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	100	7439-89-6
Mn	0.3	-	4	7439-96-5
Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Ni	0	-	3	7440-02-0
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
Mo	0	-	1	7439-98-7
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon steel plate strength impact resistance prodn automobile part
IT Annealing
Automobile parts
Cold rolling
Cooling
Elongation at break
Heating
Hot rolling
Hot-dip galvanizing
Impact strength

Microstructure
Pickling
Tensile strength
Yield strength
(high-strength carbon steel plate having excellent impact resistance and its prodn. for automobile parts)
IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength carbon steel plate having excellent impact resistance and its prodn. for automobile parts)

L12 ANSWER 75 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:24289 CAPLUS Full-text
DOCUMENT NUMBER: 166:148201
TITLE: High-strength carbon steel sheet with excellent processability and its manufacture for automobile parts
INVENTOR(S): Okamoto, Riki; Toyota, Takeshi; Isogai, Eiji
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 19pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2017002332	A	20170105	JP 2015-114025	20150604
JP 6620431	B2	20191218		
PRIORITY APPLN. INFO.:			JP 2015-114025	20150604

AB The high-strength steel sheet with excellent processability, contains in mass%, carbon:0.03-0.35%, silicon:0.01-2.00%, manganese:0.3-4.0%, phosphorus:0.001-0.100%, sulfur:0.0005-0.05%, nitrogen: 0.0005%-0.010%, aluminum: 0.01-2.00%, and balance being iron and inevitable impurities and includes a metal structure contg. an unrecrystd. ferrite phase at an area ratio of 2-20%. The ratio (yield stress (N/mm2)/tensile strength (Nmm2) of the yield stress with respect to the tensile strength is 0.75 or more. The product (yield stress(N/mm2)×elongation (%)) of yield stress and elongation is 12000 or more. The invention provides a high-strength steel sheet which has tensile strength of 400 N/mm<2, excellent processability, high elongation rate and high yield stress.
IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength carbon steel sheet with excellent processability and its manuf. for automobile parts)
RN 2034133-38-3 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.3-4,Cr 0-3,Cu 0-3,Ni 0-3,Al 0-2,Si 0-2,Mo 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	100	7439-89-6
Mn	0.3	-	4	7439-96-5
Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Ni	0	-	3	7440-02-0
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
Mo	0	-	1	7439-98-7
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]

IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST high strength steel sheet processability manuf automobile part
IT Metalworking
(capability; high-strength carbon steel sheet with excellent processability and its manuf. for automobile parts)
IT Alloying
Annealing
Automobile parts
Casting of metals
Cold rolling
Cooling
Elongation, mechanical
Hot rolling
Hot-dip galvanizing
Microstructure
Phase composition
Pickling
Sheet materials
Tensile strength
Yield strength
(high-strength carbon steel sheet with excellent processability and its manuf. for automobile parts)
IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-strength carbon steel sheet with excellent processability and its manuf. for automobile parts)

L12 ANSWER 76 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:2049760 CAPLUS Full-text
DOCUMENT NUMBER: 167:333389
TITLE: Method for hot forming a coated metal part and formed part
INVENTOR(S): Verloop, Willem Cornelis; Van Genderen, Marc Jacco; Van Tol, Ronald Theodoor; Hensen, Guido Cornelis; Loiseaux, Jenny
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: U.S., No pp. given
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 9127329	B2	20150908	US 2013-13818041	20130220
US 20130153094	A1	20130620		
WO 2012028224	A1	20120308	WO 2011-EP3601	20110719

PRIORITY APPLN. INFO.: EP 2010-9041 A 20100831
WO 2011-EP3601 W 20110719
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A method for manufg. a coated part having very high mech. properties using hot forming techniques. The method includes: -providing an annealed steel strip or blank or pre-shaped part that was coated with a metal or metal alloy before the annealing -if a strip is provided, cutting a blank from the strip before or after the annealing -optionally forming a pre-shaped part from the blank -heating the blank or preshaped part to a temp. of 500° C. at an av. heating rate of 16° C./s or more -further heating the blank or pre-shaped part to a temp. between 700 and 1000° C. -hot forming the blank or preshaped part into a hot formed part -hardening the hot formed part. A method for manufg. a coated steel strip, blank or pre-shaped part, and a coated steel strip, blank or part and a hot formed part.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2009			DE 102008022400 A1	CAPLUS
Anon	2009			WO 2009021743 A1	CAPLUS
Anon	2009			WO 2009096351 A1	CAPLUS

Anon	2010			WO 2010005121 A1	CAPLUS
Anon	2010			WO 2010069588 A1	CAPLUS
Anon	2010			WO 2010085983 A1	CAPLUS
Anon	2010			EP 2177641 A1	CAPLUS
Anon	2002			"Glossary of Metallu	
Anon	2011			International Search	
Brandstatter	2011			US 20110045316 A1	CAPLUS
Hensen	2011			US 20110236719 A1	CAPLUS
Maki	2011			US 20110174418 A1	CAPLUS
Mehler	1962			US 3056694 A	CAPLUS
Oh	2008			US 20080286603 A1	CAPLUS
Thirion	2012			US 20120085467 A1	CAPLUS
Toki	2011			US 20110048585 A1	CAPLUS
Vlot	2010			US 20100026048 A1	CAPLUS

IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)
RN 1360605-36-2 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0
V	0 - 0.1	7440-62-2

IPCI C21D0008-02 [I]; C21D0009-46 [I]; C23C0002-06 [I]; C23C0002-40 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0008-04 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C23C0010-28 [I]; C23C0010-60 [I]; C21D0008-02 [I]; B32B0015-01 [I]
IPCR C21D0008-02 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0008-04 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C23C0010-28 [I]; C23C0010-60 [I]
NCL 001/001.000; 148/533.000; 148/330.000
CC 55-3 (Ferrous Metals and Alloys)
ST steel strip coating hot deformation
IT Plastic deformation
(hot; method for manuf. coated steel parts by hot forming)
IT 1360605-37-3
RL: TEM (Technical or engineered material use); USES (Uses)
(coating; method for manuf. coated steel parts by hot forming)
IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)

L12 ANSWER 77 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1997298 CAPLUS Full-text
DOCUMENT NUMBER: 167:180612
TITLE: Coated steel strips, methods of making the same, methods of using the same, stamping blanks prepared from the same, stamped products prepared from the same, and articles of manufacture which contain such a stamped product
INVENTOR(S): Drillet, Pascal; Spehner, Dominique; Kefferstein, Ronald
PATENT ASSIGNEE(S): Arcelormittal France, Fr.
SOURCE: U.S. Pat. Appl. Publ., No pp. given
CODEN: USXXCO

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20110165436	A1	20110707	US 2011-447777	20110318
WO 2008053273	A1	20080508	WO 2006-IB4019	20061030
EP 3290199	A1	20180307	EP 2017-192410	20061030
EP 3290199	B1	20190821		
EP 3290200	A1	20180307	EP 2017-192418	20061030
EP 3587104	A1	20200101	EP 2019-185736	20061030
EP 3587105	A1	20200101	EP 2019-185743	20061030
US 20130029172	A1	20130131	US 2012-13621015	20120915
US 9708683	B2	20170718		
US 20170260603	A1	20170914	US 2017-15606770	20170526
US 10550447	B2	20200204		
US 20190271055	A1	20190905	US 2019-16413774	20190516
US 10590507	B2	20200317		
US 20190271056	A1	20190905	US 2019-16413799	20190516
US 20190271057	A1	20190905	US 2019-16413825	20190516
US 20190271058	A1	20190905	US 2019-16414022	20190516
US 10597747	B2	20200324		
US 20190276912	A1	20190912	US 2019-16413729	20190516
US 10577674	B2	20200303		

PRIORITY APPLN. INFO.:		
WO 2006-IB4019	W	20061030
EP 2006-842403	A3	20061030
EP 2017-192410	A3	20061030
US 2011-447777	A3	20110318
US 2012-13621015	A1	20120915
US 2017-15606770	A1	20170526

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB Coated steel having a well defined and uniform thickness is useful and advantageous for prepg. products by hot stamping. Products prepd. by hot stamping such a steel are particularly advantageous when subjected to a subsequent spot welding step.

IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)

RN 1022915-01-0 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

INCL 428653000; 072342100; 072047000
IPCI B32B0015-01 [I]; B21D0022-00 [I]; C21D0009-46 [I]
IPCR B32B0015-01 [I]; B21D0022-00 [I]; C21D0009-46 [I]
NCL 428/653.000; 072/047.000; 072/342.100
CC 55-11 (Ferrous Metals and Alloys)
ST aluminum coated steel strip stamping article spot welding
IT Metalworking
(stamping; aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
IT 7429-90-5, Aluminum, uses 952598-91-3, Aluminum 87-90, iron 2-4, silicon 8-11
RL: NUU (Other use, unclassified); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)

IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)

L12 ANSWER 78 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1976821 CAPLUS Full-text
DOCUMENT NUMBER: 167:35538
TITLE: Low temperature hardenable steels with excellent machinability
INVENTOR(S): Valls, Isaac
PATENT ASSIGNEE(S): Valls Besitz GmbH, Germany
SOURCE: U.S. Pat. Appl. Publ., No pp. given
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20150118098	A1	20150430	US 2014-14399289	20141106
US 10077490	B2	20180918		
EP 2662462	A1	20131113	EP 2012-166948	20120507
WO 2013167580	A1	20131114	WO 2013-EP59471	20130507
US 20180363110	A1	20181220	US 2018-16052826	20180802

PRIORITY APPLN. INFO.:
EP 2012-166948 A 20120507
WO 2013-EP59471 W 20130507
US 2014-14399289 A1 20141106
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The present invention relates to the application of at least partially bainitic or interstitial martensitic heat treatments on steels, often tool steels or steels that can be used for tools. The first tranche of the heat treatment implying austenitization is applied so that the steel presents a low enough hardness to allow for advantageous shape modification, often trough machining. Thus a steel product is obtained which can be shaped with ease and whose hardness can be raised to a higher working hardness with a simple heat treatment at low temp. (below austenitization temp.).
IT 1478046-17-1 1478046-18-2 1478046-23-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(low temp. hardenable tool steels with excellent machinability)
RN 1478046-17-1 CAPLUS
CN Iron alloy, base, Fe 37-100,Mo 0-10,W 0-10,Co 0-6,Ni 0-6,V 0-4,Cr 0-3,Hf 0-3,Mn 0-3,Ta 0-3,Ti 0-3,Zr 0-3,Al 0-2.5,Cu 0-2,Nb 0-1.5,Si 0-1.4,N 0-1,B 0-0.6,C 0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	37 - 100	7439-89-6
Mo	0 - 10	7439-98-7
W	0 - 10	7440-33-7
Co	0 - 6	7440-48-4
Ni	0 - 6	7440-02-0
V	0 - 4	7440-62-2
Cr	0 - 3	7440-47-3
Hf	0 - 3	7440-58-6
Mn	0 - 3	7439-96-5
Ta	0 - 3	7440-25-7
Ti	0 - 3	7440-32-6
Zr	0 - 3	7440-67-7
Al	0 - 2.5	7429-90-5
Cu	0 - 2	7440-50-8
Nb	0 - 1.5	7440-03-1
Si	0 - 1.4	7440-21-3
N	0 - 1	17778-88-0
B	0 - 0.6	7440-42-8
C	0.2	7440-44-0

RN 1478046-18-2 CAPLUS
CN Iron alloy, base, Fe 13-100,Mo 0-15,W 0-15,Cr 0-14,V 0-12,Zr 0-12,Co 0-6,Ni 0-6,Hf 0-4,Nb 0-4,Ta 0-4,Ti 0-4,C 0.5-3,Mn 0-3,Al 0-2.5,N 0-2.2,B 0-2,Cu 0-2,Si 0-2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	13 - 100	7439-89-6
Mo	0 - 15	7439-98-7
W	0 - 15	7440-33-7
Cr	0 - 14	7440-47-3
V	0 - 12	7440-62-2
Zr	0 - 12	7440-67-7
Co	0 - 6	7440-48-4
Ni	0 - 6	7440-02-0
Hf	0 - 4	7440-58-6
Nb	0 - 4	7440-03-1
Ta	0 - 4	7440-25-7
Ti	0 - 4	7440-32-6
C	0.5 - 3	7440-44-0
Mn	0 - 3	7439-96-5
Al	0 - 2.5	7429-90-5
N	0 - 2.2	17778-88-0
B	0 - 2	7440-42-8
Cu	0 - 2	7440-50-8
Si	0 - 2	7440-21-3

RN 1478046-23-9 CAPLUS
CN Iron alloy, base, Fe 44-99,W 0-8,Co 0-6,Mo 0-6,Ni 0-6,Cr 0-4,V 0-4,Mn 0.2-3,Si 0.2-2.8,Al 0-2.5,Cu 0-2,Hf 0-2,Nb 0-2,Ta 0-2,Ti 0-2,Zr 0-2,C 0.2-0.9,B 0-0.6,N 0-0.6 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	44 - 99	7439-89-6
W	0 - 8	7440-33-7
Co	0 - 6	7440-48-4
Mo	0 - 6	7439-98-7
Ni	0 - 6	7440-02-0
Cr	0 - 4	7440-47-3
V	0 - 4	7440-62-2
Mn	0.2 - 3	7439-96-5
Si	0.2 - 2.8	7440-21-3
Al	0 - 2.5	7429-90-5
Cu	0 - 2	7440-50-8
Hf	0 - 2	7440-58-6
Nb	0 - 2	7440-03-1
Ta	0 - 2	7440-25-7
Ti	0 - 2	7440-32-6
Zr	0 - 2	7440-67-7
C	0.2 - 0.9	7440-44-0
B	0 - 0.6	7440-42-8
N	0 - 0.6	17778-88-0

INCL 420102000; 420111000; 420110000; 420109000; 420107000; 420106000; 420101000
IPCI C22C0038-58 [I]; C22C0038-50 [I]; C22C0038-52 [I]; C22C0038-38 [I]; C22C0038-32 [I]; C22C0038-02 [I]; C22C0038-28 [I]; C22C0038-26 [I]; C22C0038-24 [I]; C22C0038-22 [I]; C22C0038-04 [I]; C22C0038-44 [I]; C22C0038-30 [I]; C22C0038-12 [I]; C22C0038-22 [I]; C22C0038-44 [I]; C22C0038-58 [I]; C21D0009-00 [I]; C22C0038-18 [I]; C21D0006-00 [I]; C21D0001-30 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-30 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C22C0038-50 [I]; C22C0038-52 [I]; C22C0038-00 [I]; C22C0038-08 [I]; C22C0038-14 [I]
IPCR C22C0038-58 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I]; C22C0038-28 [I]; C22C0038-30 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C22C0038-44 [I]; C22C0038-50 [I]; C22C0038-52 [I]; C22C0038-12 [I]; C21D0001-30 [I]; C21D0006-00 [I];

C21D0009-00 [I]; C22C0038-00 [I]; C22C0038-08 [I]; C22C0038-14 [I];
C22C0038-18 [I]
NCL 420/102.000; 420/101.000; 420/106.000; 420/107.000; 420/109.000;
420/110.000; 420/111.000
CC 55-3 (Ferrous Metals and Alloys)
ST tool steel heat treatment hardness
IT Dies
Heat treatment
Injection molding apparatus
Tools
(low temp. hardenable tool steels with excellent
machinability)
IT 12173-93-2, Martensite, formation (nonpreparative) 12427-23-5, Bainite
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(low temp. hardenable tool steels with excellent
machinability)
IT 1478046-17-1 1478046-18-2 1478046-23-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(low temp. hardenable tool steels with excellent
machinability)

L12 ANSWER 79 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1976461 CAPLUS Full-text
DOCUMENT NUMBER: 167:35564
TITLE: Tough bainitic heat treatments on steels for tooling
INVENTOR(S): Valls Angles, Isaac
PATENT ASSIGNEE(S): Vallsbesitz GmbH, Germany
SOURCE: U.S. Pat. Appl. Publ., No pp. given
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20150114525	A1	20150430	US 2014-14399239	20141106
EP 2662460	A1	20131113	EP 2012-166949	20120507
WO 2013167628	A1	20131114	WO 2013-EP59542	20130507
PRIORITY APPLN. INFO.:			EP 2012-166949 A	20120507
			WO 2013-EP59542 W	20130507

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to a method that has been developed to obtain good toughness and homogeneous properties through heavy sections in tool steels or likely highly alloyed steels. The microstructure attained is mostly bainitic. The method is esp. good for hot work tool steels in applications demanding heavy sections and very high toughness. The method consists on the application of a low temp. bainitic transformation to tool steels presenting a low enough martensite transformation temp. (Ms). Addnl. or alternatively cementite is replaced from the bainite by other finer carbides, mainly mixed carbides contg. elements with stronger affinity for carbon than iron. The method is esp. simple if applied to steels with high contents of Si or Al (>1.3% and >0.4% resp.) where cementite growth is impaired. The method works also well for low cost plastic injection molding and structural steels. Even some higher alloyed tool steels can benefit from, the present method.
IT 1480228-53-2
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(tough bainitic heat treatment for tool steels)
RN 1480228-53-2 CAPLUS
CN Iron alloy, base, Fe 0-100,Mo 0-15,W 0-15,Cr 0-14,V 0-12,Zr 0-12,Co 0-6,Ni 0-6,Hf 0-4,Nb 0-4,Ta 0-4,Ti 0-4,C 0.5-3,Mn 0-3,Al 0-2.5,N 0-2.2,B 0-2,Cu 0-2,Si 0-2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	0 - 100	7439-89-6
Mo	0 - 15	7439-98-7
W	0 - 15	7440-33-7

Cr	0	-	14	7440-47-3
V	0	-	12	7440-62-2
Zr	0	-	12	7440-67-7
Co	0	-	6	7440-48-4
Ni	0	-	6	7440-02-0
Hf	0	-	4	7440-58-6
Nb	0	-	4	7440-03-1
Ta	0	-	4	7440-25-7
Ti	0	-	4	7440-32-6
C	0.5	-	3	7440-44-0
Mn	0	-	3	7439-96-5
Al	0	-	2.5	7429-90-5
N	0	-	2.2	17778-88-0
B	0	-	2	7440-42-8
Cu	0	-	2	7440-50-8
Si	0	-	2	7440-21-3

INCL 148612000; 148660000; 148663000; 148621000
IPCI C22C0038-58 [I]; C21D0001-00 [I]; C22C0038-54 [I]; C22C0038-50 [I];
C22C0038-48 [I]; C22C0038-46 [I]; C22C0038-44 [I]; C22C0038-38 [I];
C22C0038-28 [I]; C22C0038-26 [I]; C22C0038-24 [I]; C22C0038-22 [I];
C22C0038-04 [I]; C22C0038-02 [I]; C21D0006-00 [I]
IPCR C22C0038-58 [I]; C21D0001-00 [I]; C21D0006-00 [I]; C22C0038-02 [I];
C22C0038-04 [I]; C22C0038-22 [I]; C22C0038-24 [I]; C22C0038-26 [I];
C22C0038-28 [I]; C22C0038-38 [I]; C22C0038-44 [I]; C22C0038-46 [I];
C22C0038-48 [I]; C22C0038-50 [I]; C22C0038-54 [I]
NCL 148/612.000; 148/621.000; 148/660.000; 148/663.000
CC 55-5 (Ferrous Metals and Alloys)
ST tool steel bainite heat treatment hardness
IT Heat treatment
Mechanical hardness
Tools
(tough bainitic heat treatment for tool steels)
IT 12427-23-5, Bainite
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(tough bainitic heat treatment for tool steels)
IT 1480228-53-2
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(tough bainitic heat treatment for tool steels)

L12 ANSWER 80 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1976375 CAPLUS Full-text
DOCUMENT NUMBER: 167:35563
TITLE: High thermal diffusivity, high toughness and low crack risk during heat treatment tool steel
INVENTOR(S): Angles, Isaac Valls
PATENT ASSIGNEE(S): Rovalma, S.A., Spain
SOURCE: U.S. Pat. Appl. Publ., No pp. given
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 20160010168	A1	20160114	US 2015-14771976		20150901
WO 2014131907	A1	20140904	WO 2014-EP54010		20140228
PRIORITY APPLN. INFO.:			EP 2013-382069	A	20130301
			WO 2014-EP54010	W	20140228

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The present invention relates to a tool steel as described in WO2012095532A1 or WO2010112319A1 and its heat treatment where high levels of thermal diffusivity, mech. resistance, wear resistance and/or toughness are attained while having a low cracking risk during the heat treatment. It is achieved by austenitizing at a temp., normally above AC3, cooling to an intermediate temp. below AC1 and above the temp. where bainitic (and alike) transformation occurs and finally quenching with a severe cooling media to a temp. below the bainitic transformation nose. Final microstructure is mainly composed of martensite and/or lower bainite, which will generally be afterwards tempered.

IT 1625647-86-0
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tool steel; high thermal diffusivity, high toughness and low crack risk during heat treatment tool steel)
RN 1625647-86-0 CAPLUS
CN Iron alloy, base, Fe 36-100,Mo 0-10,W 0-10,Co 0-6,Ni 0-6,V 0-4,Cr 0-3,Hf 0-3,Mn 0-3,Ta 0-3,Zr 0-3,Al 0-2.5,Cu 0-2,Ti 0-2,C 0.2-1.9,Nb 0-1.5,Si 0-1.4,N 0-1,B 0-0.6 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	36	-	100	7439-89-6
Mo	0	-	10	7439-98-7
W	0	-	10	7440-33-7
Co	0	-	6	7440-48-4
Ni	0	-	6	7440-02-0
V	0	-	4	7440-62-2
Cr	0	-	3	7440-47-3
Hf	0	-	3	7440-58-6
Mn	0	-	3	7439-96-5
Ta	0	-	3	7440-25-7
Zr	0	-	3	7440-67-7
Al	0	-	2.5	7429-90-5
Cu	0	-	2	7440-50-8
Ti	0	-	2	7440-32-6
C	0.2	-	1.9	7440-44-0
Nb	0	-	1.5	7440-03-1
Si	0	-	1.4	7440-21-3
N	0	-	1	17778-88-0
B	0	-	0.6	7440-42-8

IPCI C21D0001-84 [I]; C22C0038-46 [I]; C22C0038-44 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-04 [I]; C22C0038-02 [I]; C21D0006-00 [I]; C22C0038-42 [I]
IPCR C21D0001-84 [I]; C21D0006-00 [I]; C22C0038-00 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-42 [I]; C22C0038-44 [I]; C22C0038-46 [I]
CC 55-5 (Ferrous Metals and Alloys)
ST tool steel thermal diffusivity toughness crack heat treatment
IT Structural phase transition
(ferrite-perlite; high thermal diffusivity, high toughness and low crack risk during heat treatment tool steel)
IT Fracture toughness
Heat treatment
Mechanical hardness
Microstructure
Quenching (cooling)
Tempering
Thermal conductivity
Wear resistance
(high thermal diffusivity, high toughness and low crack risk during heat treatment tool steel)
IT 12173-93-2, Martensite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(high thermal diffusivity, high toughness and low crack risk during heat treatment tool steel)
IT 1625647-86-0
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(tool steel; high thermal diffusivity, high toughness and low crack risk during heat treatment tool steel)

L12 ANSWER 81 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1809235 CAPLUS Full-text
DOCUMENT NUMBER: 165:597854
TITLE: High-strength steel plate and its manufacturing method
INVENTOR(S): Okamoto, Riki; Ishida, Yoshinari; Suwa, Yoshihiro; Yokoyama, Takafumi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

SOURCE: PCT Int. Appl., 67pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016178430	A1	20161110	WO 2016-JP63660	20160506
TW I606123	B	20171121	TW 2016-114295	20160506
KR 2017138545	A	20171215	KR 2017-7033656	20160506
KR 1987573	B1	20190610		
CN 107614722	A	20180119	CN 2016-80026467	20160506
CN 107614722	B	20190827		
EP 3293279	A1	20180314	EP 2016-789566	20160506
EP 3293279	B1	20200325		
MX 2017014094	A	20180316	MX 2017-14094	20160506
BR 112017023881	A2	20180717	BR 2017-112017023881	20160506
JP 6471800	B2	20190220	JP 2017-516621	20160506
ES 2784699	T3	20200930	ES 2016-789566	20160506
US 20180148809	A1	20180531	US 2017-15571619	20171103
IN 201717039616	A	20171222	IN 2017-17039616	20171107

PRIORITY APPLN. INFO.:
JP 2015-95157 A 20150507
JP 2015-95158 A 20150507
WO 2016-JP63660 W 20160506

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention relates to a high-strength steel plate that has a predetd. chem. compn. and has a microstructure represented by, in terms of area%, at least 5% martensite, at least 20% ferrite and, 5% or less pearlite. The av. grain diam. of the martensite is an equiv. circle diam. of 4 μm or less. Among multiple martensite grains on grain boundary triple points of a matrix phase, at least one of the grain boundaries that connect adjacent two grain boundary triple points that are structured by the martensite grains and the matrix crystal grains has convex curvature toward the outside with respect to a line segment that connects the two grain boundary triple points. Furthermore, if the martensite grain is referred to as a bulging martensite grain when the martensite grain is on one grain boundary triple point of the matrix phase, the ratio of the no. of bulging martensite grains to the no. of multiple martensite grains on the grain boundary triple points of the matrix phase is at least 70%. The area ratio represented by VM/A0 is at least 1.0, where VM represents the total area of the multiple martensite grains on the grain boundary triple points of the matrix phase, and A0 represents the total area of the polygons structured by line segments connecting any two adjacent grain boundary triple points of multiple martensite grains.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AKAMIZU HIROSHI	2004			JP 2004308002 A	CAPLUS
IBANO AKIRA	2010			JP 2010285636 A	CAPLUS
MINAMI HIDEKAZU	2015			WO 2015015738 A1	CAPLUS
OKAMOTO TSUTOMU	2014			JP 2014173151 A	CAPLUS
ONO YOSHIHIKO	2010			WO 2010087529 A1	CAPLUS
TAKASHIMA KATSUTOSHI	2015			WO 2015019558 A1	CAPLUS

IT 2034133-38-3
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength steel plate and its manufg. method)
RN 2034133-38-3 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.3-4,Cr 0-3,Cu 0-3,Ni 0-3,Al 0-2,Si 0-2,Mo 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	80 - 100	7439-89-6
Mn	0.3 - 4	7439-96-5
Cr	0 - 3	7440-47-3
Cu	0 - 3	7440-50-8
Ni	0 - 3	7440-02-0
Al	0 - 2	7429-90-5
Si	0 - 2	7440-21-3

Mo	0	-	1	7439-98-7
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C22C0038-00 [I]; C21D0009-46 [I]; C22C0018-00 [I]; C22C0038-60 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0018-00 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel plate martensite ferrite pearlite microstructure manufg method
IT Annealing
Automobile parts
Cooling
Elongation at break
Grain boundaries
Heating
Microstructure
Particle size
Rolling (metals)
Tensile strength
(high-strength steel plate and its manufg. method)
IT 15099-26-0, Argon (3+), uses
RL: NUU (Other use, unclassified); USES (Uses)
(high-strength steel plate and its manufg. method)
IT 12173-93-2, Martensite, uses 12427-24-6, Ferrite (ferrous metal component) 12427-27-9, Pearlite 2034133-38-3
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength steel plate and its manufg. method)

L12 ANSWER 82 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1777903 CAPLUS Full-text
DOCUMENT NUMBER: 165:562899
TITLE: Composition and manufacture of high-strength cold rolled steel plate with excellent workability and weldability
INVENTOR(S): Okamoto, Isamu; Yokoyama, Takashi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2016188395	A	20161104	JP 2015-68084	20150330
JP 6492869	B2	20190403		

PRIORITY APPLN. INFO.: JP 2015-68084 20150330
AB The present invention provides a high strength cold rolled steel plate with excellent weldability and workability, and a strength of 400 N/mm2 or more with high processability and yield stress, and its manufg. method. The high strength cold rolled steel plate contains C: 0.03%-0.35%, Si: 0.01%-2.00%, Mn: 0.3%-4.0%, P: 0.001%-0.100%, S: 0.0005%-0.05%, N: 0.0005%-0.010%, Al: 0.01%-2.00%, and the balance being Fe and inevitable impurities. The metal structure contains an unrecrystd. ferrite phase at an area ratio of more than 2% and less than 20%, and martensite phase and tempered martensite phase in an amt. of more than 5% and less than 60% in total. The yield ratio YR that is the ratio of the yield stress to the tensile strength is 0.7 or more, and the product of the yield stress and the elongation is 13000 or more.
IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of high-strength cold rolled steel plate with excellent workability and weldability)
RN 2034133-38-3 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.3-4,Cr 0-3,Cu 0-3,Ni 0-3,Al 0-2,Si 0-2,Mo 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	100	7439-89-6
Mn	0.3	-	4	7439-96-5
Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Ni	0	-	3	7440-02-0
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
Mo	0	-	1	7439-98-7
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C22C0038-00 [I];
C22C0038-60 [I]; C21D0009-46 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST cold rolled steel plate manuf strength workability weldability
IT Metalworking
(capability; compn. and manuf. of high-strength cold rolled steel plate with excellent workability and weldability)
IT Alloying
Annealing
Casting of metals
Cooling
Elongation at break
Hot rolling
Hot-dip galvanizing
Microstructure
Pickling
Recrystallization
Tensile strength
Weldability
Yield strength
(compn. and manuf. of high-strength cold rolled steel plate with excellent workability and weldability)
IT 2034133-38-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of high-strength cold rolled steel plate with excellent workability and weldability)

L12 ANSWER 83 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1770673 CAPLUS Full-text
DOCUMENT NUMBER: 165:549448
TITLE: Production of hot or cold strips from steel having high copper content
INVENTOR(S): Redenius, Alexander; Evertz, Thomas; Palzer, Peter
PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: PCT Int. Appl., 23pp.; Chemical Indexing Equivalent to 165:549447 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016174020	A1	20161103	WO 2016-EP59266	20160426
DE 102015106780	A1	20161103	DE 2015-102015106780	20150430

PRIORITY APPLN. INFO.: DE 2015-102015106780 A 20150430
AB A hot or cold strip of steel with high copper content, is manufd. by: melting a steel melt contg. (in wt.%) 0-0.4% C, 0-3% Mn, 0-2% Al, 0-2% Si, more than 0.8% Cu, 0-0.2% P, 0-0.05% S, and 0-0.3% N, with optional addn. of Sn, Ni, Cr, V, Nb, Ti, Mo, W, B, Co, Sb and/or Zr, the remainder being iron and unavoidable impurities; casting the melt under an atm.

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IPR2024-01376

having an oxygen content <10 vol.%, by a near-net-shape casting method, in particular horizontal strip casting or vertical casting according to the two-roll method, into a pre-strip having a thickness in of 1-30 mm; cooling the cast pre-strip at a cooling rate ≥100 K/s at the actively cooled strip surface until forming a rigid boundary layer.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
FANG YUAN	2014			US 20140366602 A1	
GUELTON NICOLAS PATRICE	2004			EP 1466024 A1	CAPLUS
IKI HIROSHI	2000			JP 2000045045 A	CAPLUS
IUNG THIERRY	2001			EP 1072689 A1	CAPLUS
MARUYAMA NAOKI	2005			JP 2005036271 A	CAPLUS
MIZOGUCHI TOSHIAKI NIPP	1995			EP 0641867 A1	CAPLUS
UENISHI AKIHIRO	2000			EP 0969112 A1	CAPLUS
YAMAKAWA TSUNAHIRO	1992			US 5098489 A	CAPLUS

IT 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)

RN 2031158-69-5 CAPLUS

CN Iron alloy, base, Fe 68-99,Cu 0.8-5,Cr 0-4,Co 0-3,Mn 0-3,Mo 0-3,W 0-3,Al 0-2,Ni 0-2,Si 0-2,Nb 0-0.9,Ti 0-0.9,V 0-0.9,Sn 0-0.5,Zr 0-0.5,C 0-0.4,B 0-0.3,N 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	68 - 99	7439-89-6
Cu	0.8 - 5	7440-50-8
Cr	0 - 4	7440-47-3
Co	0 - 3	7440-48-4
Mn	0 - 3	7439-96-5
Mo	0 - 3	7439-98-7
W	0 - 3	7440-33-7
Al	0 - 2	7429-90-5
Ni	0 - 2	7440-02-0
Si	0 - 2	7440-21-3
Nb	0 - 0.9	7440-03-1
Ti	0 - 0.9	7440-32-6
V	0 - 0.9	7440-62-2
Sn	0 - 0.5	7440-31-5
Zr	0 - 0.5	7440-67-7
C	0 - 0.4	7440-44-0
B	0 - 0.3	7440-42-8
N	0 - 0.3	17778-88-0
P	0 - 0.2	7723-14-0

IPCI C22C0038-00 [I]; B22D0011-00 [I]; B22D0011-06 [I]; B22D0011-106 [I]; B22D0011-124 [I]; B22D0011-14 [I]; B22D0011-22 [I]; B22D0015-00 [I]; B22D0037-00 [I]; C21D0006-00 [I]; C21D0008-02 [I]; C21D0001-26 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-16 [I]; B22D0011-112 [I]; C21D0006-02 [I]

IPCR C22C0038-00 [I]; B22D0011-00 [I]; B22D0011-06 [I]; B22D0011-106 [I]; B22D0011-112 [I]; B22D0011-124 [I]; B22D0011-14 [I]; B22D0011-22 [I]; B22D0015-00 [I]; B22D0037-00 [I]; C21D0001-26 [I]; C21D0006-00 [I]; C21D0006-02 [I]; C21D0008-02 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-16 [I]

CC 55-3 (Ferrous Metals and Alloys)

ST hot cold strip steel copper casting cooling

IT Annealing
Casting of metals
Cooling
Hot rolling
(prodn. of hot or cold strips from steel having high copper content)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)

(casting atm.; prodn. of hot or cold strips from steel having high copper content)
IT 2031158-68-4P 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)

L12 ANSWER 84 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1770568 CAPLUS Full-text
DOCUMENT NUMBER: 165:549447
TITLE: Production of hot or cold strips from steel having high copper content
INVENTOR(S): Redenius, Alexander; Evertz, Thomas; Palzer, Peter
PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: Ger. Offen., 9pp.; Chemical Indexing Equivalent to 165:549448 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102015106780	A1	20161103	DE 2015-102015106780	20150430
WO 2016174020	A1	20161103	WO 2016-EP59266	20160426

PRIORITY APPLN. INFO.: DE 2015-102015106780 A 20150430
AB A hot or cold strip of steel with high copper content, is manufd. by: melting a steel melt contg. (in wt.%) 0-0.4% C, 0-3% Mn, 0-2% Al, 0-2% Si, more than 0.8% Cu, 0-0.2% P, 0-0.05% S, and 0-0.3% N, with optional addn. of Sn, Ni, Cr, V, Nb, Ti, Mo, W, B, Co, Sb and/or Zr, the remainder being iron and unavoidable impurities; casting the melt under an atm. having an oxygen content <10 vol.%, by a near-net-shape casting method, in particular horizontal strip casting or vertical casting according to the two-roll method, into a pre-strip having a thickness in of 1-30 mm; cooling the cast pre-strip at a cooling rate ≥100 K/s at the actively cooled strip surface until forming a rigid boundary layer.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 112013001434 T5	CAPLUS
Anon				WO 2015003755 A1	CAPLUS
Anon				EP 2546368 A1	CAPLUS
Anon				DE 60306365 T2	
Anon	2013			M Bausch et al:Ultra	

IT 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)
RN 2031158-69-5 CAPLUS
CN Iron alloy, base, Fe 68-99,Cu 0.8-5,Cr 0-4,Co 0-3,Mn 0-3,Mo 0-3,W 0-3,Al 0-2,Ni 0-2,Si 0-2,Nb 0-0.9,Ti 0-0.9,V 0-0.9,Sn 0-0.5,Zr 0-0.5,C 0-0.4,B 0-0.3,N 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	68 - 99	7439-89-6
Cu	0.8 - 5	7440-50-8
Cr	0 - 4	7440-47-3
Co	0 - 3	7440-48-4
Mn	0 - 3	7439-96-5
Mo	0 - 3	7439-98-7
W	0 - 3	7440-33-7
Al	0 - 2	7429-90-5
Ni	0 - 2	7440-02-0
Si	0 - 2	7440-21-3
Nb	0 - 0.9	7440-03-1
Ti	0 - 0.9	7440-32-6

V	0	-	0.9	7440-62-2
Sn	0	-	0.5	7440-31-5
Zr	0	-	0.5	7440-67-7
C	0	-	0.4	7440-44-0
B	0	-	0.3	7440-42-8
N	0	-	0.3	17778-88-0
P	0	-	0.2	7723-14-0

IPCI C22C0038-04 [I]; C22C0038-16 [I]; C21D0008-00 [I]; B22D0011-06 [I]; B22D0011-116 [I]; B22D0011-12 [I]; C22C0111-00 [I]
IPCR C22C0038-04 [I]; B22D0011-06 [I]; B22D0011-116 [I]; B22D0011-12 [I]; C21D0008-00 [I]; C22C0038-16 [I]; C22C0111-00 [N]
CC 55-3 (Ferrous Metals and Alloys)
ST hot cold strip steel copper casting cooling
IT Annealing
Casting of metals
Cooling
Hot rolling
(prodn. of hot or cold strips from steel having high copper content)
IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(casting atm.; prodn. of hot or cold strips from steel having high copper content)
IT 2031158-68-4P 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)

L12 ANSWER 85 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1617614 CAPLUS Full-text
DOCUMENT NUMBER: 165:466273
TITLE: Composition and manufacture of carbon steel sheet suitable for hot stamping, and hot stamping molded parts
INVENTOR(S): Azuma, Masafumi; Suwa, Yoshihiro; Kondo, Yusuke; Sato, Koichi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 49pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016158961	A1	20161006	WO 2016-JP60145	20160329
CA 2979978	A1	20161006	CA 2016-2979978	20160329
KR 2017122823	A	20171106	KR 2017-7027982	20160329
KR 2000863	B1	20190716		
CN 107427889	A	20171201	CN 2016-80017529	20160329
CN 107427889	B	20191025		
MX 2017012377	A	20171214	MX 2017-12377	20160329
EP 3278895	A1	20180207	EP 2016-772842	20160329
EP 3278895	B1	20200311		
BR 112017020165	A2	20180605	BR 2017-112017020165	20160329
RU 2683397	C1	20190328	RU 2017-135379	20160329
JP 6515356	B2	20190522	JP 2017-510030	20160329
ES 2781465	T3	20200902	ES 2016-772842	20160329
TW I597370	B	20170901	TW 2016-110064	20160330
US 20180044754	A1	20180215	US 2017-15559731	20170919
IN 201717033300	A	20171201	IN 2017-17033300	20170920
PRIORITY APPLN. INFO.:			JP 2015-72280 A	20150331
			WO 2016-JP60145 W	20160329

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A steel sheet for hot stamping contains, in percentage by wt., C: 0.100%-0.600%, Si: 0.50%-3.00%, Mn: 1.20%-4.00%, Ti: 0.005%-0.100%, B: 0.0005%-0.100%, P: 0.100% or less, S: 0.0001%-0.0100%, Al: 0.005%-1.000%,

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IPR2024-01376

and N: 0.100% or less, with the remainder comprising Fe and impurities. The steel sheet surface roughness is such that Rz > 2.5 μm, and the surface is coated with 50 mg/m2-1,500 mg/m2 of oil coated thereon.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1997			JP 976004 A	
HAYASHI KUNIO	2012			WO 2012053636 A1	CAPLUS
KAWASAKI KAORU	2011			WO 2011158818 A1	CAPLUS
KOJIMA TAKESHI	2014			JP 2014159624 A	CAPLUS
KUSUMI KAZUHISA	2008			JP 2008240046 A	CAPLUS
SETO KAZUHIRO	2010			JP 2010174302 A	CAPLUS

IT 2015959-64-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)

RN 2015959-64-3 CAPLUS

CN Iron alloy, base, Fe 83-98,Mn 1.2-4,Si 0.5-3,Cr 0-2,Cu 0-2,Mo 0-2,Ni 0-2,Al 0-1,C 0.1-0.6,B 0-0.1,Nb 0-0.1,P 0-0.1,Ti 0-0.1,V 0-0.1,W 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	83 - 98	7439-89-6
Mn	1.2 - 4	7439-96-5
Si	0.5 - 3	7440-21-3
Cr	0 - 2	7440-47-3
Cu	0 - 2	7440-50-8
Mo	0 - 2	7439-98-7
Ni	0 - 2	7440-02-0
Al	0 - 1	7429-90-5
C	0.1 - 0.6	7440-44-0
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0
Ti	0 - 0.1	7440-32-6
V	0 - 0.1	7440-62-2
W	0 - 0.1	7440-33-7

IPCI B21D0022-20 [I]; B21D0024-00 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-14 [I]; C22C0038-58 [I]; C23F0011-00 [I]; C23G0001-08 [I]

IPCR B21D0022-20 [I]; B21D0024-00 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-14 [I]; C22C0038-58 [I]; C23F0011-00 [I]; C23G0001-08 [I]

CC 55-3 (Ferrous Metals and Alloys)

ST carbon steel sheet manuf hot stamping molded part

IT Adhesion, physical
Annealing
Casting of metals
Cold rolling
Hot rolling
Lubrication
Pickling
Scale (deposits)
Sheet materials
Surface roughness
Tensile strength
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)

IT Metalworking
(stamping, hot; compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)

IT 2015959-64-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 86 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1459241 CAPLUS Full-text
DOCUMENT NUMBER: 165:355921
TITLE: High-strength high-ductility steel sheet for automobile body
INVENTOR(S): Otani, Shigeo; Murakami, Toshio
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.; Chemical Indexing Equivalent to 165:355914 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2016160467	A	20160905	JP 2015-38856	20150227
JP 6348435	B2	20180627		
WO 2016136625	A1	20160901	WO 2016-JP54887	20160219

PRIORITY APPLN. INFO.: JP 2015-38856 A 20150227

AB The steel comprises C: 0.40 - 0.60%, Si+Al: 0.5 - 2.0%, Mn: 1.0 - 4.0%, P: 0 - 0.05%, S: As with 0 - 0.01%, the remainder consists of the iron and the inevitable impurity, steel organization, in the area ratio for all organization, retained austenite 20 - 40%, ferrite with 2 - 20%, the remainder consists of above 1 or 2 kinds of the bainite, the martensite, the tempering bainite, and the tempering martensite, in regard to the carbon concn. in the aforementioned retained austenite, that av. carbon concn. 0.9 - 1.2 mass %, std. deviation of the carbon concn. distribution 0.29 mass % above, that carbon concn. 1.5 mass % the high strength high ductility which in the area ratio the territory above for all organization is 3.0% or more.

IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)
RN 1995867-40-7 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.4-0.6,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.4	-	0.6	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength ductility automobile body
IT Automobile bodies
Elongation at break
Microstructure
Phase composition
Sheet materials
Tensile strength

Yield strength
(high-strength high-ductility steel sheet for automobile body)
IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 87 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1459216 CAPLUS Full-text
DOCUMENT NUMBER: 165:355920
TITLE: High-strength high-ductility steel sheet for automobile body
INVENTOR(S): Otani, Shigeo; Murakami, Toshio
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.; Chemical Indexing Equivalent to 165:355916 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2016160468	A	20160905	JP 2015-38857	20150227
JP 6348436	B2	20180627		
WO 2016136627	A1	20160901	WO 2016-JP54890	20160219

PRIORITY APPLN. INFO.: JP 2015-38857 A 20150227

AB The present invention relates to a high-strength and highly-ductile steel sheet comprises: a compn. contg. C, (Si+Al), Mn, P, and S in specific amts., with the remainder comprising iron and unavoidable impurities; and a structure contg. residual austenite in a specific area ratio, with the remainder comprising at least one of bainite, martensite, tempered bainite, and tempered martensite. The carbon is present in the residual austenite at a specific concn. and concn. distribution, and regions having a carbon concn. of at least 1.5 mass% constitute at least 2.0% of the total structure.

IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)
RN 1995867-40-7 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.4-0.6,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Al	0 - 2	7429-90-5
Si	0 - 2	7440-21-3
B	0 - 1	7440-42-8
Cr	0 - 1	7440-47-3
Cu	0 - 1	7440-50-8
Mo	0 - 1	7439-98-7
Ni	0 - 1	7440-02-0
C	0.4 - 0.6	7440-44-0
Hf	0 - 0.2	7440-58-6
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
Zr	0 - 0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N];
C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]

IPCR C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength ductility automobile body
IT Automobile bodies
Elongation at break
Microstructure
Sheet materials
Tensile strength
(high-strength high-ductility steel sheet for automobile body)
IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)

L12 ANSWER 88 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1441448 CAPLUS Full-text
DOCUMENT NUMBER: 165:355916
TITLE: High-strength high-ductility steel sheet for automobile body
INVENTOR(S): Otani, Shigeo; Murakami, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 28pp.; Chemical Indexing Equivalent to 165:355920 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016136627	A1	20160901	WO 2016-JP54890	20160219
JP 2016160468	A	20160905	JP 2015-38857	20150227
JP 6348436	B2	20180627		

PRIORITY APPLN. INFO.: JP 2015-38857 A 20150227

AB The present invention relates to a high-strength and highly-ductile steel sheet comprises: a compn. contg. C, (Si+Al), Mn, P, and S in specific amts., with the remainder comprising iron and unavoidable impurities; and a structure contg. residual austenite in a specific area ratio, with the remainder comprising at least one of bainite, martensite, tempered bainite, and tempered martensite. The carbon is present in the residual austenite at a specific concn. and concn. distribution, and regions having a carbon concn. of at least 1.5 mass% constitute at least 2.0% of the total structure.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AKAMIZU HIROSHI	2005			JP 2005336526 A	CAPLUS
Anon	1996			JP 83720 A	
HAYASHI KOTARO	2014			JP 2014025091 A	CAPLUS
KINO NOBUO	2001			JP 2001330101 A	CAPLUS
KUROKAWA SHINPEI	2013			JP 2013159802 A	CAPLUS
SHIBAIRI KOSUKE	2013			JP 2013204093 A	CAPLUS
SUZUKI TAKESHI	2010			JP 2010222671 A	CAPLUS
SUZUKI TAKESHI	2013			JP 2013036087 A	CAPLUS

IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)
RN 1995867-40-7 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.4-0.6,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.4	-	0.6	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength ductility automobile body
IT Automobile bodies
Elongation at break
Microstructure
Sheet materials
Tensile strength
(high-strength high-ductility steel sheet for automobile body)
IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)

L12 ANSWER 89 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1441302 CAPLUS Full-text
DOCUMENT NUMBER: 165:355914
TITLE: High-strength high-ductility steel sheet for automobile body
INVENTOR(S): Otani, Shigeo; Murakami, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 27pp.; Chemical Indexing Equivalent to 165:355921 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016136625	A1	20160901	WO 2016-JP54887	20160219
JP 2016160467	A	20160905	JP 2015-38856	20150227
JP 6348435	B2	20180627		

PRIORITY APPLN. INFO.: JP 2015-38856 A 20150227
AB The steel sheet comprising a compn. contg. C, (Si+Al), Mn, P, and S in specific amts., with the remainder comprising iron and unavoidable impurities; and a structure contg. residual austenite and ferrite in a specific area ratio. Carbon is present in the residual austenite at a specific concn. and concn. distribution, and regions having a carbon concn. of at least 1.5 mass% constitute at least 3.0% of the total structure.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
HATAKE HIDEO	2011			JP 2011219859 A	CAPLUS
HATAKE HIDEO	2012			JP 2012240095 A	CAPLUS
KAKIUCHI ELIJAH	2013			JP 2013181184 A	CAPLUS
MURAKAMI TOSHIO	2012			JP 2012122130 A	CAPLUS
SATO KOICHI	2013			WO 2013047808 A1	CAPLUS
WAKITA MASAYUKI	2007			JP 2007023339 A	CAPLUS

YOSHIDA MITSURU |2012 | | |JP 2012251201 A |CAPLUS

IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)

RN 1995867-40-7 CAPLUS

CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.4-0.6,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.4	-	0.6	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strength ductility automobile body
IT Automobile bodies
Elongation at break
Microstructure
Phase composition
Sheet materials
Tensile strength
Yield strength
(high-strength high-ductility steel sheet for automobile body)
IT 1995867-40-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel sheet for automobile body)

L12 ANSWER 90 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1420548 CAPLUS Full-text
DOCUMENT NUMBER: 165:369451
TITLE: Anti-bacterial stainless steel
INVENTOR(S): Zhu, Hongyan
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105908085	A	20160831	CN 2016-10462806	20160622

PRIORITY APPLN. INFO.: CN 2016-10462806 20160622

AB The present invention discloses an anti-bacterial stainless steel, comprising the following chem. compns.: nickel 0.30-0.50wt%, manganese 0.80-1.40wt%, silicon 0.20-0.34wt%, carbon 0.14-0.18wt%, boron 0.02-0.06wt%, phosphorus 0.01-0.02wt%, sulfur 0.015-0.025wt%, erbium 0.08-0.1wt%, vanadium 0.06-0.2wt% , thulium 0.2-0.3wt%, molybdenum 0.02-0.08wt%, titanium 0.08-0.1wt%, niobium 0.02-0.04wt%, rubidium

0.06~0.2wt%, thorium 0.08-0.1wt%, chromium and copper 0.06-0.08wt%, and iron as balance, wherein, the chromium content is 5~7 times of copper content. The anti-bacteria stainless steel provided by the present invention has excellent anti-bacterial property. The anti-bacterial effect of antibacterial stainless steel is relevant with the ratio of chromium and copper content, and when chromium content is 5-7 times of copper content, the antibacterial effect reaches the best.

IT 1998722-49-8, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B 0-0.1, Er 0.1, V 0.1-0.2, Tm 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, Cr 0-0.1, Cu 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(anti-bacterial stainless steel)

RN 1998722-49-8 CAPLUS

CN Iron alloy, base, Fe 96-98,Mn 0.8-1.4,Ni 0.3-0.5,Si 0.2-0.3,Tm 0.2-0.3,C 0.1-0.2,Rb 0.1-0.2,V 0.1-0.2,Er 0.1,Th 0.1,Ti 0.1,B 0-0.1,Cr 0-0.1,Cu 0-0.1,Mo 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Mn	0.8	-	1.4	7439-96-5
Ni	0.3	-	0.5	7440-02-0
Si	0.2	-	0.3	7440-21-3
Tm	0.2	-	0.3	7440-30-4
C	0.1	-	0.2	7440-44-0
Rb	0.1	-	0.2	7440-17-7
V	0.1	-	0.2	7440-62-2
Er	0.1			7440-52-0
Th	0.1			7440-29-1
Ti	0.1			7440-32-6
B	0	-	0.1	7440-42-8
Cr	0	-	0.1	7440-47-3
Cu	0	-	0.1	7440-50-8
Mo	0	-	0.1	7439-98-7

IPCI C22C0038-04; C22C0038-02; C22C0038-08; C22C0038-12; C22C0038-14; C22C0038-18; C22C0038-16

IPCR C22C0038-04 [I]; C22C0038-02 [I]; C22C0038-08 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]

CC 55-12 (Ferrous Metals and Alloys)

ST antibacterial stainless steel

IT Antibacterial agents
Candida albicans
Clostridium tetani
Escherichia coli
Staphylococcus aureus
(anti-bacterial stainless steel)

IT 1998722-49-8, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B 0-0.1, Er 0.1, V 0.1-0.2, Tm 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, Cr 0-0.1, Cu 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(anti-bacterial stainless steel)

L12 ANSWER 91 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2016:1363138 CAPLUS Full-text

DOCUMENT NUMBER: 165:320572

TITLE: Alloy steel with high strength and high toughness

INVENTOR(S): He, Huaqiong

PATENT ASSIGNEE(S): Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105861921	A	20160817	CN 2016-10264079	20160423

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

PRIORITY APPLN. INFO.: CN 2016-10264079 20160423

AB The title alloy steel comprises boron 0.02-0.1 wt%, carbon 0.1-0.2 wt%, chromium 0.1 wt%, cobalt and zirconium (at a ratio of 4-6:1) 0.05-0.1 wt%, copper 0.2-0.3 wt%, manganese 0.8-1.2 wt%, molybdenum 0.04-0.1 wt%, nickel 0.3-0.5 wt%, niobium 0.02-0.04 wt%, phosphorus 0.01-0.03 wt%, rubidium 0.2 wt%, silicon 0.2-0.3 wt%, sulfur 0.015-0.025 wt%, thorium 0.1 wt%, titanium 0.1 wt%, vanadium 0.1 wt%, iron bal. The alloy steel of the present invention has ultra-high strength and toughness, and can be used for producing workpieces with relatively high requirements on strength and toughness. The strength and toughness of the alloy steel are related to the content ratio of cobalt to zirconium in the alloy, and little change of the ratio greatly affects the strength and toughness.

IT 1988674-60-7, Boron 0-0.1, carbon 0.1-0.2, chromium 0.1, cobalt 0-0.1, copper 0.2-0.3, manganese 0.8-1.2, molybdenum 0-0.1, nickel 0.3-0.5, rubidium 0.2, silicon 0.2-0.3, thorium 0.1, titanium 0.1, vanadium 0.1, zirconium 0-0.1, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(alloy steel with high strength and high toughness)

RN 1988674-60-7 CAPLUS

CN Iron alloy, base, Fe 96-98,Mn 0.8-1.2,Ni 0.3-0.5,Cu 0.2-0.3,Si 0.2-0.3,Rb 0.2,C 0.1-0.2,Cr 0.1,Th 0.1,Ti 0.1,V 0.1,B 0-0.1,Co 0-0.1,Mo 0-0.1,Zr 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Mn	0.8	-	1.2	7439-96-5
Ni	0.3	-	0.5	7440-02-0
Cu	0.2	-	0.3	7440-50-8
Si	0.2	-	0.3	7440-21-3
Rb		0.2		7440-17-7
C	0.1	-	0.2	7440-44-0
Cr		0.1		7440-47-3
Th		0.1		7440-29-1
Ti		0.1		7440-32-6
V		0.1		7440-62-2
B	0	-	0.1	7440-42-8
Co	0	-	0.1	7440-48-4
Mo	0	-	0.1	7439-98-7
Zr	0	-	0.1	7440-67-7

IPCI C22C0038-02; C22C0038-32; C22C0038-04; C22C0038-18; C22C0038-12; C22C0038-10; C22C0038-08; C22C0038-16; C22C0038-14

IPCR C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-08 [I]; C22C0038-10 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]; C22C0038-32 [I]

CC 55-1 (Ferrous Metals and Alloys)

ST alloy steel tensile yield strength toughness

IT Impact strength
Tensile strength
Yield strength
(alloy steel with high strength and high toughness)

IT 1988674-60-7, Boron 0-0.1, carbon 0.1-0.2, chromium 0.1, cobalt 0-0.1, copper 0.2-0.3, manganese 0.8-1.2, molybdenum 0-0.1, nickel 0.3-0.5, rubidium 0.2, silicon 0.2-0.3, thorium 0.1, titanium 0.1, vanadium 0.1, zirconium 0-0.1, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(alloy steel with high strength and high toughness)

L12 ANSWER 92 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2016:1336365 CAPLUS Full-text

DOCUMENT NUMBER: 165:309752

TITLE: Abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and manufacturing method thereof

INVENTOR(S): Hou, Dengyi; Feng, Yong; Sun, Genling; Wang, Nanhui; Cong, Liang; Su, Xiumei; Yang, Ruixia

PATENT ASSIGNEE(S): Shandong Iron & Steel Co., Ltd., Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing, 11pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105861928	A	20160817	CN 2016-10440247	20160617

PRIORITY APPLN. INFO.: CN 2016-10440247 20160617

AB The present invention belongs to the tech. field of prodn. of steel plates for engineering machinery and particularly relates to an abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and a manufg. method thereof. The abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery comprises the following molten chem. components in percentage by wt.: C 0.16-0.18%, Si 0.05-0.20%, Mn, 0.50-0.70%, P less than or equal to 0.010%, S less than or equal to 0.003%, Alt 0.020-0.030%, Cr 0.35-0.45%, Mo 0.10-0.15%, B 0.0008-0.0015%, Ti 0.015-0.025%, O less than or equal to 10 ppm, N less than or equal to 15 ppm, H less than or equal to 3 ppm, and the balance of Fe and inevitable impurities. The manuf. method comprises KR iron melt pre-treatment, converter smelting, deoxidn. alloying, CAS refining, LF refining, RH vacuum degassing, electromagnetic stirring and continuously casting to gain blanks, cold stacking the blanks, heating the blanks, high pressure water descaling, four-roll rough rolling, four-roll finish rolling, thermal straightening, water cooling and quenching, thermal straightening, distressing and annealing, thermal straightening, and length-fixing cutting. The steel plate belongs to thin-size high-grade high-strength abrasion-resistant steel, has excellent mech. property, high purity and good plate shape, and is easy to weld.

IT 1315482-08-6P, HB450, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and manufg. method thereof)

RN 1315482-08-6 CAPLUS
CN Steel, (HB450) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	1.2	-	1.6	7439-96-5
Si	0.4	-	0.6	7440-21-3
B	0	-	0.4	7440-42-8
Cr	0	-	0.4	7440-47-3
Ti	0	-	0.4	7440-32-6
C		0.2		7440-44-0

IPCI C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-18; C22C0038-12; C22C0038-32; C22C0038-14; C22C0033-04; C21D0001-30; C21D0001-18; C21D0008-02
IPCR C22C0038-02 [I]; C21D0001-18 [I]; C21D0001-30 [I]; C21D0008-02 [I]; C22C0033-04 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-18 [I]; C22C0038-32 [I]
CC 55-1 (Ferrous Metals and Alloys)
ST steel plate thickness engineering machinery manufg rolling quenching annealing

IT Apparatus
(Engineering; abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and manufg. method thereof)

IT Annealing
Finishing
Industrial manufacturing
Plates
Quenching (cooling)
Rolling (metals)
(abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and manufg. method thereof)

IT 1315482-08-6P, HB450, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(abrasion-resistant steel plate with thickness of 4-8 mm for HB450-grade engineering machinery and manufg. method thereof)

L12 ANSWER 93 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1336280 CAPLUS Full-text
DOCUMENT NUMBER: 165:320587
TITLE: Long-service-life steel ball for shot blasting surface treatment, and its preparation method
INVENTOR(S): Hu, Yinji
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 16pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105861922	A	20160817	CN 2016-10272692	20160428
CN 105861922	B	20170929		
PRIORITY APPLN. INFO.:			CN 2016-10272692	20160428

AB The inventive long-service-life steel ball for shot blasting surface treatment comprises (by wt%) aluminum 0.001-0.05, carbon 0.1-0.4, chromium 0.3-1.5, copper 0.05-0.2, manganese 0.4-1.5, molybdenum 0.001-0.05, nickel 0.001-0.1, niobium 0.001-0.2, phosphorus 0-0.05, silicon 0.1-1.0, sulfur 0-0.05, titanium 0.001-0.1, tungsten 0.001-0.1, vanadium 0.001-0.2, zinc 0.001-0.1, boron, magnesium, cerium and/or lanthanum 0.0001-0.1, iron balance. The steel ball has metallog. structure of lath martensite-bainite duplex structure, or lath martensite-plate martensite duplex structure. The prepn. method includes smelting, deoxidizing with aluminum, performing centrifugal granulation, cooling with water to form as-cast steel balls, drying, sieving, heating at 860-930°C for 30-40 min, quenching in water, and tempering by heating at 150-480°C for 30-60 min. The steel ball has good wear resistance, long service life, high surface hardness, and breaking resistance.
IT 1988677-28-6P, Carbon 0.1-0.4, chromium 0.3-1.5, copper 0.05-0.2, manganese 0.4-1.5, nickel 0.001-0.1, niobium 0.001-0.2, silicon 0.1-1.0, titanium 0.001-0.1, tungsten 0.001-0.1, vanadium 0.001-0.2, zinc 0.001-0.1, boron 0-0.1, magnesium 0-0.1, cerium 0-0.1, lanthanum 0.0001-0.1, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(long-service-life steel ball for shot blasting surface treatment, and its prepn. method)
RN 1988677-28-6 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.4-1.5,Cr 0.3-1.5,Si 0.1-1,C 0.1-0.4,Cu 0-0.2,Nb 0-0.2,V 0-0.2,B 0-0.1,Ce 0-0.1,La 0-0.1,Mg 0-0.1,Ni 0-0.1,Ti 0-0.1,W 0-0.1,Zn 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.4 - 1.5	7439-96-5
Cr	0.3 - 1.5	7440-47-3
Si	0.1 - 1	7440-21-3
C	0.1 - 0.4	7440-44-0
Cu	0 - 0.2	7440-50-8
Nb	0 - 0.2	7440-03-1
V	0 - 0.2	7440-62-2
B	0 - 0.1	7440-42-8
Ce	0 - 0.1	7440-45-1
La	0 - 0.1	7439-91-0
Mg	0 - 0.1	7439-95-4
Ni	0 - 0.1	7440-02-0

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    Ti      0   -   0.1      7440-32-6
    W       0   -   0.1      7440-33-7
    Zn      0   -   0.1      7440-66-6

IPCI C22C0038-02; C22C0038-04; C22C0038-60; C22C0038-18; C22C0038-12;
     C22C0038-14; C22C0038-08; C22C0038-16; C22C0038-06; C22C0038-32;
     C21D0006-00; C21D0009-36; C21D0001-18; B22F0009-10
IPCR C22C0038-02 [I]; B22F0009-10 [I]; C21D0001-18 [I]; C21D0006-00 [I];
     C21D0009-36 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-08 [I];
     C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I];
     C22C0038-32 [I]; C22C0038-60 [I]
CC   55-3 (Ferrous Metals and Alloys)
ST   steel ball shot blasting surface treatment long service life
IT   Deoxidation
     Granulation
     Quenching (cooling)
     Shotblasting
     Sieving
     Smelting
     Spheres
     Tempering
     Wear-resistant materials
        (long-service-life steel ball for shot blasting surface
        treatment, and its prepn. method)
IT   1988677-28-6P, Carbon 0.1-0.4, chromium 0.3-1.5, copper
     0.05-0.2, manganese 0.4-1.5, nickel 0.001-0.1, niobium 0.001-0.2, silicon
     0.1-1.0, titanium 0.001-0.1, tungsten 0.001-0.1, vanadium 0.001-0.2, zinc
     0.001-0.1, boron 0-0.1, magnesium 0-0.1, cerium 0-0.1, lanthanum
     0.0001-0.1, iron bal.
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); TEM (Technical or engineered material use); PREP (Preparation);
     PROC (Process); USES (Uses)
        (long-service-life steel ball for shot blasting surface
        treatment, and its prepn. method)
IT   7429-90-5, Aluminum, processes
     RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical
     process); PROC (Process); USES (Uses)
        (long-service-life steel ball for shot blasting surface
        treatment, and its prepn. method)


L12  ANSWER 94 OF 398  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2016:1287935  CAPLUS Full-text
DOCUMENT NUMBER:         165:278246
TITLE:                   Steel sheet blank having laser cut end surfaces,
                         steel sheet for laser cutting, and manufacture thereof
INVENTOR(S):             Fujinaka, Shingo
PATENT ASSIGNEE(S):      Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 17pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:
     PATENT NO.          KIND  DATE        APPLICATION NO.         DATE
     ---------------     ----  --------    ---------------------   --------
     JP 2016141816        A    20160808    JP 2015-15695           20150129
     JP 6417977           B2   20181107
PRIORITY APPLN. INFO.:                    JP 2015-15695           20150129
AB   The title steel sheet blank is characterized by a compn. contg. C
     0.02-0.16, Si 0.04-2, Mn 0.4-3, P ≤0.05, S ≤0.02, sol.Al
     0.01-2, and balance Fe, a microstructure having martensite and bainite for
     total area ratio ≥70% at cut end surfaces with 40 μm width to
     inside, and having ferrite area ratio 10-90%, retained austenite area
     ratio ≥1%, and balance martensite and bainite at mother material
     parts except the cut end surfaces, and tensile strength ≥440 MPa
     and <780 MPa.  Optionally, the compn. contains (1) Ti ≤0.2, Nb
     ≤0.2, and/or V ≤0.2, (2) Cu ≤1, Ni ≤1, Cr
     ≤1, Mo ≤1, and/or B ≤0.1, and/or (3) REM ≤0.1,
     Mg ≤0.01, Ca ≤0.01, and/or Bi ≤0.1 mass%.  The title
     steel sheet is manufd. by the steps comprising: hot rolling a steel
     slab at 1100-1300°, finishing the hot rolling at 850-950°,
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and then coiling at ≤650°; (B) pickling and cold rolling the hot rolled sheet; and then (C) continuous annealing by heating at ≥[(Ac1 + Ac3)/2] and ≤(Ac3 + 50°), retaining at the temp. region for 240 s, and then cooling at av. cooling rate 2-50°/s to 250-500°. The manuf. process provides the high-strength steel sheet having excellent elongation and stretch flangeability to give the steel sheet blank.

IT 1980840-39-8D, Mg,Ca microalloy
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

RN 1980840-39-8 CAPLUS

CN Iron alloy, base, Fe 88-100,Mn 0.4-3,Al 0-2,Si 0-2,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,B 0-0.1,Bi 0-0.1,misch metal 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	88 - 100	7439-89-6
Mn	0.4 - 3	7439-96-5
Al	0 - 2	7429-90-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
Cu	0 - 1	7440-50-8
Mo	0 - 1	7439-98-7
Ni	0 - 1	7440-02-0
C	0 - 0.2	7440-44-0
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
B	0 - 0.1	7440-42-8
Bi	0 - 0.1	7440-69-9
Misch metal	0 - 0.1	8049-20-5

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]

IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]

CC 55-5 (Ferrous Metals and Alloys)

ST laser cutting steel sheet blank microstructure; annealing steel sheet laser cutting

IT Annealing
Hot rolling
Laser cutting
Microstructure
(manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

IT 1980840-37-6 1980840-39-8D, Mg,Ca microalloy
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

IT 12173-93-2, Martensite, uses 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component)
RL: TEM (Technical or engineered material use); USES (Uses)
(manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

IT 7439-95-4D, Magnesium, trace in steel 7440-70-2D, Calcium, trace in steel
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microalloy; manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

IT 12244-31-4, Austenite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(retained; manuf. of steel sheet for laser cutting and microstructure of steel sheet blank)

L12 ANSWER 95 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1097932 CAPLUS Full-text

DOCUMENT NUMBER: 165:167420
TITLE: An alloy steel new material with resistance to high temperature oxidation
INVENTOR(S): Guo, Jiachuan
PATENT ASSIGNEE(S): Wenling Chuangjia Information Technology Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105734420	A	20160706	CN 2016-10154150	20160317

PRIORITY APPLN. INFO.: CN 2016-10154150 20160317

AB The present invention discloses an alloy steel new material with resistance to high temp. oxidn., comprising 0.30~0.50wt% of nickel, 0.80%~1.40wt% of manganese, 0.20~0.34wt% of silicon, 0.14~0.18wt% of carbon, 0.02~0.06wt% of boron, 0.01~0.02wt% of phosphorus, 0.015~0.025wt% of sulfur, 0.08~0.1wt% of chromium, 0.06~0.2wt% of vanadium, 0.2~0.3wt% of copper, 0.02~0.08wt% of molybdenum, 0.08~0.1wt% of titanium, 0.02~0.04wt% of niobium, 0.06~0.2wt% of rubidium, 0.08~0.1wt% of thorium, 0.06~0.1wt% of lanthanum and germanium, and balance iron; wherein the germanium content is 2~4 times of the lanthanum content. The alloy steel new material provided by the present invention has excellent high temp. oxidn. resistance, and could be used for manufg. the workpiece with high temp. oxidn. resistance. The high temp. oxidn. resistance of the alloy steel new material is related with the content proportion of the lanthanum and germanium in the alloy steel.

IT 1960401-15-3, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B 0-0.1, Cr 0.1, V 0.1-0.2, Cu 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, La 0-0.1, Ge 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(alloy steel new material with resistance to high temp. oxidn.)

RN 1960401-15-3 CAPLUS
CN Iron alloy, base, Fe 96-98,Mn 0.8-1.4,Ni 0.3-0.5,Cu 0.2-0.3,Si 0.2-0.3,C 0.1-0.2,Rb 0.1-0.2,V 0.1-0.2,Cr 0.1,Th 0.1,Ti 0.1,B 0-0.1,Ge 0-0.1,La 0-0.1,Mo 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	96 - 98	7439-89-6
Mn	0.8 - 1.4	7439-96-5
Ni	0.3 - 0.5	7440-02-0
Cu	0.2 - 0.3	7440-50-8
Si	0.2 - 0.3	7440-21-3
C	0.1 - 0.2	7440-44-0
Rb	0.1 - 0.2	7440-17-7
V	0.1 - 0.2	7440-62-2
Cr	0.1	7440-47-3
Th	0.1	7440-29-1
Ti	0.1	7440-32-6
B	0 - 0.1	7440-42-8
Ge	0 - 0.1	7440-56-4
La	0 - 0.1	7439-91-0
Mo	0 - 0.1	7439-98-7

IPCI C22C0038-04; C22C0038-08; C22C0038-02; C22C0038-18; C22C0038-12; C22C0038-16; C22C0038-14
IPCR C22C0038-04 [I]; C22C0038-02 [I]; C22C0038-08 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]
CC 55-12 (Ferrous Metals and Alloys)
ST alloy steel material high temp oxidn resistance
IT Furnaces
(alloy steel new material with resistance to high temp. oxidn.)
IT 1960401-15-3, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B

0-0.1, Cr 0.1, V 0.1-0.2, Cu 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, La 0-0.1, Ge 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(alloy steel new material with resistance to high temp. oxidn.)

L12 ANSWER 96 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1011326 CAPLUS Full-text
DOCUMENT NUMBER: 165:117791
TITLE: High temperature resistant alloy steel and preparation method thereof
INVENTOR(S): Xu, Ting
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105695866	A	20160622	CN 2016-10264926	20160423

PRIORITY APPLN. INFO.: CN 2016-10264926 20160423

AB The present invention discloses a high temp. resistant alloy steel and prepn. method thereof, comprising 0.30-0.50wt% of nickel, 0.80%-1.40wt% of manganese, 0.20-0.34wt% of silicon, 0.14-0.18wt% of carbon, 0.02-0.06wt% of boron, 0.01-0.02wt% of phosphorus, 0.015-0.025wt% of sulfur, 0.08-0.1wt% of chromium, 0.06-0.2wt% of vanadium, 0.2-0.3wt% of copper, 0.02-0.08wt% of molybdenum, 0.08-0.1wt% of titanium, 0.02-0.04wt% of niobium, 0.06-0.2wt% of rubidium, 0.08-0.1wt% of thorium, 0.06-0.1wt% of erbium and thulium, the residue is iron; wherein, the content of described thulium is 2-4 times of the content of erbium. The alloy steel novel material provided by the present invention has excellent high temp. oxidn. resistance, it is possible to prep. the workpiece that the high temp. oxidn. resistance is high. The high temp. oxidn. resistance of this alloy steel novel material is relevant with the content ratio of thulium and erbium in this steel alloy.

IT 1949764-15-1, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B 0-0.1, Cr 0.1, V 0.1-0.2, Cu 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, Er 0-0.1, Tm 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(high temp. resistant alloy steel and prepn. method thereof)
RN 1949764-15-1 CAPLUS
CN Iron alloy, base, Fe 96-98,Mn 0.8-1.4,Ni 0.3-0.5,Cu 0.2-0.3,Si 0.2-0.3,C 0.1-0.2,Rb 0.1-0.2,V 0.1-0.2,Cr 0.1,Th 0.1,Ti 0.1,B 0-0.1,Er 0-0.1,Mo 0-0.1,Tm 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Mn	0.8	-	1.4	7439-96-5
Ni	0.3	-	0.5	7440-02-0
Cu	0.2	-	0.3	7440-50-8
Si	0.2	-	0.3	7440-21-3
C	0.1	-	0.2	7440-44-0
Rb	0.1	-	0.2	7440-17-7
V	0.1	-	0.2	7440-62-2
Cr		0.1		7440-47-3
Th		0.1		7440-29-1
Ti		0.1		7440-32-6
B	0	-	0.1	7440-42-8
Er	0	-	0.1	7440-52-0
Mo	0	-	0.1	7439-98-7
Tm	0	-	0.1	7440-30-4

IPCI C22C0038-08; C22C0038-04; C22C0038-02; C22C0038-32; C22C0038-18; C22C0038-12; C22C0038-16; C22C0038-14
IPCR C22C0038-08 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]; C22C0038-32 [I]
CC 55-12 (Ferrous Metals and Alloys)

ST high temp resistant alloy steel
IT Heat-resistant materials
(high temp. resistant alloy steel and prepn. method thereof)
IT 1949764-15-1, Ni 0.3-0.5, Mn 0.8-1.4, Si 0.2-0.3, C 0.1-0.2, B 0-0.1, Cr 0.1, V 0.1-0.2, Cu 0.2-0.3, Mo 0-0.1, Ti 0.1, Rb 0.1-0.2, Th 0.1, Er 0-0.1, Tm 0-0.1, Fe bal.
RL: TEM (Technical or engineered material use); USES (Uses)
(high temp. resistant alloy steel and prepn. method thereof)

L12 ANSWER 97 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:894459 CAPLUS Full-text
DOCUMENT NUMBER: 165:46380
TITLE: A high-strength high-toughness alloy steel
INVENTOR(S): Song, Xiaoling
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 5pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105624555	A	20160601	CN 2016-10038427	20160120

PRIORITY APPLN. INFO.: CN 2016-10038427 20160120

AB The present invention discloses a high-strength high-toughness alloy steel. The alloy steel includes carbon 0.14-0.18, Si 0.20-0.34, boron 0.02-0.06, Mn 0.80-1.40, phosphorus 0.01-0.02, sulfur 0.015-0.025, chromium 0.08-0.1, vanadium 0.06-0.2, nickel 0.30-0.50, Cu 0.2-0.3, molybdenum 0.02-0.08, titanium 0.08-0.1, niobium 0.02-0.04, rubidium 0.06-0.2, indium 0.01-0.02, europium 0.02-0.08, thorium 0.08-0.1, the balance iron; wherein the content of europium is 2 to 4 times of indium content. Alloy steel of the present invention has ultra-high strength and toughness, can be used in manuf. of workpiece with high requirement to strength and toughness. The strength and toughness of the steel alloy is relative to content ratio of europium and indium in alloy steel, and small changes of the content ratio has large influence on the strength and toughness.

IT 1935673-46-3, Boron 0.02-0.06, carbon 0.14-0.18, copper 0.2-0.3, chromium 0.1, europium 0.02-0.08, iron 71.28-97.88, manganese 0.80-1.40, molybdenum 0.02-0.08, nickel 0.30-0.50, rubidium 0.06-0.2, silicon 0.20-0.34, titanium 0.1, thorium 0.1, vanadium 0.06-0.2
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength high-toughness alloy steel)
RN 1935673-46-3 CAPLUS
CN Iron alloy, base, Fe 71-98,Mn 0.8-1.4,Ni 0.3-0.5,Cu 0.2-0.3,Si 0.2-0.3,C 0.1-0.2,Rb 0.1-0.2,V 0.1-0.2,Cr 0.1,Th 0.1,Ti 0.1,B 0-0.1,Eu 0-0.1,Mo 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	71 - 98	7439-89-6
Mn	0.8 - 1.4	7439-96-5
Ni	0.3 - 0.5	7440-02-0
Cu	0.2 - 0.3	7440-50-8
Si	0.2 - 0.3	7440-21-3
C	0.1 - 0.2	7440-44-0
Rb	0.1 - 0.2	7440-17-7
V	0.1 - 0.2	7440-62-2
Cr	0.1	7440-47-3
Th	0.1	7440-29-1
Ti	0.1	7440-32-6
B	0 - 0.1	7440-42-8
Eu	0 - 0.1	7440-53-1
Mo	0 - 0.1	7439-98-7

IPCI C22C0038-04; C22C0038-02; C22C0038-18; C22C0038-12; C22C0038-08; C22C0038-16; C22C0038-14
IPCR C22C0038-04 [I]; C22C0038-02 [I]; C22C0038-08 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]

CC 55-12 (Ferrous Metals and Alloys)
ST high strength toughness alloy steel
IT 1935673-46-3, Boron 0.02-0.06, carbon 0.14-0.18, copper 0.2-0.3, chromium 0.1, europium 0.02-0.08, iron 71.28-97.88, manganese 0.80-1.40, molybdenum 0.02-0.08, nickel 0.30-0.50, rubidium 0.06-0.2, silicon 0.20-0.34, titanium 0.1, thorium 0.1, vanadium 0.06-0.2
RL: TEM (Technical or engineered material use); USES (Uses)
(high-strength high-toughness alloy steel)

L12 ANSWER 98 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:892009 CAPLUS Full-text
DOCUMENT NUMBER: 165:46330
TITLE: High-strength high-ductility steel plate for automobile body
INVENTOR(S): Murakami, Toshio; Otani, Shigeo
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 27pp.; Chemical Indexing Equivalent to 165:46317 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016084847	A1	20160602	WO 2015-JP83078	20151125
JP 2016098427	A	20160530	JP 2014-238710	20141126
JP 6282577	B2	20180221		
KR 2017070230	A	20170621	KR 2017-7013590	20151125
KR 2111921	B1	20200518		
CN 107002192	A	20170801	CN 2015-80061877	20151125
CN 107002192	B	20190308		
EP 3225708	A1	20171004	EP 2015-862199	20151125
US 20170268077	A1	20170921	US 2017-15528675	20170522

PRIORITY APPLN. INFO.: JP 2014-238710 A 20141126
WO 2015-JP83078 W 20151125
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention provides a high-strength high-ductility steel plate excellent in strength-ductility balance which can secure tensile strength (TS) × elongation (EL) × elongation flange ability (λ) of more than 1000000MPa·%·%, and yield ratio (YR) of 0.7 or more. The high-strength high-ductility steel plate contains (by wt.%) C 0.10-0.35, Si+Al 0.5-2.0, Mn 1.0-4.0, P 0-0.05, S 0-0.01, and iron and inevitable impurities as balance. As for steel texture, retained austenite is 8% or more at the area rate with respect to all the texture, and the remainder consists of one or two of bainite, martensite, tempered bainite, and tempered martensite. As for the carbon concn. in the retained austenite, the mean carbon concn. is 0.9-1.2 mass%, and the std. deviation of the carbon concn. distribution is more than 0.35 mass%. The region with carbon concn. of more than 1.5 mass% is 1.0% or more at the area rate to all the texture.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AKAMIZU HIROSHI	2005			JP 2005336526 A	CAPLUS
FUTAMURA YUICHI	2011			JP 2011157583 A	CAPLUS
MATSUDA HIROSHI	2010			JP 2010065273 A	CAPLUS
NOMURA MASAHIRO	2005			JP 2005179703 A	CAPLUS
OKAMOTO RIKI	2011			WO 2011093490 A1	CAPLUS
SPEER JOHN G	2006			US 20060011274 A1	CAPLUS

IT 1935673-79-2
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel plate for automobile body)
RN 1935673-79-2 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.1-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.1	-	0.4	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel plate strength ductility microstructure automobile body
IT Automobile bodies
Elongation, mechanical
Phase composition
Tensile strength
Yield strength
(high-strength high-ductility steel plate)
IT Microstructure
(high-strength high-ductility steel plate for automobile body)
IT 7440-44-0, Carbon, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(alloy element, high-strength high-ductility steel plate)
IT 1935673-79-2
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel plate for automobile body)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 99 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:871152 CAPLUS Full-text
DOCUMENT NUMBER: 165:46317
TITLE: High-strength high-ductility steel plate for automobile body
INVENTOR(S): Murakami, Toshio; Otani, Shigeo
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.; Chemical Indexing Equivalent to 165:46330 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 2016098427	A	20160530	JP 2014-238710		20141126
JP 6282577	B2	20180221			
WO 2016084847	A1	20160602	WO 2015-JP83078		20151125
KR 2017070230	A	20170621	KR 2017-7013590		20151125
KR 2111921	B1	20200518			
CN 107002192	A	20170801	CN 2015-80061877		20151125
CN 107002192	B	20190308			
EP 3225708	A1	20171004	EP 2015-862199		20151125
US 20170268077	A1	20170921	US 2017-15528675		20170522
PRIORITY APPLN. INFO.:			JP 2014-238710	A	20141126
			WO 2015-JP83078	W	20151125

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention provides a high-strength high-ductility steel plate excellent in strength-ductility balance which can secure tensile strength (TS) × elongation (EL) × elongation flange ability (λ) of more than 1000000MPa·%·%, and yield ratio (YR) of 0.7 or more. The high-strength high-ductility steel plate contains (by wt.%) C 0.10-0.35, Si+Al 0.5-2.0, Mn 1.0-4.0, P 0-0.05, S 0-0.01, and iron and inevitable impurities as balance. As for steel texture, retained austenite is 8% or more at the area rate with respect to all the texture, and the remainder consists of one or two of bainite, martensite, tempered bainite, and tempered martensite. As for the carbon concn. in the retained austenite, the mean carbon concn. is 0.9-1.2 mass%, and the std. deviation of the carbon concn. distribution is more than 0.35 mass%. The region with carbon concn. of more than 1.5 mass% is 1.0% or more at the area rate to all the texture.

IT 1935673-79-2
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel plate for automobile body)

RN 1935673-79-2 CAPLUS

CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.1-0.4,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Al	0 - 2	7429-90-5
Si	0 - 2	7440-21-3
B	0 - 1	7440-42-8
Cr	0 - 1	7440-47-3
Cu	0 - 1	7440-50-8
Mo	0 - 1	7439-98-7
Ni	0 - 1	7440-02-0
C	0.1 - 0.4	7440-44-0
Hf	0 - 0.2	7440-58-6
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
V	0 - 0.2	7440-62-2
Zr	0 - 0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]

IPCR C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]

CC 55-3 (Ferrous Metals and Alloys)

ST steel plate strength ductility microstructure automobile body

IT Automobile bodies
Elongation, mechanical
Phase composition
Tensile strength
Yield strength
(high-strength high-ductility steel plate)

IT Microstructure
(high-strength high-ductility steel plate for automobile body)

IT 7440-44-0, Carbon, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(alloy element, high-strength high-ductility steel plate)

IT 1935673-79-2
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high-strength high-ductility steel plate for automobile body)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L12 ANSWER 100 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2016:871099 CAPLUS Full-text

DOCUMENT NUMBER: 165:35141
TITLE: High strength high ductility steel plate for automobile body
INVENTOR(S): Murakami, Toshio; Otani, Shigeo
PATENT ASSIGNEE(S): Kobe Steel, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.; Chemical Indexing Equivalent to 165:35129 (WO)
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2016098413	A	20160530	JP 2014-236928	20141121
JP 6282576	B2	20180221		
WO 2016080534	A1	20160526	WO 2015-JP82758	20151120
KR 2017070168	A	20170621	KR 2017-7013013	20151120
KR 2111923	B1	20200518		
CN 107109557	A	20170829	CN 2015-80061931	20151120
EP 3222741	A1	20170927	EP 2015-860677	20151120
US 20170335423	A1	20171123	US 2017-15527814	20170518

PRIORITY APPLN. INFO.: JP 2014-236928 A 20141121
WO 2015-JP82758 W 20151120
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB To provide a superior high strength and high ductility steel sheet strength over ductility balance, a tensile strength (TS) is above 980MPa, tensile strength (TS) × elongation (EL) can be kept more than 25000MPa·%. High strength and high ductility steel sheet component compn., in mass%, C: 0.10-0.30%, Si + Al: 0.5-2.0%, Mn: 1.0-4.0%, P: 0-0.05%, S: at 0-0.01 %, balance of iron and unavoidable impurities, steel organizations has the area ratio for the entire organization, residual austenite is 8% or more, ferrite is less than or equal to 5% greater than 50%, balance bainite, martensite, tempered bainite, and together consist of one or more tempered martensite it relates carbon concn. of the residual austenite, the av. carbon concn. is 0.8-1.1% by mass, the std. deviation of the carbon concn. distribution is 0.25 mass% or more, the carbon concn. for the entire organization is 1.3 mass% or more of the area, it is 1.0% or more in the area ratio.
IT 1933489-48-5
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high strength high ductility steel plate for automobile body)
RN 1933489-48-5 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.1-0.3,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.1	-	0.3	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C21D0001-19 [N]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]

CC 55-3 (Ferrous Metals and Alloys)
ST steel plate strength ductility microstructure automobile body
IT Automobile bodies
Elongation at break
Microstructure
Tensile strength
Yield strength
(high strength high ductility steel plate for automobile body)
IT 7440-44-0, Carbon, properties
RL: PRP (Properties)
(concn. distribution in steel; high strength high ductility steel plate for automobile body)
IT 1933489-48-5
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high strength high ductility steel plate for automobile body)
IT 12173-93-2, Martensite, processes 12244-31-4, Austenite, processes 12427-23-5, Bainite
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(phase; high strength high ductility steel plate for automobile body)

L12 ANSWER 101 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:848429 CAPLUS Full-text
DOCUMENT NUMBER: 165:35129
TITLE: High strength high ductility steel plate for automobile body
INVENTOR(S): Murakami, Toshio; Otani, Shigeo
PATENT ASSIGNEE(S): Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Japan
SOURCE: PCT Int. Appl., 27pp.; Chemical Indexing Equivalent to 165:35141 (JP)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016080534	A1	20160526	WO 2015-JP82758	20151120
JP 2016098413	A	20160530	JP 2014-236928	20141121
JP 6282576	B2	20180221		
KR 2017070168	A	20170621	KR 2017-7013013	20151120
KR 2111923	B1	20200518		
CN 107109557	A	20170829	CN 2015-80061931	20151120
EP 3222741	A1	20170927	EP 2015-860677	20151120
US 20170335423	A1	20171123	US 2017-15527814	20170518

PRIORITY APPLN. INFO.: JP 2014-236928 A 20141121
WO 2015-JP82758 W 20151120
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB In the present invention, a steel plate contains specific alloy components, has a steel structure that contains specific proportions of retained austenite and ferrite, with the remainder comprising one or more types selected from among bainite, martensite, tempered bainite and tempered martensite, and has a specific av. carbon concn. and carbon concn. distribution in the retained austenite. The steel plate is composed of a mass percentage of carbon 0.10 to 0.30, silicon and aluminum 0.5 to 2.0, manganese 1.0-4.0, phosphorus 0.0 to 0.5, sulfur 0.0 to 0.1, and the balance iron and unavoidable impurities.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ENNIS BERNARD LEO	2014			WO 2014139625 A1	CAPLUS
KOBE STEEL LTD	2012			JP 2012180570 A	CAPLUS
KOBE STEEL LTD	2012			JP 2012214869 A	CAPLUS
NIPPON STEEL CORP	2012			JP 2012041573 A	CAPLUS
NIPPON STEEL & SUMITOMO	2013			JP 2013032581 A	CAPLUS

OKAMOTO TSUTOMU |2011 | | |JP 2011195956 A |CAPLUS
IT 1933489-48-5
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high strength high ductility steel plate for automobile body)
RN 1933489-48-5 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-4,Al 0-2,Si 0-2,B 0-1,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,C 0.1-0.3,Hf 0-0.2,Nb 0-0.2,Ti 0-0.2,V 0-0.2,Zr 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	92	-	98	7439-89-6
Mn	1	-	4	7439-96-5
Al	0	-	2	7429-90-5
Si	0	-	2	7440-21-3
B	0	-	1	7440-42-8
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
C	0.1	-	0.3	7440-44-0
Hf	0	-	0.2	7440-58-6
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Zr	0	-	0.2	7440-67-7

IPCI C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C22C0038-58 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel plate strength ductility microstructure automobile body
IT Automobile bodies
Elongation at break
Microstructure
Tensile strength
Yield strength
(high strength high ductility steel plate for automobile body)
IT 7440-44-0, Carbon, properties
RL: PRP (Properties)
(concn. distribution in steel; high strength high ductility steel plate for automobile body)
IT 1933489-48-5
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high strength high ductility steel plate for automobile body)
IT 12173-93-2, Martensite, processes 12244-31-4, Austenite, processes
12427-23-5, Bainite
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(phase; high strength high ductility steel plate for automobile body)

L12 ANSWER 102 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:387717 CAPLUS Full-text
DOCUMENT NUMBER: 164:385854
TITLE: Manufacture method of high-strength high-toughness alloy steel
INVENTOR(S): Tao, Jun; Dong, Banglin; Sheng, Xiang
PATENT ASSIGNEE(S): Anhui Chujiang Special Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 8pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 105385939	A	20160309	CN 2015-10928577	20151215

PRIORITY APPLN. INFO.: CN 2015-10928577 20151215

AB The chem. compn. of the alloy steel contains carbon 0.3-0.58, silicon 0.25-1.38, manganese 0.55-1.55, phosphorus ≤0.025%, sulfur 0.02-0.025, chromium 0.09-1.32, nickel 0.28-0.62, molybdenum 0.02-0.035, titanium 0.18-0.20, vanadium 0.2-0.5, tungsten 0.4-0.9, niobium 0.3-0.6, cobalt 0.11-0.15, copper 0.2-0.8, aluminum ≤0.2, boron ≤0.15%, nitrogen ≤0.3% and inevitable impurities bal. The manuf. method comprises the steps of (1) smelting raw materials in smelting furnace to obtain alloy steel billet, (2) annealing the alloy steel billet, then forging to obtain alloy steel crude product, (3) carrying out heat treatment on the alloy steel crude product, then carrying out primary hot-rolling and fine hot-rolling operations in sequence to obtain alloy steel finished product, and (4) carrying out annealing heat treatment on the alloy steel finished product, cooling to room temp., inspecting and packaging. The alloy steel has low cost, high tensile strength, yield strength and hardness, good uniformity of structure and uniformity of mech. properties, and broad application prospects.

IT 1884454-35-6P, Aluminum 0-0.2, boron 0-0.2, carbon 0.3-0.6, chromium 0.1-1.32, cobalt 0.1-0.2, copper 0.2-0.8, manganese 0.55-1.55, nickel 0.28-0.62, niobium 0.3-0.6, nitrogen 0-0.3, silicon 0.25-1.38, titanium 0.2, tungsten 0.4-0.9, vanadium 0.2-0.5, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(manuf. method of alloy steel having high strength and toughness)

RN 1884454-35-6 CAPLUS

CN Iron alloy, base, Fe 91-97,Mn 0.6-1.6,Si 0.2-1.4,Cr 0.1-1.3,W 0.4-0.9,Cu 0.2-0.8,C 0.3-0.6,Nb 0.3-0.6,Ni 0.3-0.6,V 0.2-0.5,N 0-0.3,Ti 0.2,Co 0.1-0.2,Al 0-0.2,B 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	91 - 97	7439-89-6
Mn	0.6 - 1.6	7439-96-5
Si	0.2 - 1.4	7440-21-3
Cr	0.1 - 1.3	7440-47-3
W	0.4 - 0.9	7440-33-7
Cu	0.2 - 0.8	7440-50-8
C	0.3 - 0.6	7440-44-0
Nb	0.3 - 0.6	7440-03-1
Ni	0.3 - 0.6	7440-02-0
V	0.2 - 0.5	7440-62-2
N	0 - 0.3	17778-88-0
Ti	0.2	7440-32-6
Co	0.1 - 0.2	7440-48-4
Al	0 - 0.2	7429-90-5
B	0 - 0.2	7440-42-8

IPCI C22C0038-02; C22C0038-04; C22C0038-12; C22C0038-14; C22C0038-16; C22C0038-18; C22C0038-08; C22C0033-04; C21D0008-02; C21D0001-26

IPCR C22C0038-02 [I]; C21D0001-26 [I]; C21D0008-02 [I]; C22C0033-04 [I]; C22C0038-04 [I]; C22C0038-08 [I]; C22C0038-12 [I]; C22C0038-14 [I]; C22C0038-16 [I]; C22C0038-18 [I]

CC 55-1 (Ferrous Metals and Alloys)

ST alloy steel smelting forging rolling heat treatment strength toughness

IT Annealing
Forging
Hot rolling
Industrial manufacturing
Smelting
(manuf. method of alloy steel having high strength and toughness)

IT 1884454-35-6P, Aluminum 0-0.2, boron 0-0.2, carbon 0.3-0.6, chromium 0.1-1.32, cobalt 0.1-0.2, copper 0.2-0.8, manganese 0.55-1.55, nickel 0.28-0.62, niobium 0.3-0.6, nitrogen 0-0.3, silicon 0.25-1.38, titanium 0.2, tungsten 0.4-0.9, vanadium 0.2-0.5, iron bal.

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(manuf. method of alloy steel having high strength and toughness)

L12 ANSWER 103 OF 398 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2015:1942164 CAPLUS Full-text
DOCUMENT NUMBER: 164:40753
TITLE: Steel sheet provided with a sacrificial cathodically protected coating comprising lanthanum
INVENTOR(S): Allely, Christian; Petitjean, Jacques
PATENT ASSIGNEE(S): ArcelorMittal Investigacion y Desarrollo, S.L., Spain
SOURCE: PCT Int. Appl., 20pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2015181581	A1	20151203	WO 2014-IB61788	20140528
CA 2950476	A1	20151203	CA 2015-2950476	20150528
WO 2015181318	A1	20151203	WO 2015-EP61891	20150528
KR 2017010773	A	20170201	KR 2016-7032934	20150528
CN 106460138	A	20170222	CN 2015-80027730	20150528
EP 3149217	A1	20170405	EP 2015-724718	20150528
EP 3149217	B1	20180711		
JP 2017524806	T	20170831	JP 2016-569819	20150528
JP 6762879	B2	20200930		
ES 2689039	T3	20181108	ES 2015-724718	20150528
RU 2689979	C2	20190530	RU 2016-146657	20150528
ZA 2016007435	A	20171220	ZA 2016-7435	20161027
IN 201617039713	A	20170310	IN 2016-17039713	20161121
IN 343260	B	20200804		
MX 2016015550	A	20170425	MX 2016-15550	20161125
US 20170198374	A1	20170713	US 2016-15314457	20161128
US 10676804	B2	20200609		

PRIORITY APPLN. INFO.: WO 2014-IB61788 A 20140528
WO 2015-EP61891 W 20150528
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to a steel sheet provided with a sacrificial cathodically protected coating comprising between 1 and 40 % by wt. zinc, between 0.01 and 0.4 % by wt. lanthanum, and optionally up to 10 % by wt. magnesium, optionally up to 15 % by wt. silicon, and optionally up to 0.3 % by wt., in cumulative amts., of addnl. components, the remainder consisting of aluminum and unavoidable impurities or residual elements. The invention also relates to a method of producing parts by hot or cold swaging and the parts which can be obtained in this way.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
LIXIN FENG	2010			CN 101736217 A	CAPLUS
MORIMOTO YASUHIDE	2009			JP 2009120942 A	CAPLUS
NOSE KOICHI	2008			EP 1997927 A1	CAPLUS
ZHAO YUNJIE	2013			CN 103045980 A	CAPLUS

IT 1173986-65-6
RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
RN 1173986-65-6 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3

C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C22C0021-10 [I]
IPCR C23C0002-12 [I]; C22C0021-10 [I]
CC 56-3 (Nonferrous Metals and Alloys)
ST steel sheet sacrificial cathodically protected coating lanthanum swaging
IT Anticorrosive coating materials
Coating process
Swaging
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 7439-91-0, Lanthanum, uses
RL: MOA (Modifier or additive use); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 12597-69-2, Steel, uses 1173986-65-6
RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 1832643-11-4
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)

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L13 ANSWER 1 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2713368 CAPLUS Full-text
DOCUMENT NUMBER: 174:278826
TITLE: Steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance
INVENTOR(S): Nakano, Katsuya; Takeda, Kengo; Kawata, Hiroyuki; Uenishi, Akihiro; Suzuki, Yuya
PATENT ASSIGNEE(S): Nippon Steel Corporation, Japan
SOURCE: PCT Int. Appl., 58pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2020262651	A1	20201230	WO 2020-JP25352		20200626
PRIORITY APPLN. INFO.:			JP 2019-121092	A	20190628
			JP 2019-121093	A	20190628

AB A steel sheet which has a metal structure that contains, in terms of vol. fraction, 95% or more of tempered martensite and a total of 5% or less of one or more structures selected from among ferrite, pearlite, bainite, as-quenched martensite and residual austenite. This steel sheet has a tensile strength of 1,100 MPa or more; the std. deviation of the Vickers hardness is 30 or less as measured under a load of 9.8 N at 30 points in a 300μm square area that is centered at the position of t/2, where t is the sheet thickness, in a cross-section of the steel sheet 10, said cross-section being parallel to the sheet thickness direction; and if nanohardness is measured under a max. load of 1 mN at 100 points in a 100μm square area that is centered at the position of t/2, the ratio of the measurement points that have a nanohardness difference of 3 GPa or more from 8 adjacent measurement points is 10% or less.
IT 2572991-88-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES

(Uses)
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
RN 2572991-88-7 CAPLUS
CN Iron alloy, base, Fe 85-99,Mn 0.6-5,Si 0-2.5,Cr 0-2,Al 0-1,Co 0-1,Ni 0-1,Cu 0-0.5,Mo 0-0.5,V 0-0.5,C 0.2-0.4,B 0-0.1,Nb 0-0.1,Ta 0-0.1,Ti 0-0.1,W 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	85	-	99	7439-89-6
Mn	0.6	-	5	7439-96-5
Si	0	-	2.5	7440-21-3
Cr	0	-	2	7440-47-3
Al	0	-	1	7429-90-5
Co	0	-	1	7440-48-4
Ni	0	-	1	7440-02-0
Cu	0	-	0.5	7440-50-8
Mo	0	-	0.5	7439-98-7
V	0	-	0.5	7440-62-2
C	0.2	-	0.4	7440-44-0
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
Ta	0	-	0.1	7440-25-7
Ti	0	-	0.1	7440-32-6
W	0	-	0.1	7440-33-7

IPCI C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]
IPCR C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon silicon titanium steel sheet
IT Galvanizing
(electrogalvanizing, layer; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Hot-dip galvanizing
(layer; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Collisions
(resistance; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT Microhardness
Tensile strength
Vickers hardness
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT 12597-69-2, Steel, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(sheet; steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)
IT 2572991-88-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(steel sheet comprising carbon, silicon and titanium with high strength and excellent collision resistance)

L13 ANSWER 2 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:2054532 CAPLUS Full-text
DOCUMENT NUMBER: 173:899795
TITLE: Strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets
AUTHOR(S): Jo, Min Cheol; Jo, Min Chul; Yoo, Jisung; Song, Taejin; Kim, Sang-Heon; Sohn, Seok Su; Lee, Sunghak
CORPORATE SOURCE: Center for Advanced Aerospace Materials, Pohang University of Science and Technology, Pohang, 37673, S. Korea
SOURCE: Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing

(2021), 800, 140319
CODEN: MSAPE3; ISSN: 0921-5093
DIGITAL OBJECT ID: 10.1016/j.msea.2020.140319
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB Layered architectures have been applied to twinning-induced plasticity (TWIP) steel in terms of configuring multi-layered TWIP and martensitic steel (MLS) sheets to overcome the limitation of low yield strength. However, hydrogen embrittlement (HE) inevitably appears in materials used for high-strength purposes, with the interfacial layers presenting localization sites of hydrogen, thereby limiting the materials' broad structural applications. Here, we present a novel design for MLS sheets that exhibit both strong resistance to HE and a good strength-ductility balance via surface shielding. Our hydrogen penetration data demonstrates that the proposed austenitic shielding structure effectively acts as a barrier to hydrogen due to the reduced hydrogen diffusivity, compared with existing MLS sheets. We propose the optimal surface thickness required to play the role of shielding layer based on the quantified diffusivity and the rule of mixts. of the layer fractions, which presents a plausible novel design for layered architectures that exhibit strong resistance to HE and possess tunable mech. properties.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1991		261	Electron Probe Quant	
Anon	2004			ISO 17081 Method of	
Ashby, M	2003	51	5801	Acta Mater	CAPLUS
Ashby, M	2013	68	4	Scripta Mater	CAPLUS
Barabash, R	2014	45	98	Metall Mater Trans	CAPLUS
Beachem, C	1972	3	441	Metall Mater Trans B	
Bouaziz, O	2008	10	24	Adv Eng Mater	CAPLUS
Bouaziz, O	2016	18	56	Adv Eng Mater	CAPLUS
Cetin, A	2012	60	2265	Acta Mater	CAPLUS
Chin, K	2018	24	489	Met Mater Int	CAPLUS
Cho, L	2018	734	416	Mater Sci Eng, A	CAPLUS
Cho, L	2018	735	448	Mater Sci Eng, A	CAPLUS
De Cooman, B	2011			New Trends and Devel	
Devanathan, M	1962	270	90	Proc R Soc A	CAPLUS
Dunne, D	2012	706	1568	Mater Sci Forum	
Dwivedi, S	2018	43	21603	Int J Hydrogen Energ	CAPLUS
Enomoto, M	2012	43	572	Metall Mater Trans	CAPLUS
Fang, T	2011	331	1587	Science	CAPLUS
Grassel, O	2000	16	1391	Int J Plast	CAPLUS
Gutierrez-Urrutia, I	2010	527	3552	Mater Sci Eng, A	
Gwon, H	2017	696	416	Mater Sci Eng, A	CAPLUS
Han, D	2015	99	45	Scripta Mater	CAPLUS
He, J	2018	726	288	Mater Sci Eng, A	CAPLUS
Huang, M	2018	153	235	Acta Mater	CAPLUS
Ichimura, M	1991	32	1109	Mater Trans, JIM	CAPLUS
Inoue, J	2008	59	1055	Scripta Mater	CAPLUS
Jin, J	2012	60	1680	Acta Mater	CAPLUS
Jo, M	2019	50	4085	Metall Mater Trans	CAPLUS
Jo, S	2015	627	374	J Alloys Compd	CAPLUS
Kim, J	2018	147	304	Acta Mater	CAPLUS
Kim, J	2009	505	105	Mater Sci Eng, A	
Kim, J	2017	682	164	Mater Sci Eng, A	CAPLUS
Kim, J	2019	25	912	Met Mater Int	CAPLUS
Kim, J	2019	9	6829	Sci Rep	
Koseki, T	2014	55	227	Mater Trans	CAPLUS
Koyama, M	2013	61	4607	Acta Mater	CAPLUS
Koyama, M	2017	355	1055	Science	CAPLUS
Kubin, L	2003	48	119	Scripta Mater	CAPLUS
Kwon, Y	2018	43	10129	Int J Hydrogen Energ	CAPLUS
Lee, J	2019	9	5219	Sci Rep	
Li, Y	2013	61	2588	J Mech Phys Solid	CAPLUS
Mohtadi-Bonab, M	2019	25	1109	Met Mater Int	CAPLUS
Oh, S	2020	188	366	Acta Mater	CAPLUS
Park, C	2019	25	584	Met Mater Int	CAPLUS
Park, I	2015	93	63	Corrosion Sci	CAPLUS
Park, J	2017	686	160	Mater Sci Eng, A	CAPLUS

Park, J |2019 |759 |320 |Mater Sci Eng, A |CAPLUS
Ritchie, R |2011 |10 |817 |Nat Mater |CAPLUS
Seok, M |2016 |121 |164 |Acta Mater |CAPLUS
Song, E |2014 |87 |9 |Scripta Mater |CAPLUS
Takai, K |2003 |43 |520 |ISIJ Int |CAPLUS
Wang, M |2005 |398 |37 |Mater Sci Eng, A |
Wang, Y |2002 |419 |912 |Nature |CAPLUS
Wang, Y |2018 |150 |22 |Scripta Mater |CAPLUS
Wei, Y |2014 |5 |3580 |Nat Commun |
Wu, X |2014 |2 |185 |Mater Res Lett |CAPLUS
Yanagimoto, J |2010 |59 |287 |CIRP Ann - Manuf Tec|
Yokota, T |2003 |43 |534 |ISIJ Int |CAPLUS
Yu, W |2018 |727 |70 |Mater Sci Eng, A |CAPLUS
Zhang, Y |2019 |165 |15 |Scripta Mater |CAPLUS

IT 2522569-69-1, C 0.35, Mn 1.3, Si 0.15, Mo 0.1, Cr 0.2, Ti 0-0.06, B 0-0.06, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

RN 2522569-69-1 CAPLUS

CN Steel, Fe 98,Mn 1.3,C 0.4,Cr 0.2,Si 0.2,Mo 0.1,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	98			7439-89-6
Mn	1.3			7439-96-5
C	0.4			7440-44-0
Cr	0.2			7440-47-3
Si	0.2			7440-21-3
Mo	0.1			7439-98-7
B	0	-	0.1	7440-42-8
Ti	0	-	0.1	7440-32-6

CC 55-8 (Ferrous Metals and Alloys)

ST TWIP steel multilayer austenite martensite shielding hydrogen embrittlement resistance

IT Diffusion
Elongation, mechanical
Fracture surface morphology
Hydrogen embrittlement
Interface
Microstructure
Multilayers
Sheet materials
Shields
Stress-strain relationship
Tensile strength
Yield strength
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 1333-74-0, Hydrogen, processes
RL: OCU (Occurrence, unclassified); PEP (Physical, engineering or chemical process); OCCU (Occurrence); PROC (Process)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 12173-93-2, Martensite, processes 12244-31-4, Austenite, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

IT 2362540-95-0, C 1.2, Mn 13, Si 0.2, Fe bal. 2522569-69-1, C 0.35, Mn 1.3, Si 0.15, Mo 0.1, Cr 0.2, Ti 0-0.06, B 0-0.06, Fe bal., processes 2522569-74-8, C 0.7, Mn 17, Si 0.6, V 0.3, Al 1.3, Fe bal.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(strong resistance to hydrogen embrittlement via surface shielding in multi-layered austenite/martensite steel sheets)

L13 ANSWER 3 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1569923 CAPLUS Full-text
DOCUMENT NUMBER: 173:359646
TITLE: Al-Fe-based plated steel sheet for hot press, and method for manufacturing hot press member
INVENTOR(S): Sato, Rinta; Nakajima, Seiji; Ando, Satoru
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2020122202	A	20200813	JP 2019-16283	20190131

PRIORITY APPLN. INFO.: JP 2019-16283 20190131

AB The title Al-Fe-based plated steel sheet can obtain a hot press member having excellent corrosion resistance after coating and excellent corrosion resistance at the joint portion while realizing a high temp. rising rate when subjected to heating by a furnace heating method performed before hot pressing. The Al-Fe-based plated steel sheet for hot press comprises a base steel sheet, an Al-Fe alloy plated layer formed on at least one surface of the base steel sheet with an adhesion amt. per one surface of 30-100 g/m2, having a compn. including Fe 25-90% by mass, Si 0-1% by mass and Al and unavoidable impurities as balance, and unalloyed Al attached to the surface of the Al-Fe alloy plated layer with an adhesion amt. per one surface of 0-90 mg/m2.

IT 1356847-15-8
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)

RN 1356847-15-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C22C0021-00 [I]; C22C0038-00 [I]; C22C0021-02 [I]; C22C0038-60 [I]; C21D0009-00 [I]; C21D0001-18 [I]
IPCR C23C0002-12 [I]; C21D0001-18 [I]; C21D0009-00 [I]; C22C0021-00 [I]; C22C0021-02 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C23C0002-28 [I]
CC 56-11 (Nonferrous Metals and Alloys)
ST aluminum iron plating steel sheet hot press
IT Heating
Hot-press molding
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)
IT 7429-90-5, Aluminum, processes 1356847-15-8 2460706-65-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Al-Fe-based plated steel sheet for hot press, and method for manufg. hot press member)

L13 ANSWER 4 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1063971 CAPLUS Full-text
DOCUMENT NUMBER: 173:85787
TITLE: Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

manufacturing method
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 23pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020108594	A1	20200604	WO 2019-CN121860	20191129
CN 109371325	A	20190222	CN 2018-11454798	20181130

PRIORITY APPLN. INFO.: CN 2018-11454798 A 20181130

AB Provided are a zinc-based plated hot-formed steel plate or steel strip having excellent cold bending performance, and a manufg. method thereof; said zinc-based plated hot-formed steel plate or steel strip comprises a substrate having a surface decarburized layer thickness of less than 20 um and a zinc-based plated layer having an adhesion amt. of 10 to 100 g/m.cxa. 2; the component wt. percentages of the substrate are: C: 0.1-0.8%, Si: 0.05-2.0%, Mn: 0.5-3.0%, P≤0.1%, S≤0.05%, Al≤0.1%, N≤0.01%; the remainder is Fe and unavoidable impurities; the av. size of original austenite grains of the substrate is less than 15 um. After hot forming of the substrate, the hot-formed steel plate or steel strip has a tensile strength of 1500 MPa and elongation after fracture of 5%, and the coating is continuous and complete, there are no cracks extending to the substrate, and the steel plate has excellent cold bending performance.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
AZUMA MASASHI	2011			JP 2011111675 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2019			CN 109371325 A	CAPLUS
JIN KWANG-KEUN	1996			KR 960005237 B1	
KAWATA HIROYUKI	2014			CN 103874776 A	CAPLUS
TAKEDA GENTARO	2018			WO 2018207560 A1	CAPLUS
TANAKA YUKIMOTO	2012			JP 2012251229 A	CAPLUS
YUANQIANG TU	2010			CN 101880832 A	CAPLUS
ZHOU SHU	2016			CN 106244923 A	CAPLUS
ZHOU SHU	2016			CN 106244923 A	CAPLUS

IT 2293976-55-1D, Aluminum 0-0.1, carbon 0.1-0.8, manganese 0.5-3, phosphorus 0-0.1, silicon 0.05-2, Cr 0-1, Mo 0-1, Ti 0-0.2, Nb 0-0.08, V 0-1, B 0-0.08, iron bal., nitrogen 0-0.01
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	91 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
C	0.1 - 0.8	7440-44-0
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-60 [I]; C22C0038-06 [I]; C23C0002-40 [I]; C21D0008-02 [I]
IPCR C22C0038-02 [I]; C21D0008-02 [I]; C22C0038-04 [I]; C22C0038-06 [I];

C22C0038-60 [I]; C23C0002-40 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST cold bending performance zinc coating steel manuf hot stamping
IT Coating materials
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT Galvanized steel
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT Metalworking
(stamping, hot; Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT 2293976-55-1D, Aluminum 0-0.1, carbon 0.1-0.8, manganese 0.5-3, phosphorus 0-0.1, silicon 0.05-2, Cr 0-1, Mo 0-1, Ti 0-0.2, Nb 0-0.08, V 0-1, B 0-0.08, iron bal., nitrogen 0-0.01
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)
IT 7440-66-6, Zinc, processes 98357-26-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Zinc-coated hot-stamped steel plate or strip with excellent cold bending performance and its manufg. method)

L13 ANSWER 5 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1063958 CAPLUS Full-text
DOCUMENT NUMBER: 173:85818
TITLE: Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 17pp.; Chemical Indexing Equivalent to 170:379972 (CN)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020108593	A1	20200604	WO 2019-CN121859	20191129
CN 109365606	A	20190222	CN 2018-11453322	20181130
PRIORITY APPLN. INFO.:			CN 2018-11453322 A	20181130

AB A method for forming a zinc-plated steel plate or steel belt having good corrosion resistance, comprising the following steps: 1) conveying the steel plate or steel belt into a heating furnace higher than Ac3, austenitizing the steel plate or steel belt, and keeping the temp. for 1-7 min; 2) before the steel plate or steel belt leaves the heating furnace and enters a forming mold, applying different cooling manners according to different plated thicknesses, wherein when the single-sided wt. of the plating is less than or equal to 50g/m2, only air cooling is required before transferring to the forming mold, when the single-sided wt. of the plating is greater than 50g/m2, aerial fog or water mist precooling is performed before transferring to the forming mold, and the steel plate is cooled to be below 700°C at a cooling sped greater than 30°C/s; and 3) rapidly transferring the steel plate or steel belt to the mold for hot stamping forming, wherein a transferring duration does not exceed 1 min, and the temp. of the hot stamping forming is controlled between 400-800°C. The tensile strength of the steel plate or steel belt after hot stamping is greater than 1,450 MPa, and substrate cracks caused by local press and LME in an element are avoided.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File

AKIRA OBAYASHI	2005			CN 1600877 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2017			CN 107127238 A	CAPLUS
BI WENZHEN	2019			CN 109365606 A	CAPLUS
KOJIMA TAKESHI	2017			CN 106756697 A	CAPLUS
SEKIDO YOSHITO	2013			JP 2013227614 A	CAPLUS
TAKEBAYASHI SHIGETO	2009			JP 2009228134 A	CAPLUS
WILHELM WARNECKE	2010			CN 101849029 A	CAPLUS
YI HONGLIANG	2015			CN 104846274 A	CAPLUS

IT 2293976-55-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	91 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
C	0.1 - 0.8	7440-44-0
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI B21D0022-02 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C22C0018-00 [I]; C21D0008-02 [I]
IPCR B21D0022-02 [I]; C21D0008-02 [I]; C22C0018-00 [I]; C23C0002-06 [I]; C23C0002-40 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST corrosion resistance zinc alloy coating steel hot stamping
IT Anticorrosive coating materials
Coating materials
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT Metalworking
(stamping, hot; Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2293976-55-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
IT 2226545-76-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)

L13 ANSWER 6 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:1041904 CAPLUS Full-text
DOCUMENT NUMBER: 173:612711
TITLE: Aluminum or aluminum alloy plated steel differential strength welded part and its manufacture
INVENTOR(S): Pan, Hua; Liu, Chengjie; Lei, Ming; Wu, Yue; Sun, Zhongqu; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 12pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 111215751	A	20200602	CN 2019-10249188	20190329
WO 2020200110	A1	20201008	WO 2020-CN81743	20200327

PRIORITY APPLN. INFO.: CN 2019-10249188 A 20190329

AB The invention discloses a steel differential strength welding part with an aluminum or aluminum alloy coating and a manufg. method thereof, wherein the steel differential strength welding part is formed by butt welding a high-strength steel plate and a low-strength steel plate, and the high-strength steel plate and the low-strength steel plate comprise a substrate and at least one of the surfaces of the substrate and the substrate is a pure aluminum or aluminum alloy coating; the high-strength steel plate matrix comprises the following components in percentage by wt.: c 0.08-0.8%, Si 0.05-1.0%, Mn 0.1-5%, P <0.3%, S <0.1%, Al <0.3%, Ti <0.5%, B 0.0005-0.1%, Cr 0.01-3%, residual Fe and inevitable impurities; the low-strength steel plate matrix comprises the following components in percentage by wt.: c 0.03-0.1%, Si 0-0.1%, Mn 1.0-2.0%, P <0.1%, S <0.05%, Al <0.1%, Cr 0-0.1%, Ti 0-0.05%, balance of Fe and inevitable impurities. The tensile strength of the welded part after hot stamping is greater than that of a low-strength steel base metal, the elongation is greater than 4%, and the application requirements of the welded part in the field of automobile hot stamping are met.

IT 2067242-22-0, C 0.08-0.8, Si 0.05-1, Mn 0.1-5, P 0-0.3, S 0-0.1, Al 0-0.3, Ti 0-0.5, B 0.0005-0.1, Cr 0.01-3, Fe bal.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

RN 2067242-22-0 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B23K0026-26; B23K0026-322; B23K0026-12; C22C0038-38; C22C0038-32; C22C0038-28; C22C0038-06; C22C0038-04; C22C0038-02

IPCR B23K0026-26 [I]; B23K0026-12 [I]; B23K0026-322 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I]; C22C0038-32 [I]; C22C0038-38 [I]

CC 55-9 (Ferrous Metals and Alloys)

ST r aluminum alloy plated steel differential strength welded part

IT Laser welding
Plating process
Tensile strength
Welds
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT Welding of metals
(gas metal-arc welding; aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT 2067242-22-0, C 0.08-0.8, Si 0.05-1, Mn 0.1-5, P 0-0.3, S 0-0.1, Al 0-0.3, Ti 0-0.5, B 0.0005-0.1, Cr 0.01-3, Fe bal. 2490151-15-8, C 0.03-0.1, Si 0-0.1, Mn 0.5-2, Al 0-0.1, Cr 0-0.1, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT 2490151-16-9, C 0.1-0.25, Si 0.2-0.4, Mn 1.2-2, Al 0-0.06, Ti 0.02-0.08,

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Cr 0.05-0.2, Fe bal., processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

IT 7429-90-5, Aluminum, uses 1273096-81-3, Aluminum alloy
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum or aluminum alloy plated steel differential strength welded part and its manuf.)

L13 ANSWER 7 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:185423 CAPLUS Full-text
DOCUMENT NUMBER: 172:169762
TITLE: Manufacture of hardened steel products with aluminum-based coatings
INVENTOR(S): Pohl, Stefan; Danger, Elisabeth; Labudde, Thorsten; Butzkamm, Juergen
PATENT ASSIGNEE(S): Muhr und Bender KG, Germany
SOURCE: PCT Int. Appl., 29pp.; Chemical Indexing Equivalent to 172:169761 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2020020644	A1	20200130	WO 2019-EP68581	20190710
DE 102018118015	A1	20200130	DE 2018-102018118015	20180725

PRIORITY APPLN. INFO.: DE 2018-102018118015 A 20180725

AB A method for producing a hardened steel product, comprises: providing a steel substrate made of a hardenable steel; coating the steel substrate with an aluminum pre-coating, the pre-coating being applied to the steel substrate with a thickness of at least 34μm; flexibly rolling the pre-coated steel substrate in order to produce a variable thickness over the length of the pre-coated steel substrate, the pre-coating being rolled out to a reduced first thickness of less than 33μm in thinner first portions and to a reduced second thickness, which is thicker than the reduced first thickness, in thicker second portions; creating a blank from the flexibly rolled steel substrate; heating the blank to the austenitization temp., diffusion processes between the base material and the pre-coating occurring; and hot-forming the heated blank, the heated blank being formed and being quickly cooled in such a way that a hardened steel product having a coating is produced.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
BATISTA LEONARDO MESQUI	2019			EP 3489386 A1	CAPLUS
Hauger, A	1995	23	40	Fertigung	
KIM HEUNG-YUN	2018			US 20180142337 A1	
MACHADO AMORIM	2017			WO 2017017521 A1	CAPLUS
SCHNEIDER DR CHRISTOPH	2017			EP 3181248 A1	
TANAHASHI HIROYUKI	2014			US 20140044987 A1	
WINKLHOFER KERRY	2008			DE 102007019196 A1	CAPLUS
Windmann, M	2014	246	17	Surface And Coatings	CAPLUS

IT 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)
RN 2408930-78-7 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-5,Cr 0-1,Mo 0-1,Si 0.1-0.9,C 0.2-0.5,Ti 0-0.2,V 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Nb 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	91 - 99	7439-89-6
Mn	0.5 - 5	7439-96-5

Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Si	0.1	-	0.9	7440-21-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Nb	0	-	0.1	7440-03-1
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C21D0001-673 [I]; B21B0037-24 [I]; B21B0037-26 [I]; C23C0002-12 [I]
IPCR C21D0001-673 [I]; B21B0037-24 [I]; B21B0037-26 [I]; C23C0002-12 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST hardened steel aluminum alloy coating silicon austenizing rolling
IT Diffusion
Heat treatment
Hot-dip coating process
Metal forming
Rolling (metals)
Thermomechanical metalworking
(manuf. of hardened steel products with aluminum-based coatings)
IT Oxides (inorganic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(manuf. of hardened steel products with aluminum-based coatings)
IT 7429-90-5, Aluminum, processes 77578-10-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; manuf. of hardened steel products with aluminum-based coatings)
IT 12597-69-2, Steel, processes 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

L13 ANSWER 8 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2020:178086 CAPLUS Full-text
DOCUMENT NUMBER: 172:169761
TITLE: Manufacture of hardened steel products with aluminum-based coatings
INVENTOR(S): Pohl, Stefan; Danger, Elisabeth; Labudde, Thorsten; Butzkamm, Juergen
PATENT ASSIGNEE(S): Muhr und Bender KG, Germany
SOURCE: Ger. Offen., 13pp.; Chemical Indexing Equivalent to 172:169762 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102018118015	A1	20200130	DE 2018-102018118015	20180725
WO 2020020644	A1	20200130	WO 2019-EP68581	20190710

PRIORITY APPLN. INFO.: DE 2018-102018118015 A 20180725
AB A method for producing a hardened steel product, comprises: providing a steel substrate made of a hardenable steel; coating the steel substrate with an aluminum pre-coating, the pre-coating being applied to the steel substrate with a thickness of at least 34μm; flexibly rolling the pre-coated steel substrate in order to produce a variable thickness over the length of the pre-coated steel substrate, the pre-coating being rolled out to a reduced first thickness of less than 33μm in thinner first portions and to a reduced second thickness, which is thicker than the reduced first thickness, in thicker second portions; creating a blank from the flexibly rolled steel substrate; heating the

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blank to the austenitization temp., diffusion processes between the base material and the pre-coating occurring; and hot-forming the heated blank, the heated blank being formed and being quickly cooled in such a way that a hardened steel product having a coating is produced.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102005031461 A1	CAPLUS
Anon				DE 102007013739 B3	CAPLUS
Anon				DE 102007019196 A1	CAPLUS
Anon				DE 102009007909 A1	CAPLUS
Anon	2019			Feuerverzinken In:Wi	
Anon				Salzgitter Flachstah	

IT 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

RN 2408930-78-7 CAPLUS

CN Iron alloy, base, Fe 91-99,Mn 0.5-5,Cr 0-1,Mo 0-1,Si 0.1-0.9,C 0.2-0.5,Ti 0-0.2,V 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Nb 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
Mn	0.5	-	5	7439-96-5
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Si	0.1	-	0.9	7440-21-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
V	0	-	0.2	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Nb	0	-	0.1	7440-03-1
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C23F0017-00 [I]; C23C0002-12 [I]; C22C0038-04 [I]
IPCR C23F0017-00 [I]; C22C0038-04 [I]; C23C0002-12 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST hardened steel aluminum alloy coating silicon austenizing rolling
IT Diffusion
Heat treatment
Hot-dip coating process
Metal forming
Rolling (metals)
Thermomechanical metalworking
(manuf. of hardened steel products with aluminum-based coatings)
IT Oxides (inorganic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(manuf. of hardened steel products with aluminum-based coatings)
IT 7429-90-5, Aluminum, processes 77578-10-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; manuf. of hardened steel products with aluminum-based coatings)
IT 12597-69-2, Steel, processes 2408930-78-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrates; manuf. of hardened steel products with aluminum-based coatings)

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ACCESSION NUMBER: 2019:1450710 CAPLUS Full-text
TITLE: The influence of the heating rate of cemented constructional steels on the growth of austenitic grain in the process of high-temperature holding
AUTHOR(S): Kukareko, V. A.; Valko, A. L.; Chichin, A. N.
CORPORATE SOURCE: Joint Institute of Mechanical Engineering of the National Academy of Sciences of Belarus, Minsk, Belarus
SOURCE: Vestsi Natsyyanal'nai Akademii Navuk Belarusi, Seryya Fizika-Tekhnichnykh Navuk (2018), (4), 399-406
CODEN: VABNFA; ISSN: 1561-8358
DIGITAL OBJECT ID: 10.29235/1561-8358-2018-63-4-399-406
PUBLISHER: Vydavetski Dom "Belaruskaya Navuka"
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB The influence of the heating mode of samples of constructional cemented steels 20KhNZA, 20KhGNR and 15KhGN2TA on the value of austenite grain after high-temp. isothermal aging at 1000 °C is studied. It is shown that the heating of steels at a rate of 1.2-3.0 °C/min in the phase-transformation interval stabilizes the grain structure of the steels and leads to a slowing down of the kinetics of the growth of austenite grains during prolonged high-temp. aging, which makes it possible to increase the temp. of the chem.-thermal treatment of steels. It is concluded that the stabilization of the grain structure of steels is assocd. with the formation of segregation of impurity atoms and particles at grain boundaries with high-angle disorientation during slow heating, which prevents migration of grain boundaries in the process of prolonged high-temp. aging. A high-temp. chem.-thermal treatment of a batch of billets from steel 20KhNZA under exptl. conditions with stepwise heating in the phase-transformation interval provided a qual. fine-grained structure of the cemented layer.

IT INDEXING IN PROGRESS
IT 37312-00-8, 20KhGNR
RL: TEM (Technical or engineered material use); USES (Uses)
(influence of heating rate of cemented constructional steels on growth of austenitic grain in process of high-temp. holding)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55 (Ferrous Metals and Alloys)
ST steel austenitic grain growth heating rate holding temp
IT Grain boundaries
Grain size
Heat treatment
Microhardness
Microstructure
Quenching (cooling)
(influence of heating rate of cemented constructional steels on growth of austenitic grain in process of high-temp. holding)
IT 37312-00-8, 20KhGNR 61431-72-9, 15KhGN2TA
RL: TEM (Technical or engineered material use); USES (Uses)
(influence of heating rate of cemented constructional steels

on growth of austenitic grain in process of high-temp. holding)

L13 ANSWER 10 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1254928 CAPLUS Full-text
DOCUMENT NUMBER: 171:98349
TITLE: Production of cold-rolled flat steel products having metal anti-corrosion layers
INVENTOR(S): Mraczek, Klemens; Muhr, Andreas; Haneder, Bernhard
PATENT ASSIGNEE(S): Voestalpine Stahl GmbH, Austria
SOURCE: PCT Int. Appl., 38pp.; Chemical Indexing Equivalent to 171:98344 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019121793	A1	20190627	WO 2018-EP85664	20181218
DE 102017223633	A1	20190627	DE 2017-102017223633	20171221
EP 3728654	A1	20201028	EP 2018-826307	20181218
US 20200325552	A1	20201015	US 2020-16956301	20200619

PRIORITY APPLN. INFO.: DE 2017-102017223633 A 20171221
WO 2018-EP85664 W 20181218
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A cold-rolled flat steel contains, in addn. to iron and unavoidable impurities, (in wt.%): C: 0.01-0.35%, Mn: 1-4%, Si: 0.5-2.5%, Nb: up to 0.1%, Ti: 0.015-0.1%, P: up to 0.1%, Al: up to 0.15%, S: up to 0.01%, N: up to 0.1%, and optionally one or more elements from the group of rare earth metals, Mo, Cr, Zr, V, W, Co, Ni, B, Cu, Ca, with rare earth metals: up to 0.2%, Mo: up to 1%, Cr: up to 3%, Zr: up to 1%, V: up to 1%, W: up to 1%, Co: up to 1%, Ni: up to 2%, B: up to 0.1%, Cu: up to 3%, Ca: up to 0.015%. The flat steel products are manufd. by: melting then casting the steel melt to form a semi-finished product; hot-rolling the semi-finished product at 820-1000°C to form a hot strip; winding the hot strip at a temp. between room temp. and 750°C to form a coil; annealing the hot strip at 530-950°C for 1-50 h; cold-rolling the annealed hot strip to form a cold-rolled flat steel product in one or more stages with a total cold-rolling degree of at least 45%; final annealing of the cold-rolled flat steel product at 650-920°C for 30-1500 s; and applying a zinc-based metal anti-corrosion layer by electrolytic galvanizing or hot dip galvanizing of the cold-rolled and finally-annealed flat steel product. As a result of the final annealing of the cold-rolled flat steel product, an Si enrichment layer is created between a surface and a base material of the cold-rolled and finally-annealed flat steel product, the max. Si content of which is higher by a factor of 3-8 than the Si content of the base material and which has a depth of 10 nm to 1 μm.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ARLAZAROV ARTEM	2017			EP 3146083 A1	CAPLUS
HAGA JUN	2013			JP 2013032582 A	CAPLUS
NAKAGAITO TATSUYA	2007			JP 2007224416 A	CAPLUS

IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
RN 2351042-49-2 CAPLUS
CN Iron alloy, base, Fe 78-98,Mn 1-4,Cr 0-3,Cu 0-3,Si 0.5-2.5,Ni 0-2,Al 0-1.5,Co 0-1,Mo 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.4,misch metal 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1,N 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	78 - 98	7439-89-6
Mn	1 - 4	7439-96-5

Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Si	0.5	-	2.5	7440-21-3
Ni	0	-	2	7440-02-0
Al	0	-	1.5	7429-90-5
Co	0	-	1	7440-48-4
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
W	0	-	1	7440-33-7
Zr	0	-	1	7440-67-7
C	0	-	0.4	7440-44-0
Misch metal	0	-	0.2	8049-20-5
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8
N	0	-	0.1	17778-88-0
P	0	-	0.1	7723-14-0

IPCI C21D0006-00 [I]; B21B0001-24 [I]; B21B0001-26 [I]; B21B0001-28 [I];
C21D0007-02 [I]; C21D0007-10 [I]; C21D0008-02 [I]; C21D0008-04 [I];
C23C0002-00 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C21D0001-26 [I];
C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-12 [I]; C22C0038-14 [I];
C25F0001-06 [I]; C23G0001-08 [I]; B21B0001-22 [I]
IPCR C21D0006-00 [I]; B21B0001-22 [I]; B21B0001-24 [I]; B21B0001-26 [I];
B21B0001-28 [I]; C21D0001-26 [I]; C21D0007-02 [I]; C21D0007-10 [I];
C21D0008-02 [I]; C21D0008-04 [I]; C21D0009-46 [I]; C21D0009-48 [I];
C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-12 [I]; C22C0038-14 [I];
C23C0002-00 [I]; C23G0001-08 [I]; C25F0001-06 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST cold rolling annealing flat steel zinc anticorrosion coating
IT Galvanizing
(electrogalvanizing; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT Annealing
Anticorrosive coating materials
Casting of metals
Cold rolling
Hot rolling
Hot-dip galvanizing
(prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 7440-66-6P, Zinc, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

L13 ANSWER 11 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1241982 CAPLUS Full-text
DOCUMENT NUMBER: 171:98344
TITLE: Production of cold-rolled flat steel products having metal anti-corrosion layers
INVENTOR(S): Mraczek, Klemens; Muhr, Andreas; Haneder, Bernhard
PATENT ASSIGNEE(S): Voestalpine Stahl GmbH, Austria
SOURCE: Ger. Offen., 17pp.; Chemical Indexing Equivalent to 171:98349 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017223633	A1	20190627	DE 2017-102017223633	20171221

WO 2019121793	A1	20190627	WO 2018-EP85664		20181218
EP 3728654	A1	20201028	EP 2018-826307		20181218
US 20200325552	A1	20201015	US 2020-16956301		20200619
PRIORITY APPLN. INFO.:			DE 2017-102017223633	A	20171221
			WO 2018-EP85664	W	20181218

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A cold-rolled flat steel contains, in addn. to iron and unavoidable impurities, (in wt.%): C: 0.01-0.35%, Mn: 1-4%, Si: 0.5-2.5%, Nb: up to 0.1%, Ti: 0.015-0.1%, P: up to 0.1%, Al: up to 0.15%, S: up to 0.01%, N: up to 0.1%, and optionally one or more elements from the group of rare earth metals, Mo, Cr, Zr, V, W, Co, Ni, B, Cu, Ca, with rare earth metals: up to 0.2%, Mo: up to 1%, Cr: up to 3%, Zr: up to 1%, V: up to 1%, W: up to 1%, Co: up to 1%, Ni: up to 2%, B: up to 0.1%, Cu: up to 3%, Ca: up to 0.015%. The flat steel products are manufd. by: melting then casting the steel melt to form a semi-finished product; hot-rolling the semi-finished product at 820-1000°C to form a hot strip; winding the hot strip at a temp. between room temp. and 750°C to form a coil; annealing the hot strip at 530-950°C for 1-50 h; cold-rolling the annealed hot strip to form a cold-rolled flat steel product in one or more stages with a total cold-rolling degree of at least 45%; final annealing of the cold-rolled flat steel product at 650-920°C for 30-1500 s; and applying a zinc-based metal anti-corrosion layer by electrolytic galvanizing or hot dip galvanizing of the cold-rolled and finally-annealed flat steel product. As a result of the final annealing of the cold-rolled flat steel product, an Si enrichment layer is created between a surface and a base material of the cold-rolled and finally-annealed flat steel product, the max. Si content of which is higher by a factor of 3-8 than the Si content of the base material and which has a depth of 10 nm to 1 μm.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102012013113 A1	CAPLUS
Anon				DE 102015111866 A1	CAPLUS
Anon				DE 102015112886 A1	CAPLUS
Anon				DE 102015112889 A1	CAPLUS
Anon				EP 2383353 A2	CAPLUS

IT 2351042-49-2P

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

RN 2351042-49-2 CAPLUS

CN Iron alloy, base, Fe 78-98,Mn 1-4,Cr 0-3,Cu 0-3,Si 0.5-2.5,Ni 0-2,Al 0-1.5,Co 0-1,Mo 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.4,misch metal 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1,N 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	78 - 98	7439-89-6
Mn	1 - 4	7439-96-5
Cr	0 - 3	7440-47-3
Cu	0 - 3	7440-50-8
Si	0.5 - 2.5	7440-21-3
Ni	0 - 2	7440-02-0
Al	0 - 1.5	7429-90-5
Co	0 - 1	7440-48-4
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
W	0 - 1	7440-33-7
Zr	0 - 1	7440-67-7
C	0 - 0.4	7440-44-0
Misch metal	0 - 0.2	8049-20-5
Nb	0 - 0.2	7440-03-1
Ti	0 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8
N	0 - 0.1	17778-88-0
P	0 - 0.1	7723-14-0

IPCI C22C0038-04 [I]; C22C0038-38 [I]; C22C0038-42 [I]; C22C0038-20 [I]
IPCR C22C0038-04 [I]; C22C0038-20 [I]; C22C0038-38 [I]; C22C0038-42 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST cold rolling annealing flat steel zinc anticorrosion coating
IT Galvanizing
(electrogalvanizing; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT Annealing
Anticorrosive coating materials
Casting of metals
Cold rolling
Hot rolling
Hot-dip galvanizing
(prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 7440-66-6P, Zinc, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)
IT 2351042-49-2P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(sheets; prodn. of cold-rolled flat steel products having metal anti-corrosion layers)

L13 ANSWER 12 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:1019962 CAPLUS Full-text
DOCUMENT NUMBER: 171:30626
TITLE: Ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels
AUTHOR(S): Park, Jaeyeong; Jo, Min Cheol; Song, Taejin; Kim, Hyoung Seop; Sohn, Seok Su; Lee, Sunghak
CORPORATE SOURCE: Center for Advanced Aerospace Materials, Pohang University of Science and Technology, Pohang, 790-784, S. Korea
SOURCE: Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing (2019), 759, 320-328
CODEN: MSAPE3; ISSN: 0921-5093
DIGITAL OBJECT ID: 10.1016/j.msea.2019.05.046
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB An austenitic Hadfield steel sheet shows a relatively low yield strength of 0.4-0.5 GPa and serrated flows in spite of excellent tensile strength and ductility along with highly-sustained strain hardening. In order to overcome the shortcomings, a multi-layer steel (MLS) sheet was fabricated by a roll-bonding with an ultra-high-strength martensitic hot-press-forming (HPF) steel sheet. Near the Hadfield/HPF interface, the carburized and decarburized layers were formed by the carbon diffusion from the Hadfield (1.2% of C) to HPF (0.23% of C) layers, and could generate a kind of very thin multi-layers of 35 μm in thickness. All tensile properties of the Hadfield/HPF MLS sheet (yield strength; 946 MPa, tensile strength; 1291 MPa, elongation; 44.5%) were superior to those of the Hadfield sheet. Interestingly, the persistent elongation up to 44.5%, which is higher than that of the Hadfield steel, in the present MLS sheet is a quite unique and interesting characteristic. The simultaneous enhancement of strength and ductility of the MLS sheet was explained by the contributions of (1) populated twin formation, (2) generation of geometrically necessary dislocations (GNDs), and (3) increase of back stress inside thin interfacial layers.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				K. Sato, Q. Yu, J. H	
Barbier, D	2009	500	196	Mater Sci Eng A	

Bouaziz, O	2016	18	56	Adv Eng Mater	CAPLUS
Calcagnotto, M	2011	59	658	Acta Mater	CAPLUS
Cetin, A	2012	60	2265	Acta Mater	CAPLUS
Chateau, J	2010	240	012023	J Phys Conf Ser	
Chen, L	2007	47	1804	ISIJ Int	CAPLUS
Curtze, S	2010	58	5129	Acta Mater	CAPLUS
Dini, G	2010	64	15	Mater Lett	CAPLUS
Dinsdale, A	1991	15		Calphad	CAPLUS
Dumay, A	2008	483-4	184	Mater Sci Eng A	
Eshelby, J	1951	42	351	Lond Edinb Dublin Ph	
Fan, D	2009	80	241	Steel Res Int	CAPLUS
Frommeyer, G	2003	43	438	ISIJ Int	CAPLUS
Grassel, O	2000	16	1391	Int J Plast	CAPLUS
Gwon, H	2019	25	594	Met Mater Int	CAPLUS
Han, Y	2012	553	192	Mater Sci Eng A	CAPLUS
Hild, F	2006	42	69	Strain	
Hirth, J	1982			Theory of Dislocatio	
Inoue, J	2008	59	1055	Scripta Mater	CAPLUS
Kang, M	2017	700	387	Mater Sci Eng A	CAPLUS
Kang, S	2010	527	745	Mater Sci Eng A	
Kim, J	2019			Met Mater Int	
Koseki, T	2014	55	227	Mater Trans	CAPLUS
Kubin, L	2003	48	119	Scripta Mater	CAPLUS
Kurt, B	2009	60	1035	Mater Char	CAPLUS
Laws, N	1977	7	91	J Elast	
Lebedkina, T	2009	519	147	Mater Sci Eng A	
Lee, D	1988	23	558	J Mater Sci	CAPLUS
Lee, Y	2000	31	355	Metall Mater Trans A	
Li, Y	2018	731	377	Mater Sci Eng A	CAPLUS
Liu, B	2017	679	172	Mater Sci Eng A	CAPLUS
Ma, X	2016	116	43	Acta Mater	CAPLUS
Matlock, D	2012	15	1	JESTECH	
Morito, S	2005	45	91	ISIJ Int	CAPLUS
Nambu, S	2009	69	1936	Compos Sci Technol	CAPLUS
Nambu, S	2009	60	221	Scripta Mater	CAPLUS
Ojima, M	2009	529	16	Mater Sci Eng A	
Ojima, M	2012	66	139	Scripta Mater	CAPLUS
Pan, B	2009	20	1	Meas Sci Technol	
Park, J	2017	7	40231	Sci Rep	CAPLUS
Park, K	2001	7	95	Met Mater Int	CAPLUS
Saleh, A	2011	528	4537	Mater Sci Eng A	
Scott, C	2011	102	538	Int J Mater Res	CAPLUS
Semiatin, S	1979	10	85	Metall Trans A	
Seok, M	2016	121	164	Acta Mater	CAPLUS
Srivastava, A	2008	43	5654	J Mater Sci	CAPLUS
Ueji, R	2012	47	7946	J Mater Sci	CAPLUS
Ueji, R	2008	59	963	Scripta Mater	CAPLUS
Wu, X	2015	112	14501	Proc Natl Acad Sci U	CAPLUS
Xie, G	2011	52	1709	Mater Trans	CAPLUS
Yan, F	2014	81	487	Acta Mater	CAPLUS
Yang, M	2016	4	145	Mater Res Lett	CAPLUS
Yang, W	1990	25	1821	J Mater Sci	CAPLUS
Zuidema, B	1987	18	1629	Metall Trans A	

IT 2334123-60-1, Fe bal., C 0.23, Mn 1.2, Si 0.41, Cr 0.2, Ti 0-0.06, B 0-0.06, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels)
RN 2334123-60-1 CAPLUS
CN Steel, Fe 98,Mn 1.2,Si 0.4,C 0.2,Cr 0.2,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	98	7439-89-6
Mn	1.2	7439-96-5
Si	0.4	7440-21-3
C	0.2	7440-44-0
Cr	0.2	7440-47-3
B	0 - 0.1	7440-42-8

Ti 0 - 0.1 7440-32-6

CC 55-12 (Ferrous Metals and Alloys)
ST steel multilayer sheet strength ductility microstructure
IT Elongation, mechanical
Hot-press molding
Microstructure
Multilayers
Sheet materials
Solid-solid interface
Strain hardening
Stress-strain relationship
Tensile strength
Yield strength
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels)
IT 2334123-57-6, Fe bal., C 1.2, Mn 13.6, Si 0.2 2334123-60-1, Fe bal., C 0.23, Mn 1.2, Si 0.41, Cr 0.2, Ti 0-0.06, B 0-0.06, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ultra-high strength and excellent ductility in multi-layer steel sheet of austenitic hadfield and martensitic hot-press-forming steels)
OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

L13 ANSWER 13 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:949375 CAPLUS Full-text
DOCUMENT NUMBER: 170:609630
TITLE: Al plated steel pipe parts by STAF method
INVENTOR(S): Maki, Jun; Fujita, Soshi; Nakamura, Toyomitsu
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 21pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2019073778	A	20190516	JP 2017-201702	20171018
PRIORITY APPLN. INFO.:			JP 2017-201702	20171018

AB The present invention relates to an Al plated steel pipe parts comprising a hollow portion having a predetd. cross-sectional shape; and a flange portion projecting from the outer surface of the hollow portion; wherein the hollow portion and the flange portion are made of the same steel material as a material, and the surface of the hollow portion and the flange portion is coated with a plating layer contg. at least one of an Al-Fe-based alloy and an Al-Fe-Si-based alloy. The Al plated steel pipe parts has thickness of the plating layer is in the range of 5-50 μm, and the surface roughness of the plating layer at the flange portion is in the range of 0.3-1.2 μ m as a center line av. roughness Ra defined by JIS B0610. The Al-plated steel pipe part has excellent spot weldability manufd. by processing an Al-plated steel pipe by the STAF method.
IT 2320493-55-6, Aluminum 0-0.1, boron 0.0001-0.1, carbon 0.15-0.5, chromium 0-1.5, iron bal., manganese 0.6-3, nitrogen 0-0.006, phosphorus 0-0.01, silicon 0.01-2, titanium 0.01-0.1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum plated steel pipe parts by STAF method)
RN 2320493-55-6 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.6-3,Si 0-2,Cr 0-1.5,C 0.2-0.5,Al 0-0.1,B 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	93 - 99	7439-89-6
Mn	0.6 - 3	7439-96-5

Si	0	-	2	7440-21-3
Cr	0	-	1.5	7440-47-3
C	0.2	-	0.5	7440-44-0
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Ti	0	-	0.1	7440-32-6

IPCI C23C0002-12 [I]; C23C0002-26 [I]; C22C0038-00 [I]; C22C0038-04 [I]; C22C0038-38 [I]; B21D0026-035 [N]; B21D0026-059 [N]; C22C0021-02 [N]; C21D0009-08 [N]
IPCR C23C0002-12 [I]; C22C0038-00 [I]; C22C0038-04 [I]; C22C0038-38 [I]; C23C0002-26 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST aluminum plating steel pipe parts
IT Coating materials
Pipes and Tubes
(aluminum plated steel pipe parts by STAF method)
IT 12043-58-2
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(aluminum plated steel pipe parts by STAF method)
IT 2320493-55-6, Aluminum 0-0.1, boron 0.0001-0.1, carbon 0.15-0.5, chromium 0-1.5, iron bal., manganese 0.6-3, nitrogen 0-0.006, phosphorus 0-0.01, silicon 0.01-2, titanium 0.01-0.1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum plated steel pipe parts by STAF method)
IT 1314-13-2, Zinc oxide, uses 7429-90-5, Aluminum, uses 11114-60-6 11116-16-8, Titanium nitride 11122-26-2 12705-37-2, Chromium nitride
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum plated steel pipe parts by STAF method)

L13 ANSWER 14 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:903363 CAPLUS Full-text
DOCUMENT NUMBER: 170:588989
TITLE: Piercer plug made of seamless steel, and its manufacturing method
INVENTOR(S): Hidaka, Yasuyoshi; Shirasawa, Naoya; Miyai, Tatsuya
PATENT ASSIGNEE(S): Nippon Steel Corporation, Japan
SOURCE: PCT Int. Appl., 27pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019087510	A1	20190509	WO 2018-JP29879	20180809
CN 111315906	A	20200619	CN 2018-80071094	20180809
BR 112020002943	A2	20200811	BR 2020-112020002943	20180809
EP 3705591	A1	20200909	EP 2018-874192	20180809
US 20200263282	A1	20200820	US 2020-16646739	20200312

PRIORITY APPLN. INFO.: JP 2017-212753 A 20171102
WO 2018-JP29879 W 20180809
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The piercer plug comprises the following component in mass (%): 0.15-0.3 of carbon, 0.4-1.2 of silicon, 0.2-1.5 of manganese, 0.1-2 of nickel, 0-4 each of molybdenum and tungsten, 1-4 of chromium, 0-0.2 of boron, 0-1 of niobium , 0-1 of vanadium, 0-1 of titanium, and iron being balance and impurities. The piercer plug further comprises a tip section and a body section made of the same material; wherein the body section includes a cylindrical unit which is a hole for attaching a bar and the tip section is harder than the cylindrical unit. The manufg. method of piercer plug comprises a protective film forming on the surface of the piercer plug to the heating, wherein the protective film is a thermal sprayed coating and a buildup layer. According to the present invention, it is possible to provide a highly recyclable piercer plug.
IT 2315454-12-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(piercer plug made of seamless steel, and its manufg. method)
RN 2315454-12-5 CAPLUS

CN Iron alloy, base, Fe 82-97,Cr 1-4,Mo 0-4,W 0-4,Ni 0.1-2,Mn 0.2-1.5,Si 0.4-1.2,Nb 0-1,Ti 0-1,V 0-1,C 0.2-0.3,B 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	82 - 97	7439-89-6
Cr	1 - 4	7440-47-3
Mo	0 - 4	7439-98-7
W	0 - 4	7440-33-7
Ni	0.1 - 2	7440-02-0
Mn	0.2 - 1.5	7439-96-5
Si	0.4 - 1.2	7440-21-3
Nb	0 - 1	7440-03-1
Ti	0 - 1	7440-32-6
V	0 - 1	7440-62-2
C	0.2 - 0.3	7440-44-0
B	0 - 0.2	7440-42-8

IPCI C22C0038-00 [I]; C21D0009-00 [I]; C22C0038-54 [I]
IPCR C22C0038-00 [I]; C21D0009-00 [I]; C22C0038-54 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon boron seamless steel piercer plug
IT 2315454-12-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(piercer plug made of seamless steel, and its manufg. method)

L13 ANSWER 15 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:807393 CAPLUS Full-text
DOCUMENT NUMBER: 170:538936
TITLE: Manufacture of steel components having a metal coating protecting it against corrosion
INVENTOR(S): Banik, Janko; Koeyer, Maria; Rosenstock, Dirk; Ruthenberg, Manuela
PATENT ASSIGNEE(S): Thyssenkrupp Steel Europe AG, Germany; Thyssenkrupp AG
SOURCE: PCT Int. Appl., 26pp.; Chemical Indexing Equivalent to 170:538935 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019076720	A1	20190425	WO 2018-EP77692	20181011
DE 102017218704	A1	20190425	DE 2017-102017218704	20171019
CN 110997951	A	20200410	CN 2018-80049166	20181011
EP 3697936	A1	20200826	EP 2018-804228	20181011
US 20200216925	A1	20200709	US 2020-16647894	20200317

PRIORITY APPLN. INFO.: DE 2017-102017218704 A 20171019
WO 2018-EP77692 W 20181011
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A method for producing a steel component comprising a steel substrate and an aluminum alloy-based anti-corrosion coating, is described for use in the automotive sector.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
BANIK JANKO	2016			EP 2993248 A1	CAPLUS
COBO SEBASTIAN	2017			US 20170253941 A1	
KUSUMI K	2007			EP 1767286 A1	CAPLUS
MAKI JUN	2014			EP 2695963 A1	CAPLUS
ROSENSTOCK DIRK	2018			WO 2018234102 A1	CAPLUS

IT 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)
RN 2307271-66-3 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0

IPCI C21D0001-76 [I]; B21D0022-02 [I]; B21D0022-20 [I]; C21D0007-13 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-28 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C21D0001-673 [I]
IPCR C21D0001-76 [I]; B21D0022-02 [I]; B21D0022-20 [I]; C21D0001-673 [I]; C21D0007-13 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-28 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel metal prevention corrosion coating
IT Automobile bodies
(chassis; manuf. of steel components having a metal coating protecting it against corrosion)
IT Anticorrosive coating materials
Automobile bodies
Automotive bumpers
(manuf. of steel components having a metal coating protecting it against corrosion)
IT 1273096-81-3P, Aluminum alloy 2307271-67-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anti-corrosion coatings; manuf. of steel components having a metal coating protecting it against corrosion)
IT 1333-74-0, Hydrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in steel; manuf. of steel components having a metal coating protecting it against corrosion)
IT 12597-69-2P, Steel, preparation 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)

L13 ANSWER 16 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:805627 CAPLUS Full-text
DOCUMENT NUMBER: 170:527030
TITLE: Enamelling of high-strength steels
INVENTOR(S): Myslowicki, Stefan
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany; ThyssenKrupp AG
SOURCE: PCT Int. Appl., 28pp.; Chemical Indexing Equivalent to 170:527029 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2019076717	A1	20190425	WO 2018-EP77686	20181011
DE 102017218434	A1	20190418	DE 2017-102017218434	20171016
EP 3697545	A1	20200826	EP 2018-786281	20181011
PRIORITY APPLN. INFO.:			DE 2017-102017218434 A	20171016
			WO 2018-EP77686 W	20181011

AB A shaped part having at least two layers, comprises at least one layer

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

made of high-strength steel with a tensile strength ≥500 MPa and a hardness ≥160 HV, and at least one layer made of a steel that has an enamel layer on the outer side. The shaped part are suitable for producing pipelines, pressure vessels, reactors or in app. engineering, in particular for the transport of aq. and/or corrosive media.

IT 2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)

RN 2306234-82-0 CAPLUS

CN Iron alloy, base, Fe 85-99,Mn 0.5-3,Al 0-3,Si 0.1-2.5,P 0-1.5,Cr 0-1,Mo 0-1,V 0-1,Ti 0-0.8,Nb 0-0.5,C 0-0.4,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	85	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Al	0	-	3	7429-90-5
Si	0.1	-	2.5	7440-21-3
P	0	-	1.5	7723-14-0
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
Ti	0	-	0.8	7440-32-6
Nb	0	-	0.5	7440-03-1
C	0	-	0.4	7440-44-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B21B0001-38 [I]; C21D0008-02 [I]; C21D0009-46 [I]; C22C0038-02 [I]; C23D0005-00 [I]

IPCR B21B0001-38 [I]; C21D0008-02 [I]; C21D0009-46 [I]; C22C0038-02 [I]; C23D0005-00 [I]

CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 57

ST enamel strength steel bilayer

IT Enameling
Enamels (vitreous)
Pipelines
Pressure vessels
Reactors
(enamelling of high-strength steels)

IT 2306234-83-1P, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enameled; enamelling of high-strength steels)

IT 12597-69-2P, Steel, preparation 59816-66-9P, preparation
2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)

L13 ANSWER 17 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2019:802752 CAPLUS Full-text

DOCUMENT NUMBER: 170:538935

TITLE: Manufacture of steel components having a metal coating protecting it against corrosion

INVENTOR(S): Banik, Janko; Koeyer, Maria; Rosenstock, Dirk; Ruthenberg, Manuela

PATENT ASSIGNEE(S): Thyssenkrupp AG, Germany; Thyssenkrupp Steel Europe AG

SOURCE: Ger. Offen., 17pp.; Chemical Indexing Equivalent to 170:538936 (WO)
CODEN: GWXXBX

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017218704	A1	20190425	DE 2017-102017218704	20171019

WO 2019076720	A1	20190425	WO 2018-EP77692		20181011
CN 110997951	A	20200410	CN 2018-80049166		20181011
EP 3697936	A1	20200826	EP 2018-804228		20181011
US 20200216925	A1	20200709	US 2020-16647894		20200317
PRIORITY APPLN. INFO.:			DE 2017-102017218704	A	20171019
			WO 2018-EP77692	W	20181011

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A method for producing a steel component comprising a steel substrate and an aluminum alloy-based anti-corrosion coating, is described for use in the automotive sector.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				EP 1767286 A1	CAPLUS
Anon				US 20120085467 A1	CAPLUS
Anon				EP 2377965 A2	CAPLUS
Anon				EP 2993248 A1	CAPLUS

IT 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)

RN 2307271-66-3 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.1	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0

IPCI C22C0038-04 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C21D0001-673 [I]
IPCR C22C0038-04 [I]; C21D0001-673 [I]; C23C0002-12 [I]; C23C0002-26 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel metal prevention corrosion coating
IT Automobile bodies
(chassis; manuf. of steel components having a metal coating protecting it against corrosion)
IT Anticorrosive coating materials
Automobile bodies
Automotive bumpers
(manuf. of steel components having a metal coating protecting it against corrosion)
IT 1273096-81-3P, Aluminum alloy 2307271-67-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anti-corrosion coatings; manuf. of steel components having a metal coating protecting it against corrosion)
IT 1333-74-0, Hydrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in steel; manuf. of steel components having a metal coating protecting it against corrosion)
IT 12597-69-2P, Steel, preparation 2307271-66-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; manuf. of steel components having a metal coating protecting it against corrosion)

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

ACCESSION NUMBER: 2019:746016 CAPLUS Full-text
DOCUMENT NUMBER: 170:527029
TITLE: Enamelling of high-strength steels
INVENTOR(S): Myslowicki, Stefan
PATENT ASSIGNEE(S): ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE: Ger. Offen., 20pp.; Chemical Indexing Equivalent to 170:527030 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102017218434	A1	20190418	DE 2017-102017218434	20171016
WO 2019076717	A1	20190425	WO 2018-EP77686	20181011
EP 3697545	A1	20200826	EP 2018-786281	20181011
PRIORITY APPLN. INFO.:			DE 2017-102017218434 A	20171016
			WO 2018-EP77686 W	20181011

AB A shaped part having at least two layers, comprises at least one layer made of high-strength steel with a tensile strength ≥500 MPa and a hardness ≥160 HV, and at least one layer made of a steel that has an enamel layer on the outer side. The shaped part are suitable for producing pipelines, pressure vessels, reactors or in app. engineering, in particular for the transport of aq. and/or corrosive media.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 102008022709 A1	CAPLUS
Anon				DE 1533303 C2	
Anon				EP 2227574 B1	CAPLUS

IT 2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)
RN 2306234-82-0 CAPLUS
CN Iron alloy, base, Fe 85-99,Mn 0.5-3,Al 0-3,Si 0.1-2.5,P 0-1.5,Cr 0-1,Mo 0-1,V 0-1,Ti 0-0.8,Nb 0-0.5,C 0-0.4,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	85 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Al	0 - 3	7429-90-5
Si	0.1 - 2.5	7440-21-3
P	0 - 1.5	7723-14-0
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
V	0 - 1	7440-62-2
Ti	0 - 0.8	7440-32-6
Nb	0 - 0.5	7440-03-1
C	0 - 0.4	7440-44-0
B	0 - 0.1	7440-42-8
S	0 - 0.1	7704-34-9

IPCI C23D0005-00 [I]; B23K0020-04 [I]
IPCR C23D0005-00 [I]; B23K0020-04 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 57
ST enamel strength steel bilayer
IT Enameling
Enamels (vitreous)
Pipelines
Pressure vessels
Reactors
(enamelling of high-strength steels)
IT 2306234-83-1P, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enameled; enamelling of high-strength steels)

IT 12597-69-2P, Steel, preparation 59816-66-9P, preparation
2306234-82-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(enamelling of high-strength steels)

L13 ANSWER 19 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:570060 CAPLUS Full-text
DOCUMENT NUMBER: 170:493791
TITLE: Method for manufacturing hot stamped parts with aluminum-silicon alloy coating and hot stamped parts
INVENTOR(S): Tan, Ning; Fu, Jiang; Hong, Jiyao; Fang, Xuehua
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 13pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109518114	A	20190326	CN 2018-11035118	20180906
WO 2020030200	A1	20200213	WO 2019-CN104708	20190906
EP 3770295	A1	20210127	EP 2019-847997	20190906
PRIORITY APPLN. INFO.:			CN 2018-10896744 A	20180808
			CN 2018-11035118 A	20180906
			WO 2019-CN104708 W	20190906

AB The title method comprises the following steps of: processing steel plate coated with aluminum-silicon alloy coating to form a blank of a desired shape of the part, heat treating the blank, and hot stamping. The blank heat treatment adopts two-stage or three-stage heating and heat preservation, and the heating and heat preservation are stepwise heating. The steel plate coated with aluminum-silicon alloy coating include a substrate and an aluminum-silicon alloy coating on at least one surface thereof. The method fully considers the characteristics of the aluminum-silicon coating, is able to effectively solve the problem of roll banding of the aluminum-silicon coating, reduces the nodulation probability of the roller of the heat treatment furnace, improves the service life of the roller, and ensures the integrity of the coating of the hot stamped part as well as the mech. property, welding property, coating property and corrosion resisting property of the part.
IT 2305367-85-3P, Aluminum 0-0.3, boron 0-0.1, carbon 0.04-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1.2, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)
RN 2305367-85-3 CAPLUS
CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1.2,C 0-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1.2	7440-21-3
C	0	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI C23C0002-12; C23C0002-40; C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-28; C22C0038-32; C22C0038-38; C21D0001-26; C21D0008-00; B21D0022-02
IPCR C23C0002-12 [I]; B21D0022-02 [I]; C21D0001-26 [I]; C21D0008-00 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-28 [I];

C22C0038-32 [I]; C22C0038-38 [I]; C23C0002-40 [I]
CC 56-11 (Nonferrous Metals and Alloys)
ST hot stamping steel aluminum silicon coating
IT Cooling
Heat treatment
(method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)
IT Metalworking
(stamping; method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)
IT 2305367-85-3P, Aluminum 0-0.3, boron 0-0.1, carbon 0.04-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1.2, sulfur 0-0.1, titanium 0-0.5, iron bal. 2305367-88-6P, Iron 0-4, silicon 4-14, aluminum bal.
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for manufg. hot stamped parts with aluminum-silicon alloy coating and hot stamped parts)

L13 ANSWER 20 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2019:340815 CAPLUS Full-text
DOCUMENT NUMBER: 170:379972
TITLE: Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance
INVENTOR(S): Bi, Wenzhen; Hong, Jiyao; Wang, Li
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 7pp.; Chemical Indexing Equivalent to 173:85818 (WO)
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 109365606	A	20190222	CN 2018-11453322	20181130
WO 2020108593	A1	20200604	WO 2019-CN121859	20191129

PRIORITY APPLN. INFO.: CN 2018-11453322 A 20181130
AB The invention discloses a hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance, which improves the corrosion resistance of the steel plate or the steel strip and avoids cracking of the substrate. The above steel plate or steel strip includes the following components in percentage by wt.: C 0.1-0.8%, Si 0.05-2.0%, Mn 0.5-3.0%, P <0.1%, S <0.05%, Al <0.1%, N <0.01%, and balance of Fe and impurities, and also includes at least one of Cr 0.01-1.0%, Mo 0.01-1.0%, Ti <0.2%, Nb 0.01-0.08%, V 0.01-1.0%, and B 0.005-0.08%; the zinc-based coating includes the following components in percentage by wt.: Al 0.15%-6.5%, Mg 0.2-7%, RE <0.2%, Sr 0.002-0.2%, and balance of Zn and impurities, and the coating further includes at least one or more of Mn, Cr, Al, and Mg, and the total amt. thereof is more than 0.1%.
IT 2293976-55-1, Aluminum 0-0.1, boron 0.005-0.1, carbon 0.1-0.8, chromium 0.01-1, iron bal., manganese 0.5-3, molybdenum 0.01-1, niobium 0.01-0.1, phosphorus 0-0.1, silicon 0.05-2, titanium 0-0.2, vanadium 0.01-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel plate or steel strip with excellent corrosion resistance)
RN 2293976-55-1 CAPLUS
CN Iron alloy, base, Fe 91-99,Mn 0.5-3,Si 0-2,Cr 0-1,Mo 0-1,V 0-1,C 0.1-0.8,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3

Mo	0	-	1	7439-98-7
V	0	-	1	7440-62-2
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0

IPCI B21D0022-02; C23C0002-06; C23C0002-40; C22C0018-00; C21D0008-02
IPCR B21D0022-02 [I]; C21D0008-02 [I]; C22C0018-00 [I]; C23C0002-06 [I];
C23C0002-40 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST corrosion resistance zinc alloy coating steel hot stamping
IT Anticorrosive coating materials
(Hot stamping method of zinc-based coated steel
plate or steel strip with excellent corrosion resistance)
IT Metalworking
(stamping, hot; Hot stamping method of zinc-based coated
steel plate or steel strip with excellent corrosion
resistance)
IT 2293976-55-1, Aluminum 0-0.1, boron 0.005-0.1, carbon 0.1-0.8,
chromium 0.01-1, iron bal., manganese 0.5-3, molybdenum 0.01-1, niobium
0.01-0.1, phosphorus 0-0.1, silicon 0.05-2, titanium 0-0.2, vanadium
0.01-1
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process);
TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel
plate or steel strip with excellent corrosion resistance)
IT 2226545-76-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(Hot stamping method of zinc-based coated steel
plate or steel strip with excellent corrosion resistance)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
(1 CITINGS)

L13 ANSWER 21 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2601319 CAPLUS Full-text
DOCUMENT NUMBER: 170:116258
TITLE: Method for producing a steel automotive component
provided with an aluminum alloy anti-corrosion coating
INVENTOR(S): Rosenstock, Dirk; Banik, Janko
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany; ThyssenKrupp AG
SOURCE: PCT Int. Appl., 25pp.; Chemical Indexing Equivalent to
170:116256 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018234102	A1	20181227	WO 2018-EP65498	20180612
DE 102017210201	A1	20181220	DE 2017-102017210201	20170619
EP 3642371	A1	20200429	EP 2018-738199	20180612
PRIORITY APPLN. INFO.:			DE 2017-102017210201 A	20170619
			WO 2018-EP65498 W	20180612

AB A method is described for producing a corrosion-resistant steel
automotive component comprising a substrate and an anticorrosive coating.
IT 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component
provided with an aluminum alloy anti-corrosion coating)
RN 2254829-63-3 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti
0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

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=========+=============+===============
    Fe     94    -  99         7439-89-6
    Mn      0.5 -    3         7439-96-5
    Cr      0   -    1         7440-47-3
    C       0.2 -    0.5       7440-44-0
    Si      0.1 -    0.5       7440-21-3
    Ti      0   -    0.2       7440-32-6
    Al      0   -    0.1       7429-90-5
    B       0   -    0.1       7440-42-8
    Nb      0   -    0.1       7440-03-1
    P       0   -    0.1       7723-14-0

IPCI C21D0008-02 [I]; C23C0002-12 [I]; C21D0009-46 [I]; C21D0001-673 [I];
     B32B0015-01 [I]
IPCR C21D0008-02 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0009-46 [I];
     C23C0002-12 [I]
CC   55-10 (Ferrous Metals and Alloys)
     Section cross-reference(s): 56
ST   steel automobile metal coating corrosion aluminum alloy
IT   Anticorrosive coating materials
        (metallic; method for producing a steel automotive component
        provided with an aluminum alloy anti-corrosion coating)
IT   Automobile bodies
     Automobile doors
     Automobile roofs
     Automotive bumpers
     Heat treatment
        (method for producing a steel automotive component provided
        with an aluminum alloy anti-corrosion coating)
IT   254455-65-7P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (coatings; method for producing a steel automotive
        component provided with an aluminum alloy anti-corrosion
        coating)
IT   870820-47-6P, 22MnB5   2254829-63-3P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (strips; method for producing a steel automotive component
        provided with an aluminum alloy anti-corrosion coating)
OS.CITING REF COUNT:     1     THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
                               (1 CITINGS)


L13  ANSWER 22 OF 103  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:         2018:2544202  CAPLUS Full-text
DOCUMENT NUMBER:          170:116256
TITLE:                    Method for producing a steel automotive component
                          provided with an aluminum alloy anti-corrosion coating
INVENTOR(S):              Rosenstock, Dirk; Banik, Janko
PATENT ASSIGNEE(S):       ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE:                   Ger. Offen., 16pp.; Chemical Indexing Equivalent to
                          170:116258 (WO)
                          CODEN: GWXXBX
DOCUMENT TYPE:            Patent
LANGUAGE:                 German
FAMILY ACC. NUM. COUNT:   2
PATENT INFORMATION:
     PATENT NO.           KIND  DATE        APPLICATION NO.          DATE
     ---------------      ----  --------    ----------------------   --------
     DE 102017210201       A1   20181220    DE 2017-102017210201     20170619
     CN 109136775          A    20190104    CN 2017-10986828         20171020
     WO 2018234102         A1   20181227    WO 2018-EP65498          20180612
     EP 3642371            A1   20200429    EP 2018-738199           20180612
PRIORITY APPLN. INFO.:                      DE 2017-102017210201 A   20170619
                                            WO 2018-EP65498      W   20180612
AB   A method is described for producing a corrosion-resistant steel
     automotive component comprising a substrate and an anticorrosive coating.
RETABLE
   Referenced Author    |Year | VOL | PG   | Referenced Work    | Referenced
         (RAU)          |(RPY)|(RVL)|(RPG) |      (RWK)         | File
========================+=====+=====+======+====================+==========
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Anon | | | |DE 102007061489 A1 |CAPLUS
Anon | | | |DE 102009007909 A1 |CAPLUS
Anon | | | |WO 2015036151 A1 |CAPLUS
Anon | | | |WO 2016034476 A1 |CAPLUS

IT 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)

RN 2254829-63-3 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0

IPCI C22C0038-04 [I]; C21D0008-02 [I]; C23C0002-12 [I]
IPCR C22C0038-04 [I]; C21D0008-02 [I]; C23C0002-12 [I]
CC 55-10 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST steel automobile metal coating corrosion aluminum alloy
IT Anticorrosive coating materials
(metallic; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT Automobile bodies
Automobile doors
Automobile roofs
Automotive bumpers
Heat treatment
(method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 254455-65-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coatings; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
IT 870820-47-6P, 22MnB5 2254829-63-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; method for producing a steel automotive component provided with an aluminum alloy anti-corrosion coating)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 23 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:2321302 CAPLUS Full-text
DOCUMENT NUMBER: 170:49880
TITLE: Steel-based electromagnetic shield multilayer screen products
INVENTOR(S): Wieschalla, Vanessa; Nierhoff, Daniel; Wolske, Vanessa; Becker, Jens-Ulrik
PATENT ASSIGNEE(S): ThyssenKrupp AG, Germany; ThyssenKrupp Steel Europe AG
SOURCE: Ger., 17pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

DE 102017216975	B3	20181129	DE 2017-102017216975	20170925
WO 2019057547	A1	20190328	WO 2018-EP74424	20180911

PRIORITY APPLN. INFO.: DE 2017-102017216975 A 20170925

AB An electromagnetic radiation shielding multilayer material is manufd. for shielding from electromagnetic radiation, static elec. and/or static magnetic fields.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				EP 1426982 A1	CAPLUS
Anon				WO 1991012960 A1	
Anon				DE 3710322 A1	CAPLUS

IT 2253656-70-9P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(layers; steel-based electromagnetic shield multilayer screen products)

RN 2253656-70-9 CAPLUS

CN Iron alloy, base, Fe 94-100,Mn 0.1-3,C 0-0.5,Cr 0-0.5,Cu 0-0.5,Si 0-0.5,Ti 0-0.3,Ni 0-0.2,Al 0-0.1,As 0-0.1,B 0-0.1,Mo 0-0.1,N 0-0.1,Nb 0-0.1,P 0-0.1,S 0-0.1,Sn 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 100	7439-89-6
Mn	0.1 - 3	7439-96-5
C	0 - 0.5	7440-44-0
Cr	0 - 0.5	7440-47-3
Cu	0 - 0.5	7440-50-8
Si	0 - 0.5	7440-21-3
Ti	0 - 0.3	7440-32-6
Ni	0 - 0.2	7440-02-0
Al	0 - 0.1	7429-90-5
As	0 - 0.1	7440-38-2
B	0 - 0.1	7440-42-8
Mo	0 - 0.1	7439-98-7
N	0 - 0.1	17778-88-0
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0
S	0 - 0.1	7704-34-9
Sn	0 - 0.1	7440-31-5
V	0 - 0.1	7440-62-2

IPCI C22C0038-02 [I]; H05K0009-00 [I]; C22C0038-04 [I]; C22C0038-18 [I]
IPCR C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-18 [I]; H05K0009-00 [I]
CC 55-3 (Ferrous Metals and Alloys)
Section cross-reference(s): 73, 76, 77
ST multilayer screen electromagnetic shield stainless steel alloy
IT Electromagnetic shields
Hot rolling
Multilayers
(steel-based electromagnetic shield multilayer screen products)
IT 2253656-70-9P 2253656-71-0P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(layers; steel-based electromagnetic shield multilayer screen products)

L13 ANSWER 24 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1950769 CAPLUS Full-text
DOCUMENT NUMBER: 169:495369
TITLE: Microstructural features and corrosion analysis of A517 steel joint processed by friction stir welding
AUTHOR(S): Ansaripour, Morteza; Soltanipour, Abdol Reza; Dehnavi, Mohamad Reza
CORPORATE SOURCE: Materials Engineering Department, Malek Ashtar University of Technology, Shahin Shahr, Iran

SOURCE: Materials Research Express (2018), 5(6), 066543/1-066543/13
CODEN: MREAC3; ISSN: 2053-1591
DIGITAL OBJECT ID: 10.1088/2053-1591/aacc80
PUBLISHER: IOP Publishing Ltd.
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English

AB Microstructural observations of friction stir welds of A517 (B) steel showed that within the range of welding variables, martensite phase was hindered. Stir zone microstructure displayed coarse-grained upper bainite assocd. with granular bainite. HAZ consisted of decompd. bainite morphol. of lath-like and equiaxed. Electron backscatter diffraction anal. showed a random oriented recrystd. grain. The corrosion behavior in 3.5 wt% NaCl soln. revealed neg. shift of corrosion potential with increasing of traverse speed. However, the effect of welding parameters on cathodic behavior was more predominant than that on anodic behavior; assocd. with the microstructural alterations. Pitting of corrosion rust layer was identified as the main mechanism of corrosion attack in base material and welds. Although, corrosion c.d. of weld in all of the applied welding condition was slightly lower than that in the base material, however, this study provides recommendation for application of A517 steel jointed by friction stir welding in marine environment.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bhadeshia, H	1999	A273-	58	Mater Sci Eng	CAPLUS
Casalino, G	2012		8239	Proc of SPIE-The Int	
Casalino, G	2014		8963	Proc of SPIE-The Int	
Chen, Y	2005	398	47	Mater Sci Eng A	
Choi, Y	2005	391	162	J Alloys Compd	CAPLUS
Cui, H	2016	681	426	J of Alloys and Comp	CAPLUS
Gao, K	2010	52	3428	Corros Sci	CAPLUS
Ghosh, M	2013	22	3890	J Mater Eng Perform	CAPLUS
Huang, H	1994	36	1027	Corros Sci	CAPLUS
Lee, W	2004	58	1041	Mater Lett	CAPLUS
Li, L	2012	7	3773	Int J Electrochem Sc	CAPLUS
Lu, B	2009	57	41	Acta Mater	CAPLUS
Manvatkar, V	2015	94	36	Scr Mater	CAPLUS
Medina, G	2016	21	146	Soldagem & Inspecao	
Meshram, S	2017	25	94	Journal of Manufactu	
Mishra, R	2005	50	1	Mater Sci Eng R	
Nelson, T	2016	231	66	Mater Process Techno	CAPLUS
Park, H	2004	371A	160	Mater Sci Eng	
Paul, C	2015	10	10246	Int J Electrochem Sc	
Ramirez, A	2013		75	Proc of the 1st Int	
Ren, R	2012	85	283	Electrochemica Acta	CAPLUS
Sato, Y	2005	53	637	Acta Mater	CAPLUS
Sato, Y	2001	32A	3033	Metall Mater Trans	CAPLUS
Sherif, E	2015	10	34	Int J Electrochem Sc	CAPLUS
Sherif, E	2011	129	961	Mater Chem Phy	CAPLUS
Sutton, M	2003	70	2215	Eng Fract Mech	
Sutton, M	2003	354A	6	Mater Sci Eng	
Wang, H	2015	10	5827	Int J Electrochem Sc	CAPLUS
Wang, X	2014	9	4574	Int J Electrochem Sc	
Wang, X	2014	21	474	J Nat Gas Sci Eng	CAPLUS
Wert, J	2003	49	607	Scr Mater	CAPLUS
Yan, J	2005	10	725	Sci Tech Weld Joinin	CAPLUS
Zajac, S	2005		387	Proc of the Int Conf	CAPLUS
Zhang, Q	2002	77	603	Mater Chem Phys	
Zhang, R	2010	41A	1448	Metall Mater Trans	CAPLUS
Zhang, S	2013	75	293	Corros Sci	CAPLUS

IT 52346-86-8, A517B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)

RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)
ST steel joint processed friction stir welding microstructural feature corrosion
IT Corrosion
Corrosion resistance
Current density
Electric current-potential relationship
Friction welding
Friction welds
Grain size
Microstructure
Recrystallization
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)
IT 12173-93-2, Martensite, formation (nonpreparative) 12427-23-5, Bainite
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)
IT 52346-86-8, A517B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microstructural features and corrosion anal. of A517 steel joint processed by friction stir welding)

L13 ANSWER 25 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1916470 CAPLUS Full-text
DOCUMENT NUMBER: 169:454845
TITLE: Aluminum alloy plated electric resistance welded pipe for quenching and method of manufacturing aluminum plated hollow member
INVENTOR(S): Maki, Jun; Fujita, Soshi; Nakamura, Toyomitsu
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Tokkyo Koho, 23pp.
CODEN: JTXXFF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 6406475	B1	20181017	JP 2018-513042		20171120
WO 2019097729	A1	20190523	WO 2017-JP41697		20171120
CN 111247266	A	20200605	CN 2017-80096110		20171120
IN 202017014250	A	20200814	IN 2020-17014250		20200331
US 20200347489	A1	20201105	US 2020-16753961		20200406
PRIORITY APPLN. INFO.:			WO 2017-JP41697	W	20171120

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The aluminum alloy plated elec. resistance welded pipe for quenching comprises a base material made of tubular steel plate and an elec. resistance welded part provided in abutting part of steel plate and extending in longitudinal direction. The base material comprises in mass%: carbon 0.06-0.5, silicon 0.01-0.8, manganese 0.6-3, phosphorous 0-0.05, sulfur 0-0.05, aluminum 0-0.1, oxygen 0-0.006, nitrogen 0-0.02, titanium 0.01-0.1, boron 0-0.1, niobium 0-0.1, vanadium 0-0.3, chromium 0-0.5, molybdenum 0-0.5, nickel 0-0.5, copper 0-0.5, calcium 0-0.005, rare earth metal 0-0.005, iron balance and impurities. The base material is positioned on the surface of steel sheet and has an intermetallic compd. layer contg. an aluminum-iron-silicon based intermetallic compd. and an

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Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

aluminum plating layer located on the surface of the intermetallic compd. layer and contg. aluminum and silicon. The thickness of intermetallic compd. layer is X (μm), the thickness of aluminum layer is Y (μm), and when the thickness of steel pipe is t (mm) and outer diam. of steel pipe is D (mm), the following formula is satisfied: 70 × X/D ≤ Y/t ≤ 30. The method of manufg. aluminum plated hollow member comprises: positioning the base material on the surface of steel sheet, heating aluminum-plated elec. resistance welded pipe, forming the heated aluminum-plated elec. resistance welded pipe into desired shape, and rapidly cooling the aluminum plating elec. resistance welded pipe. According to the present invention, it is possible to manuf. high strength aluminum plated hollow member by hot working, and it is possible to obtain part that has reduced wt.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1983			JP 58204179 A	CAPLUS
Anon	2008			JP 2008069398 A	CAPLUS
Anon	2009			WO 2009131233 A1	CAPLUS
Anon	2014			JP 2014118628 A	CAPLUS
Anon	2017			JP 2017026147 A	CAPLUS

IT 2247299-93-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum alloy plated elec. resistance welded pipe for quenching and method of manufg. aluminum plated hollow member)
RN 2247299-93-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.6-3,Si 0-0.8,C 0.1-0.5,Cr 0-0.5,Cu 0-0.5,Mo 0-0.5,Ni 0-0.5,V 0-0.3,Al 0-0.1,B 0-0.1,Nb 0-0.1,Ti 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.6	-	3	7439-96-5
Si	0	-	0.8	7440-21-3
C	0.1	-	0.5	7440-44-0
Cr	0	-	0.5	7440-47-3
Cu	0	-	0.5	7440-50-8
Mo	0	-	0.5	7439-98-7
Ni	0	-	0.5	7440-02-0
V	0	-	0.3	7440-62-2
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
Ti	0	-	0.1	7440-32-6

IPCI C23C0002-28 [I]; C23C0002-12 [I]; C23C0002-40 [I]; C23C0002-26 [I]; C23C0028-00 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-08 [N]; C21D0001-18 [N]; C21D0009-50 [N]; C22C0021-00 [N]
IPCR C23C0002-28 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C23C0002-12 [I]; C23C0002-26 [I]; C23C0002-40 [I]; C23C0028-00 [I]
CC 56-6 (Nonferrous Metals and Alloys)
IT 2247299-93-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum alloy plated elec. resistance welded pipe for quenching and method of manufg. aluminum plated hollow member)

L13 ANSWER 26 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1651585 CAPLUS Full-text
DOCUMENT NUMBER: 169:330484
TITLE: Method for producing a hot-formed coated steel product
INVENTOR(S): Beentjes, Petrus Cornelis Jozef; Van Schoonevelt, Hugo
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: PCT Int. Appl., 28pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2018158166	A1	20180907	WO 2018-EP54600		20180223
CA 3051002	A1	20180907	CA 2018-3051002		20180223
MX 2019010192	A	20191002	MX 2019-10192		20180223
CN 110352260	A	20191018	CN 2018-80014405		20180223
KR 2019124211	A	20191104	KR 2019-7023413		20180223
EP 3589772	A1	20200108	EP 2018-714700		20180223
JP 2020510755	T	20200409	JP 2019-546825		20180223
BR 112019015673	A2	20200707	BR 2019-112019015673		20180223
US 20200165712	A1	20200528	US 2019-16485606		20190813
IN 201947037974	A	20190927	IN 2019-47037974		20190920
PRIORITY APPLN. INFO.:			EP 2017-158418	A	20170228
			EP 2017-158419	A	20170228
			WO 2018-EP54600	W	20180223

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention relates to an Al-Si-alloy coated steel strip for hot press forming and to a method for producing the Al-Si-alloy coated steel strip in a continuous coating process.

IT 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)

RN 2243499-83-2 CAPLUS

CN Iron alloy, base, Fe 79-100,Mn 0.4-4,Cr 0-4,Al 0-3,Si 0-3,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.5,V 0-0.5,W 0-0.5,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	79	-	100	7439-89-6
Mn	0.4	-	4	7439-96-5
Cr	0	-	4	7440-47-3
Al	0	-	3	7429-90-5
Si	0	-	3	7440-21-3
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Mo	0	-	1	7439-98-7
C	0	-	0.5	7440-44-0
V	0	-	0.5	7440-62-2
W	0	-	0.5	7440-33-7
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
IPCR C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
CC 56-7 (Nonferrous Metals and Alloys)
ST hot formed aluminum silicon alloy coated steel product prodn
IT Paints
(adhesion; method for producing hot-formed coated steel product)
IT Heating
(convective, prediffusion annealing; method for producing hot-formed coated steel product)
IT Aluminizing
(hot dip; method for producing hot-formed coated steel product)
IT Hot-dip coating process
(hot-dip aluminizing; method for producing hot-formed coated steel product)
IT Metal forming
(hot; method for producing hot-formed coated steel product)

IT Automobile bodies
Cooling
Cutting
Diffusion coating materials
Immersion coating process
Phase composition
Surface structure
Thickness
(method for producing hot-formed coated steel product)
IT Adhesion, physical
(paint; method for producing hot-formed coated steel product)
IT Induction heating
Radiant heating
(prediffusion annealing; method for producing hot-formed coated steel product)
IT Annealing
(prediffusion; method for producing hot-formed coated steel product)
IT 12004-62-5 12043-58-2 596799-27-8, Aluminum iron silicide (Al2Fe2Si)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(method for producing hot-formed coated steel product)
IT 7440-70-2D, Calcium, trace in steel 7704-34-9D, Sulfur, trace in steel 7727-37-9D, Nitrogen, trace in steel
7782-44-7D, Oxygen, trace in steel
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(method for producing hot-formed coated steel product)
IT 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)
IT 12597-69-2, Steel, processes 2243499-81-0, Aluminum 96-100, silicon 0.4-4
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing hot-formed coated steel product)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 27 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:1651584 CAPLUS Full-text
DOCUMENT NUMBER: 169:330483
TITLE: Method for producing a steel strip with an aluminum alloy coating layer
INVENTOR(S): Hensen, Guido Cornelis
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: PCT Int. Appl., 29pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018158165	A1	20180907	WO 2018-EP54599	20180223
CA 3051515	A1	20180907	CA 2018-3051515	20180223
CN 110352259	A	20191018	CN 2018-80014404	20180223
KR 2019124210	A	20191104	KR 2019-7023412	20180223
EP 3589771	A1	20200108	EP 2018-714699	20180223
BR 112019015695	A2	20200407	BR 2019-112019015695	20180223
JP 2020510756	T	20200409	JP 2019-546864	20180223
US 20200017948	A1	20200116	US 2019-16485655	20190813
IN 201947038244	A	20191004	IN 2019-47038244	20190923

PRIORITY APPLN. INFO.: EP 2017-158418 A 20170228
EP 2017-158419 A 20170228
WO 2018-EP54599 W 20180223
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to a method for producing a steel strip with an aluminum alloy coating layer in a continuous coating process. The invention also relates to an steel strip coated with an aluminum alloy coating layer that can be produced in accordance with the method, the use of such a coated steel strip and the product made by using the coated steel strip.
IT 2243499-83-3D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing steel strip with aluminum alloy coating layer)
RN 2243499-83-2 CAPLUS
CN Iron alloy, base, Fe 79-100,Mn 0.4-4,Cr 0-4,Al 0-3,Si 0-3,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.5,V 0-0.5,W 0-0.5,Nb 0-0.3,Ti 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	79 - 100	7439-89-6
Mn	0.4 - 4	7439-96-5
Cr	0 - 4	7440-47-3
Al	0 - 3	7429-90-5
Si	0 - 3	7440-21-3
Cu	0 - 2	7440-50-8
Ni	0 - 2	7440-02-0
Mo	0 - 1	7439-98-7
C	0 - 0.5	7440-44-0
V	0 - 0.5	7440-62-2
W	0 - 0.5	7440-33-7
Nb	0 - 0.3	7440-03-1
Ti	0 - 0.3	7440-32-6
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

IPCI C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
IPCR C23C0002-12 [I]; C23C0002-28 [I]; C23C0002-40 [I]
CC 56-7 (Nonferrous Metals and Alloys)
ST aluminum alloy coated steel strip hot dip prodn method
IT Recrystallization
(annealing, before hot dipping; method for producing steel strip with aluminum alloy coating layer)
IT Induction heating
Radiant heating
(annealing; method for producing steel strip with aluminum alloy coating layer)
IT Annealing
(diffusion; method for producing steel strip with aluminum alloy coating layer)
IT Aluminizing
(hot dip, continuous; method for producing steel strip with aluminum alloy coating layer)
IT Hot-dip coating process
(hot-dip aluminizing, continuous; method for producing steel strip with aluminum alloy coating layer)
IT Metal forming
(hot; method for producing steel strip with aluminum alloy coating layer)
IT Automobile bodies
Cooling
Cutting
Diffusion coating materials
Electric heating
Phase composition
Temperature

Thickness
(method for producing steel strip with aluminum alloy coating layer)
IT Crack propagation
(resistance; method for producing steel strip with aluminum alloy coating layer)
IT Wetting
(time; method for producing steel strip with aluminum alloy coating layer)
IT 12004-62-5 12043-58-2 596799-27-8, Aluminum iron silicide (Al2Fe2Si)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(method for producing steel strip with aluminum alloy coating layer)
IT 7440-70-2D, Calcium, trace in steel 7704-34-9D, Sulfur, trace in steel 7727-37-9D, Nitrogen, trace in steel 7782-44-7D, Oxygen, trace in steel
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(method for producing steel strip with aluminum alloy coating layer)
IT 12597-69-2, Steel, processes 2243499-81-0, Aluminum 96-100, silicon 0.4-4 2243499-83-2D, Aluminum 0-3, boron 0-0.1, carbon 0-0.5, chromium 0-4, copper 0-2, manganese 0.4-4, molybdenum 0-1, nickel 0-2, niobium 0-0.3, phosphorus 0-0.1, silicon 0-3, titanium 0-0.3, tungsten 0-0.5, vanadium 0-0.5, iron bal., S 0-0.05, N 0.001-0.03, Ca 0-0.05, O 0-0.008 2243499-84-3, Aluminum 97, iron 2.3, silicon 0.9 2243499-85-4, Aluminum 96, iron 2.3, silicon 1.9 2243499-86-5, Aluminum 96, iron 2.8, silicon 0.9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for producing steel strip with aluminum alloy coating layer)
IT 2243499-82-1P, Aluminum 50-55, iron 43-48, silicon 0.4-4
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for producing steel strip with aluminum alloy coating layer)

L13 ANSWER 28 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:863056 CAPLUS Full-text
DOCUMENT NUMBER: 168:486049
TITLE: Steel welding part with aluminum or aluminum alloy plating layer and manufacture method thereof
INVENTOR(S): Pan, Hua; Su, Yongchao; Lei, Ming; Shi, Lei; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: PCT Int. Appl., 17pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018077067	A1	20180503	WO 2017-CN106516	20171017
CN 106334875	A	20170118	CN 2016-10953787	20161027
MX 2019004121	A	20190606	MX 2019-4121	20171017
KR 2019069471	A	20190619	KR 2019-7013481	20171017
EP 3533558	A1	20190904	EP 2017-864438	20171017
JP 2019535894	T	20191212	JP 2019-520992	20171017
US 20200038998	A1	20200206	US 2019-16339215	20190403
IN 201917015151	A	20190719	IN 2019-17015151	20190415
PRIORITY APPLN. INFO.:			CN 2016-10953787 A	20161027
			WO 2017-CN106516 W	20171017

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention discloses a steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof. The steel welding part with aluminum or aluminum alloy plating layer comprises a steel substrate and a plating layer, the plating layer comprises an intermetallic compd. alloy layer in contact with the substrate, and a metal alloy layer thereon; which is characterized in that on at least one of the plated surfaces of the weld blank, the plating layer located

in the area to be welded of the weld blank is completely removed, and the end face of the welding blank part plating layer removed the region to be welded is perpendicular to the surface of the substrate which is parallel to weld seam to form an included angle β, and the included angle β =0-80°. A method of manufg. steel welding part with aluminum or aluminum alloy plating layer is characterized in that it includes the steps of: obtaining weld blank by welding according to the requirements of steel welding part with aluminum or aluminum alloy plating layer, welding the area to be welded of the weld blank where the plating layer has been completely removed to form a welded joint; obtaining a part by hot stamping, selecting a cooling rate which is greater than the crit. transformation speed of the matrix martensite quenching, and cooling. This invention ensures tensile strength, elongation rate and corrosion resistance of welding joint after hot stamping.

IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

RN 2067242-22-0 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	89 - 100	7439-89-6
Mn	0.1 - 5	7439-96-5
Cr	0 - 3	7440-47-3
Si	0 - 1	7440-21-3
C	0.1 - 0.8	7440-44-0
Ti	0 - 0.5	7440-32-6
Al	0 - 0.3	7429-90-5
P	0 - 0.3	7723-14-0
B	0 - 0.1	7440-42-8
S	0 - 0.1	7704-34-9

IPCI B23K0026-32 [I]; C22C0038-04 [I]
IPCR B23K0026-32 [I]; C22C0038-04 [I]
CC 56-9 (Nonferrous Metals and Alloys)
Section cross-reference(s): 47
ST steel laser welding corrosion strength
IT Corrosion resistance
Elongation, mechanical
Laser welding
Plating process
Tensile strength
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT Intermetallic compounds
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
IT 1273096-81-3, Aluminum alloy
RL: TEM (Technical or engineered material use); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)

L13 ANSWER 29 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2018:228290 CAPLUS Full-text
DOCUMENT NUMBER: 168:225095

TITLE: Low-carbon steel sheet and plated steel sheet for automobile parts
INVENTOR(S): Sano, Kohichi; Uno, Makoto; Nishiyama, Ryoichi; Yamaguchi, Yuji; Sugiura, Natsuko; Nakata, Masahiro
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 54pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2018026015	A1	20180208	WO 2017-JP28478	20170804
TW I629367	B	20180711	TW 2017-126478	20170804
JP 6358406	B2	20180718	JP 2017-562089	20170804
KR 2019012262	A	20190208	KR 2019-7000430	20170804
KR 2205432	B1	20210120		
MX 2019000051	A	20190401	MX 2019-51	20170804
CN 109563586	A	20190402	CN 2017-80047871	20170804
BR 112019000422	A2	20190430	BR 2019-112019000422	20170804
EP 3495529	A1	20190612	EP 2017-837116	20170804
US 20190233926	A1	20190801	US 2018-16312222	20181220
US 10889879	B2	20210112		
IN 201817049387	A	20190322	IN 2018-17049387	20181227

PRIORITY APPLN. INFO.: JP 2016-155090 A 20160805
WO 2017-JP28478 W 20170804
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The steel plate has chem. compn. as: aluminum 0.010-0.6, boron 0.0005-0.1, calcium 0.0001-0.05, carbon 0.008-0.15, chromium 0.05-1, copper 0.01-2, iron and impurities balance, magnesium 0.0001-0.05, manganese 0.60-2.5, molybdenum 0.01-1, nickel 0.01-2, niobium 0-0.2, nitrogen 0-0.006, phosphorus 0-0.05, rare earth metal 0.0001-0.05, silicon 0.01-1.7, sulfur 0-0.02, titanium 0-0.2, titanium and niobium 0.015-0.2, zirconium 0.0001-0.05, in mass%, and is provided with a structure represented by, in terms of area ratio, 5-95% ferrite and 5-95% bainite. When a crystal grain is defined as a region which is surrounded by grain boundaries having disorientation of 15°-or higher and for which the equiv. circle diam. is 0.3μm or larger, the proportion of crystal grains having an intragranular disorientation of 5-14°-relative to all of crystal grains is 20-100% in terms of area ratio. The steel plate comprises hard material crystal grains A in which ppts. or clusters with max. diam. of no larger than 8 nm are distributed in no. d. of 1×1016-1×1019 particles/cm3, and soft material crystal grains B in which ppts. or clusters with a max. diam. of no larger than 8 nm are distributed in no. d. of no higher than 1×1015 particles/cm3, and the vol.% of hard material crystal grains A/(vol.% of hard material crystal grains A+vol.% of soft material crystal grains B) is 0.1-0.9. The plated steel plate has galvannealed galvanized plating layer. The steel plate has high strength, good ductility and stretch flangeability, and high yield stress.

IT 2178084-33-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(low-carbon steel sheet and plated steel sheet for automobile parts)
RN 2178084-33-6 CAPLUS
CN Iron alloy, base, Fe 89-99,Mn 0.6-2.5,Cu 0-2,Ni 0-2,Si 0-1.7,Cr 0-1,Mo 0-1,Al 0-0.6,C 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	99	7439-89-6
Mn	0.6	-	2.5	7439-96-5
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Si	0	-	1.7	7440-21-3
Cr	0	-	1	7440-47-3
Mo	0	-	1	7439-98-7
Al	0	-	0.6	7429-90-5
C	0	-	0.2	7440-44-0

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    Nb      0   -   0.2      7440-03-1
    Ti      0   -   0.2      7440-32-6
    B       0   -   0.1      7440-42-8

IPCI C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [N]
IPCR C22C0038-00 [I]; C21D0009-46 [N]; C22C0038-58 [I]
CC   55-3 (Ferrous Metals and Alloys)
ST   low carbon steel sheet plating automobile part
IT   Automobile parts
     Elongation, mechanical
     Galvannealing
     Grain size
     Hot-dip galvanizing
     Microstructure
     Sheet materials
     Tensile strength
     Yield strength
        (low-carbon steel sheet and plated steel sheet for
        automobile parts)
IT   2178084-33-6
     RL: PRP (Properties); TEM (Technical or engineered material use); USES
     (Uses)
        (low-carbon steel sheet and plated steel sheet for
        automobile parts)
OS.CITING REF COUNT:     1     THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
                               (1 CITINGS)


L13  ANSWER 30 OF 103  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2017:848898  CAPLUS Full-text
TITLE:                   Contact Fatigue Resistance of Carburized Gears from
                         Chromium-Nickel Steels
AUTHOR(S):               Rudenko, S. P.; Val'ko, A. L.
CORPORATE SOURCE:        United Institute for Mechanical Engineering, National
                         Academy of Sciences of Belarus, Minsk, Belarus
SOURCE:                  Metal Science and Heat Treatment (2017), 59(1-2),
                         60-64
                         CODEN: MHTRAN; ISSN: 0026-0673
DIGITAL OBJECT ID:       10.1007/s11041-017-0103-3
PUBLISHER:               Springer
DOCUMENT TYPE:           Journal; (online computer file)
LANGUAGE:                English
AB   The contact fatigue resistance of carburized gears produced from
     chromium-nickel steels is studied. The curves of deep contact fatigue of
     the material of the gears are plotted in terms of the criterion of
     equality of the characteristics of diffusion layers. An expression for
     ultimate deep contact fatigue resistance of carburized gears is derived.
RETABLE
   Referenced Author   |Year | VOL | PG   | Referenced Work    | Referenced
         (RAU)         |(RPY)|(RVL)|(RPG) |      (RWK)         | File
=======================+=====+=====+======+====================+===========
Anon                   |     |     |      |A A Susin, Thermoche|
Anon                   |     |     |      |A I Petrusevich, Con|
Anon                   |     |     |      |A N Utkina, Yu Yu Ch|
Anon                   |     |     |      |B A Balashov, R R Ga|
Anon                   |     |     |      |B V Gold, E P Obolen|
Anon                   |     |     |      |E B Vulgakov (ed.), |
Anon                   |     |     |      |E I Tesker, Advanced|
Anon                   |     |     |      |N M Ryzhov, "Technol|
Anon                   |     |     |      |S P Rudenko and A L |
Anon                   |     |     |      |S P Rudenko, "A stud|
Anon                   |     |     |      |S P Rudenko, "Comput|
Anon                   |     |     |      |S P Rudenko, "Fatigu|
Anon                   |     |     |      |S P Rudenko, A L Val|
Anon                   |     |     |      |V E Antonyuk, B V Iv|
Anon                   |     |     |      |Yu S Eliseev, V V Kr|
IT   INDEXING IN PROGRESS
IT   37312-00-8
     RL: PEP (Physical, engineering or chemical process); PRP (Properties);
     PROC (Process)
        (contact fatigue resistance of carburized gears from chromium-nickel
        steels)
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ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 97	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST chromium nickel steel carburized gear contact fatigue resistance
IT Diffusion
Fatigue resistance
Gears
Microhardness
Microstructure
(contact fatigue resistance of carburized gears from chromium-nickel steels)
IT 12681-03-7 12742-08-4 37312-00-8 39411-21-7
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(contact fatigue resistance of carburized gears from chromium-nickel steels)

L13 ANSWER 31 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:342418 CAPLUS Full-text
DOCUMENT NUMBER: 166:297159
TITLE: Method for manufacturing steel plate with aluminum or aluminum alloy coating by hot stamping
INVENTOR(S): Liu, Xin; Hong, Zhenjun; Tan, Ning; Jin, Xinyan; Liu, Junxiang; Hong, Jiyao
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 15pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 106466697	A	20170301	CN 2016-10664566	20160812
CN 106466697	B	20200131		

PRIORITY APPLN. INFO.: CN 2016-10664566 20160812
AB The invention discloses a manuf. method of steel plate, which comprises the following steps: blanking the steel plate with aluminum or aluminum alloy coating by blanking or laser cutting, induction heating, hot stamping in die, and cooling. The temp. and time of heating are detd. by the thickness of steel plate. The components of the steel plate is as follows: C 0.08-0.8%, Si 0.05-1.0%, Mn 0.1-5%, P<0.3%, S<0.1%, Al<0.3%, Ti<0.5%, B 0.0005-0.1%, Cr 0.01-3%, and balance of Fe and inevitable impurities. The coating comprises alloy layer, aluminum enriched intermetallic compd. layer, intermediate layer and surface layer. The components of the alloy layer is Si 0-6%, Fe 75-96%, Al 2-12%; the components of the aluminum enriched intermetallic compd. layer is Si 0-2%, Fe 30-50%, Al 40-60%; the components of the intermediate layer is Si 2-6%, Fe 50-65%, Al 20-35%; and the components of the surface layer is Si 2-6%, Fe 50-65%, Al 20-35%. The product has high strength, complex

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

shape, good formability, high precision, and small springback, which can be used for automobile parts such as bumper, pillar reinforced plate, floor inside passage, and stiffening beam, etc..

IT 2067242-22-0P, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

RN 2067242-22-0 CAPLUS

CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	89	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Cr	0	-	3	7440-47-3
Si	0	-	1	7440-21-3
C	0.1	-	0.8	7440-44-0
Ti	0	-	0.5	7440-32-6
Al	0	-	0.3	7429-90-5
P	0	-	0.3	7723-14-0
B	0	-	0.1	7440-42-8
S	0	-	0.1	7704-34-9

IPCI B21D0053-88; C22C0038-02; C22C0038-04; C22C0038-06; C22C0038-32; C22C0038-60; C23C0002-12; C23C0002-40

IPCR B21D0053-88 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-32 [I]; C22C0038-60 [I]; C23C0002-12 [I]; C23C0002-40 [I]

CC 55-1 (Ferrous Metals and Alloys)

ST hot stamping aluminum alloy steel plate coating manuf

IT Coating materials
Cooling
Induction heating
Industrial manufacturing
Laser cutting
Quenching (cooling)
Transmissions (mechanical)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT Metalworking
(stamping, hot; method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT 2067242-22-0P, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal. 2087430-40-6P, Aluminum 2-12, iron 75-96, silicon 0-6 2087430-41-7P, Aluminum 40-60, iron 30-50, silicon 0-2 2087430-42-8P, Aluminum 20-35, iron 50-65, silicon 2-6
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT 2087430-39-3, Iron 0-4, silicon 5-11, Aluminum bal.
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

IT 7429-90-5, Aluminum, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. steel plate with aluminum or aluminum alloy coating by hot stamping)

L13 ANSWER 32 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:227313 CAPLUS Full-text
DOCUMENT NUMBER: 166:249360
TITLE: Hot rolled steel sheet and its manufacture for

automobile parts
INVENTOR(S): Sakakibara, Chikami; Sugiura, Natsuko; Tanaka, Yasuaki; Tanei, Hiroshi; Fujii, Takashi; Yokoyama, Takashi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2017031454	A	20170209	JP 2015-150831	20150730
JP 6620446	B2	20191218		
WO 2017022025	A1	20170209	WO 2015-JP71845	20150731

PRIORITY APPLN. INFO.: JP 2015-150831 T0 20150730

AB To provide hot-rolled steel plate excellent in pickling property and without an increase in equipment cost, generation of internal oxide layer of a high strength hot rolled steel sheet contg. relatively large amts. of Si and Mn is suppressed, and method for manufg. thereof. Hot-rolled steel plate comprises C: 0.04-0.6%, Si: 0.01-3%, Mn: 0.1-5%, P: 0.04% or less, S: 0.05% or less, Al: 0.001-2%, N: 0.01% or less, O: 0.01% or less, one or more of Sb, Sn and Te: total amt. of 0.01-0.3% and remainder of Fe and unavoidable impurities, and has thickness of the internal oxide layer of 5 μm or less, a concd. layer of Sb, Sn and Te as an upper layer of the internal oxide layer, and has mech. properties with a tensile strength of 590 MPa or more.

IT 2079034-18-5P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high strength hot rolled steel sheet and its manuf. for automobile parts)
RN 2079034-18-5 CAPLUS
CN Iron alloy, base, Fe 80-100,Mn 0.1-5,Si 0-3,Al 0-2,Cr 0-2,Cu 0-2,Ni 0-2,Mo 0-1,C 0-0.6,Nb 0-0.3,Sb 0-0.3,Sn 0-0.3,Te 0-0.3,Ti 0-0.3,V 0-0.3,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	100	7439-89-6
Mn	0.1	-	5	7439-96-5
Si	0	-	3	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Cu	0	-	2	7440-50-8
Ni	0	-	2	7440-02-0
Mo	0	-	1	7439-98-7
C	0	-	0.6	7440-44-0
Nb	0	-	0.3	7440-03-1
Sb	0	-	0.3	7440-36-0
Sn	0	-	0.3	7440-31-5
Te	0	-	0.3	13494-80-9
Ti	0	-	0.3	7440-32-6
V	0	-	0.3	7440-62-2
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]
IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-60 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST hot rolled steel sheet manuf automobile part
IT Automobile parts
Casting of metals
Hot rolling
Melting
Microstructure
Pickling
Sheet materials
Tensile strength
(high strength hot rolled steel sheet and its manuf. for

automobile parts)
IT 2079034-18-5P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high strength hot rolled steel sheet and its manuf. for automobile parts)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 33 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2017:100416 CAPLUS Full-text
DOCUMENT NUMBER: 166:179501
TITLE: Steel welding part with aluminum or aluminum alloy plating layer and manufacture method thereof
INVENTOR(S): Pan, Hua; Su, Yongchao; Lei, Ming; Shi, Lei; Jiang, Haomin
PATENT ASSIGNEE(S): Baoshan Iron & Steel Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing, 8pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
CN 106334875	A	20170118	CN 2016-10953787		20161027
WO 2018077067	A1	20180503	WO 2017-CN106516		20171017
MX 2019004121	A	20190606	MX 2019-4121		20171017
KR 2019069471	A	20190619	KR 2019-7013481		20171017
EP 3533558	A1	20190904	EP 2017-864438		20171017
JP 2019535894	T	20191212	JP 2019-520992		20171017
US 20200038998	A1	20200206	US 2019-16339215		20190403
IN 201917015151	A	20190719	IN 2019-17015151		20190415
PRIORITY APPLN. INFO.:			CN 2016-10953787	A	20161027
			WO 2017-CN106516	W	20171017

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention discloses a steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof. The steel welding part with aluminum or aluminum alloy plating layer comprises a steel substrate and a plating layer, the plating layer comprises an intermetallic compd. alloy layer in contact with the substrate, and a metal alloy layer thereon; which is characterized in that on at least one of the plated surfaces of the weld blank, the plating layer located in the area to be welded of the weld blank is completely removed, and the end face of the welding blank part plating layer removed the region to be welded is perpendicular to the surface of the substrate which is parallel to weld seam to form an included angle β, and the included angle β =0-80°. A method of manufg. steel welding part with aluminum or aluminum alloy plating layer is characterized in that it includes the steps of: obtaining weld blank by welding according to the requirements of steel welding part with aluminum or aluminum alloy plating layer, welding the area to be welded of the weld blank where the plating layer has been completely removed to form a welded joint; obtaining a part by hot stamping, selecting a cooling rate which is greater than the crit. transformation speed of the matrix martensite quenching, and cooling. This invention ensures tensile strength, elongation rate and corrosion resistance of welding joint after hot stamping.
IT 2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8, chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur 0-0.1, titanium 0-0.5, iron bal.
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel welding part with aluminum or aluminum alloy plating layer and manuf. method thereof)
RN 2067242-22-0 CAPLUS
CN Iron alloy, base, Fe 89-100,Mn 0.1-5,Cr 0-3,Si 0-1,C 0.1-0.8,Ti 0-0.5,Al 0-0.3,P 0-0.3,B 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

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=========+=============+===============
    Fe     89   - 100        7439-89-6
    Mn      0.1 -   5        7439-96-5
    Cr      0   -   3        7440-47-3
    Si      0   -   1        7440-21-3
    C       0.1 -   0.8      7440-44-0
    Ti      0   -   0.5      7440-32-6
    Al      0   -   0.3      7429-90-5
    P       0   -   0.3      7723-14-0
    B       0   -   0.1      7440-42-8
    S       0   -   0.1      7704-34-9

IPCI B23K0026-32; C22C0038-04; C22C0038-02; C22C0038-06; C22C0038-14;
     C22C0038-18; C23C0002-12; B23K0103-20
IPCR B23K0026-32 [I]; B23K0103-20 [N]; C22C0038-02 [I]; C22C0038-04 [I];
     C22C0038-06 [I]; C22C0038-14 [I]; C22C0038-18 [I]; C23C0002-12 [I]
CC   56-9 (Nonferrous Metals and Alloys)
     Section cross-reference(s): 47
ST   steel welding part aluminum alloy plating layer
IT   Metalworking
        (stamping, hot; steel welding part with aluminum or aluminum
        alloy plating layer and manuf. method thereof)
IT   Corrosion-resistant materials
     Industrial manufacturing
     Joints, mechanical
     Laser ablation
     Laser welding
     Plating process
     Welding apparatus
     Welds
        (steel welding part with aluminum or aluminum alloy plating
        layer and manuf. method thereof)
IT   12003-42-8   12004-62-5   12043-58-2
     RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
        (steel welding part with aluminum or aluminum alloy plating
        layer and manuf. method thereof)
IT   1273096-81-3P, Aluminum alloy
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); TEM (Technical or engineered material use); PREP (Preparation);
     PROC (Process); USES (Uses)
        (steel welding part with aluminum or aluminum alloy plating
        layer and manuf. method thereof)
IT   2067242-22-0, Aluminum 0-0.3, boron 0-0.1, carbon 0.1-0.8,
     chromium 0-3, manganese 0.1-5, phosphorus 0-0.3, silicon 0-1, sulfur
     0-0.1, titanium 0-0.5, iron bal.
     RL: PEP (Physical, engineering or chemical process); TEM (Technical or
     engineered material use); PROC (Process); USES (Uses)
        (steel welding part with aluminum or aluminum alloy plating
        layer and manuf. method thereof)
OS.CITING REF COUNT:     2     THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD
                               (2 CITINGS)


L13  ANSWER 34 OF 103  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2016:2049760  CAPLUS Full-text
DOCUMENT NUMBER:         167:333389
TITLE:                   Method for hot forming a coated metal part and
                         formed part
INVENTOR(S):             Verloop, Willem Cornelis; Van Genderen, Marc Jacco;
                         Van Tol, Ronald Theodoor; Hensen, Guido Cornelis;
                         Loiseaux, Jenny
PATENT ASSIGNEE(S):      Tata Steel IJmuiden B.V., Neth.
SOURCE:                  U.S., No pp. given
                         CODEN: USXXAM
DOCUMENT TYPE:           Patent
LANGUAGE:                English
FAMILY ACC. NUM. COUNT:  2
PATENT INFORMATION:
     PATENT NO.          KIND  DATE        APPLICATION NO.          DATE
     ----------------    ----  --------    ---------------------    --------
     US 9127329           B2   20150908    US 2013-13818041         20130220
     US 20130153094       A1   20130620
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WO 2012028224 A1 20120308 WO 2011-EP3601 20110719
PRIORITY APPLN. INFO.: EP 2010-9041 A 20100831
WO 2011-EP3601 W 20110719
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A method for manufg. a coated part having very high mech. properties using hot forming techniques. The method includes: -providing an annealed steel strip or blank or pre-shaped part that was coated with a metal or metal alloy before the annealing -if a strip is provided, cutting a blank from the strip before or after the annealing -optionally forming a pre-shaped part from the blank -heating the blank or preshaped part to a temp. of 500° C. at an av. heating rate of 16° C./s or more -further heating the blank or pre-shaped part to a temp. between 700 and 1000° C. -hot forming the blank or preshaped part into a hot formed part -hardening the hot formed part. A method for manufg. a coated steel strip, blank or pre-shaped part, and a coated steel strip, blank or part and a hot formed part.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2009			DE 102008022400 A1	CAPLUS
Anon	2009			WO 2009021743 A1	CAPLUS
Anon	2009			WO 2009096351 A1	CAPLUS
Anon	2010			WO 2010005121 A1	CAPLUS
Anon	2010			WO 2010069588 A1	CAPLUS
Anon	2010			WO 2010085983 A1	CAPLUS
Anon	2010			EP 2177641 A1	CAPLUS
Anon	2002			"Glossary of Metallu	
Anon	2011			International Search	
Brandstatter	2011			US 20110045316 A1	CAPLUS
Hensen	2011			US 20110236719 A1	CAPLUS
Maki	2011			US 20110174418 A1	CAPLUS
Mehler	1962			US 3056694 A	CAPLUS
Oh	2008			US 20080286603 A1	CAPLUS
Thirion	2012			US 20120085467 A1	CAPLUS
Toki	2011			US 20110048585 A1	CAPLUS
Vlot	2010			US 20100026048 A1	CAPLUS

IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)
RN 1360605-36-2 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Nb	0 - 0.1	7440-03-1
P	0 - 0.1	7723-14-0
V	0 - 0.1	7440-62-2

IPCI C21D0008-02 [I]; C21D0009-46 [I]; C23C0002-06 [I]; C23C0002-40 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0008-04 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C23C0010-28 [I]; C23C0010-60 [I]; C21D0008-02 [I]; B32B0015-01 [I]
IPCR C21D0008-02 [I]; B32B0015-01 [I]; C21D0001-673 [I]; C21D0008-04 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C23C0010-28 [I]; C23C0010-60 [I]
NCL 001/001.000; 148/533.000; 148/330.000
CC 55-3 (Ferrous Metals and Alloys)
ST steel strip coating hot deformation
IT Plastic deformation

(hot; method for manuf. coated steel parts by hot forming)
IT 1360605-37-3
RL: TEM (Technical or engineered material use); USES (Uses)
(coating; method for manuf. coated steel parts by hot forming)
IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)

L13 ANSWER 35 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1997298 CAPLUS Full-text
DOCUMENT NUMBER: 167:180612
TITLE: Coated steel strips, methods of making the same, methods of using the same, stamping blanks prepared from the same, stamped products prepared from the same, and articles of manufacture which contain such a stamped product
INVENTOR(S): Drillet, Pascal; Spehner, Dominique; Kefferstein, Ronald
PATENT ASSIGNEE(S): Arcelormittal France, Fr.
SOURCE: U.S. Pat. Appl. Publ., No pp. given
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20110165436	A1	20110707	US 2011-447777	20110318
WO 2008053273	A1	20080508	WO 2006-IB4019	20061030
EP 3290199	A1	20180307	EP 2017-192410	20061030
EP 3290199	B1	20190821		
EP 3290200	A1	20180307	EP 2017-192418	20061030
EP 3587104	A1	20200101	EP 2019-185736	20061030
EP 3587105	A1	20200101	EP 2019-185743	20061030
US 20130029172	A1	20130131	US 2012-13621015	20120915
US 9708683	B2	20170718		
US 20170260603	A1	20170914	US 2017-15606770	20170526
US 10550447	B2	20200204		
US 20190271055	A1	20190905	US 2019-16413774	20190516
US 10590507	B2	20200317		
US 20190271056	A1	20190905	US 2019-16413799	20190516
US 20190271057	A1	20190905	US 2019-16413825	20190516
US 20190271058	A1	20190905	US 2019-16414022	20190516
US 10597747	B2	20200324		
US 20190276912	A1	20190912	US 2019-16413729	20190516
US 10577674	B2	20200303		

PRIORITY APPLN. INFO.:

WO 2006-IB4019	W	20061030
EP 2006-842403	A3	20061030
EP 2017-192410	A3	20061030
US 2011-447777	A3	20110318
US 2012-13621015	A1	20120915
US 2017-15606770	A1	20170526

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Coated steel having a well defined and uniform thickness is useful and advantageous for prepg. products by hot stamping. Products prepd. by hot stamping such a steel are particularly advantageous when subjected to a subsequent spot welding step.
IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
RN 1022915-01-0 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component Component Component

	Percent			Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

INCL 428653000; 072342100; 072047000
IPCI B32B0015-01 [I]; B21D0022-00 [I]; C21D0009-46 [I]
IPCR B32B0015-01 [I]; B21D0022-00 [I]; C21D0009-46 [I]
NCL 428/653.000; 072/047.000; 072/342.100
CC 55-11 (Ferrous Metals and Alloys)
ST aluminum coated steel strip stamping article spot welding
IT Metalworking
(stamping; aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
IT 7429-90-5, Aluminum, uses 952598-91-3, Aluminum 87-90, iron 2-4, silicon 8-11
RL: NUU (Other use, unclassified); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)

L13 ANSWER 36 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1770673 CAPLUS Full-text
DOCUMENT NUMBER: 165:549448
TITLE: Production of hot or cold strips from steel having high copper content
INVENTOR(S): Redenius, Alexander; Evertz, Thomas; Palzer, Peter
PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: PCT Int. Appl., 23pp.; Chemical Indexing Equivalent to 165:549447 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016174020	A1	20161103	WO 2016-EP59266	20160426
DE 102015106780	A1	20161103	DE 2015-102015106780	20150430

PRIORITY APPLN. INFO.: DE 2015-102015106780 A 20150430
AB A hot or cold strip of steel with high copper content, is manufd. by: melting a steel melt contg. (in wt.%) 0-0.4% C, 0-3% Mn, 0-2% Al, 0-2% Si, more than 0.8% Cu, 0-0.2% P, 0-0.05% S, and 0-0.3% N, with optional addn. of Sn, Ni, Cr, V, Nb, Ti, Mo, W, B, Co, Sb and/or Zr, the remainder being iron and unavoidable impurities; casting the melt under an atm. having an oxygen content <10 vol.%, by a near-net-shape casting method, in particular horizontal strip casting or vertical casting according to the two-roll method, into a pre-strip having a thickness in of 1-30 mm; cooling the cast pre-strip at a cooling rate ≥100 K/s at the actively cooled strip surface until forming a rigid boundary layer.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
FANG YUAN	2014			US 20140366602 A1	
GUELTON NICOLAS PATRICE	2004			EP 1466024 A1	CAPLUS
IKI HIROSHI	2000			JP 2000045045 A	CAPLUS
IUNG THIERRY	2001			EP 1072689 A1	CAPLUS
MARUYAMA NAOKI	2005			JP 2005036271 A	CAPLUS
MIZOGUCHI TOSHIAKI NIPP	1995			EP 0641867 A1	CAPLUS

UENISHI AKIHIRO |2000 | | |EP 0969112 A1 |CAPLUS
YAMAKAWA TSUNAHIRO |1992 | | |US 5098489 A |CAPLUS

IT 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)
RN 2031158-69-5 CAPLUS
CN Iron alloy, base, Fe 68-99,Cu 0.8-5,Cr 0-4,Co 0-3,Mn 0-3,Mo 0-3,W 0-3,Al 0-2,Ni 0-2,Si 0-2,Nb 0-0.9,Ti 0-0.9,V 0-0.9,Sn 0-0.5,Zr 0-0.5,C 0-0.4,B 0-0.3,N 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	68	-	99	7439-89-6
Cu	0.8	-	5	7440-50-8
Cr	0	-	4	7440-47-3
Co	0	-	3	7440-48-4
Mn	0	-	3	7439-96-5
Mo	0	-	3	7439-98-7
W	0	-	3	7440-33-7
Al	0	-	2	7429-90-5
Ni	0	-	2	7440-02-0
Si	0	-	2	7440-21-3
Nb	0	-	0.9	7440-03-1
Ti	0	-	0.9	7440-32-6
V	0	-	0.9	7440-62-2
Sn	0	-	0.5	7440-31-5
Zr	0	-	0.5	7440-67-7
C	0	-	0.4	7440-44-0
B	0	-	0.3	7440-42-8
N	0	-	0.3	17778-88-0
P	0	-	0.2	7723-14-0

IPCI C22C0038-00 [I]; B22D0011-00 [I]; B22D0011-06 [I]; B22D0011-106 [I]; B22D0011-124 [I]; B22D0011-14 [I]; B22D0011-22 [I]; B22D0015-00 [I]; B22D0037-00 [I]; C21D0006-00 [I]; C21D0008-02 [I]; C21D0001-26 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-16 [I]; B22D0011-112 [I]; C21D0006-02 [I]
IPCR C22C0038-00 [I]; B22D0011-00 [I]; B22D0011-06 [I]; B22D0011-106 [I]; B22D0011-112 [I]; B22D0011-124 [I]; B22D0011-14 [I]; B22D0011-22 [I]; B22D0015-00 [I]; B22D0037-00 [I]; C21D0001-26 [I]; C21D0006-00 [I]; C21D0006-02 [I]; C21D0008-02 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C22C0038-06 [I]; C22C0038-16 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST hot cold strip steel copper casting cooling
IT Annealing
Casting of metals
Cooling
Hot rolling
(prodn. of hot or cold strips from steel having high copper content)
IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(casting atm.; prodn. of hot or cold strips from steel having high copper content)
IT 2031158-68-4P 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)

L13 ANSWER 37 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1770568 CAPLUS Full-text
DOCUMENT NUMBER: 165:549447
TITLE: Production of hot or cold strips from steel having high copper content
INVENTOR(S): Redenius, Alexander; Evertz, Thomas; Palzer, Peter

PATENT ASSIGNEE(S): Salzgitter Flachstahl GmbH, Germany
SOURCE: Ger. Offen., 9pp.; Chemical Indexing Equivalent to 165:549448 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102015106780	A1	20161103	DE 2015-102015106780	20150430
WO 2016174020	A1	20161103	WO 2016-EP59266	20160426

PRIORITY APPLN. INFO.: DE 2015-102015106780 A 20150430

AB A hot or cold strip of steel with high copper content, is manufd. by: melting a steel melt contg. (in wt.%) 0-0.4% C, 0-3% Mn, 0-2% Al, 0-2% Si, more than 0.8% Cu, 0-0.2% P, 0-0.05% S, and 0-0.3% N, with optional addn. of Sn, Ni, Cr, V, Nb, Ti, Mo, W, B, Co, Sb and/or Zr, the remainder being iron and unavoidable impurities; casting the melt under an atm. having an oxygen content <10 vol.%, by a near-net-shape casting method, in particular horizontal strip casting or vertical casting according to the two-roll method, into a pre-strip having a thickness in of 1-30 mm; cooling the cast pre-strip at a cooling rate ≥100 K/s at the actively cooled strip surface until forming a rigid boundary layer.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon				DE 112013001434 T5	CAPLUS
Anon				WO 2015003755 A1	CAPLUS
Anon				EP 2546368 A1	CAPLUS
Anon				DE 60306365 T2	
Anon	2013			M Bausch et al:Ultra	

IT 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)
RN 2031158-69-5 CAPLUS
CN Iron alloy, base, Fe 68-99,Cu 0.8-5,Cr 0-4,Co 0-3,Mn 0-3,Mo 0-3,W 0-3,Al 0-2,Ni 0-2,Si 0-2,Nb 0-0.9,Ti 0-0.9,V 0-0.9,Sn 0-0.5,Zr 0-0.5,C 0-0.4,B 0-0.3,N 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	68 - 99	7439-89-6
Cu	0.8 - 5	7440-50-8
Cr	0 - 4	7440-47-3
Co	0 - 3	7440-48-4
Mn	0 - 3	7439-96-5
Mo	0 - 3	7439-98-7
W	0 - 3	7440-33-7
Al	0 - 2	7429-90-5
Ni	0 - 2	7440-02-0
Si	0 - 2	7440-21-3
Nb	0 - 0.9	7440-03-1
Ti	0 - 0.9	7440-32-6
V	0 - 0.9	7440-62-2
Sn	0 - 0.5	7440-31-5
Zr	0 - 0.5	7440-67-7
C	0 - 0.4	7440-44-0
B	0 - 0.3	7440-42-8
N	0 - 0.3	17778-88-0
P	0 - 0.2	7723-14-0

IPCI C22C0038-04 [I]; C22C0038-16 [I]; C21D0008-00 [I]; B22D0011-06 [I]; B22D0011-116 [I]; B22D0011-12 [I]; C22C0111-00 [I]
IPCR C22C0038-04 [I]; B22D0011-06 [I]; B22D0011-116 [I]; B22D0011-12 [I]; C21D0008-00 [I]; C22C0038-16 [I]; C22C0111-00 [N]
CC 55-3 (Ferrous Metals and Alloys)
ST hot cold strip steel copper casting cooling
IT Annealing

Casting of metals
Cooling
Hot rolling
(prodn. of hot or cold strips from steel having high copper content)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(casting atm.; prodn. of hot or cold strips from steel having high copper content)

IT 2031158-68-4P 2031158-69-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(strips; prodn. of hot or cold strips from steel having high copper content)

L13 ANSWER 38 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2016:1617614 CAPLUS Full-text
DOCUMENT NUMBER: 165:466273
TITLE: Composition and manufacture of carbon steel sheet suitable for hot stamping, and hot stamping molded parts
INVENTOR(S): Azuma, Masafumi; Suwa, Yoshihiro; Kondo, Yusuke; Sato, Koichi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 49pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2016158961	A1	20161006	WO 2016-JP60145	20160329
CA 2979978	A1	20161006	CA 2016-2979978	20160329
KR 2017122823	A	20171106	KR 2017-7027982	20160329
KR 2000863	B1	20190716		
CN 107427889	A	20171201	CN 2016-80017529	20160329
CN 107427889	B	20191025		
MX 2017012377	A	20171214	MX 2017-12377	20160329
EP 3278895	A1	20180207	EP 2016-772842	20160329
EP 3278895	B1	20200311		
BR 112017020165	A2	20180605	BR 2017-112017020165	20160329
RU 2683397	C1	20190328	RU 2017-135379	20160329
JP 6515356	B2	20190522	JP 2017-510030	20160329
ES 2781465	T3	20200902	ES 2016-772842	20160329
TW I597370	B	20170901	TW 2016-110064	20160330
US 20180044754	A1	20180215	US 2017-15559731	20170919
IN 201717033300	A	20171201	IN 2017-17033300	20170920

PRIORITY APPLN. INFO.: JP 2015-72280 A 20150331
WO 2016-JP60145 W 20160329
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A steel sheet for hot stamping contains, in percentage by wt., C: 0.100%-0.600%, Si: 0.50%-3.00%, Mn: 1.20%-4.00%, Ti: 0.005%-0.100%, B: 0.0005%-0.100%, P: 0.100% or less, S: 0.0001%-0.0100%, Al: 0.005%-1.000%, and N: 0.100% or less, with the remainder comprising Fe and impurities. The steel sheet surface roughness is such that Rz > 2.5 μm, and the surface is coated with 50 mg/m2-1,500 mg/m2 of oil coated thereon.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1997			JP 976004 A	
HAYASHI KUNIO	2012			WO 2012053636 A1	CAPLUS
KAWASAKI KAORU	2011			WO 2011158818 A1	CAPLUS
KOJIMA TAKESHI	2014			JP 2014159624 A	CAPLUS
KUSUMI KAZUHISA	2008			JP 2008240046 A	CAPLUS
SETO KAZUHIRO	2010			JP 2010174302 A	CAPLUS

IT 2015959-64-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or

engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)
RN 2015959-64-3 CAPLUS
CN Iron alloy, base, Fe 83-98,Mn 1.2-4,Si 0.5-3,Cr 0-2,Cu 0-2,Mo 0-2,Ni 0-2,Al 0-1,C 0.1-0.6,B 0-0.1,Nb 0-0.1,P 0-0.1,Ti 0-0.1,V 0-0.1,W 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	83	-	98	7439-89-6
Mn	1.2	-	4	7439-96-5
Si	0.5	-	3	7440-21-3
Cr	0	-	2	7440-47-3
Cu	0	-	2	7440-50-8
Mo	0	-	2	7439-98-7
Ni	0	-	2	7440-02-0
Al	0	-	1	7429-90-5
C	0.1	-	0.6	7440-44-0
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0
Ti	0	-	0.1	7440-32-6
V	0	-	0.1	7440-62-2
W	0	-	0.1	7440-33-7

IPCI B21D0022-20 [I]; B21D0024-00 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-14 [I]; C22C0038-58 [I]; C23F0011-00 [I]; C23G0001-08 [I]
IPCR B21D0022-20 [I]; B21D0024-00 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-14 [I]; C22C0038-58 [I]; C23F0011-00 [I]; C23G0001-08 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST carbon steel sheet manuf hot stamping molded part
IT Adhesion, physical
Annealing
Casting of metals
Cold rolling
Hot rolling
Lubrication
Pickling
Scale (deposits)
Sheet materials
Surface roughness
Tensile strength
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)
IT Metalworking
(stamping, hot; compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)
IT 2015959-64-3P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(compn. and manuf. of carbon steel sheet suitable for hot stamping, and hot stamping molded parts)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 39 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2015:1942164 CAPLUS Full-text
DOCUMENT NUMBER: 164:40753
TITLE: Steel sheet provided with a sacrificial cathodically protected coating comprising lanthanum
INVENTOR(S): Allely, Christian; Petitjean, Jacques
PATENT ASSIGNEE(S): ArcelorMittal Investigacion y Desarrollo, S.L., Spain
SOURCE: PCT Int. Appl., 20pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 2015181581	A1	20151203	WO 2014-IB61788		20140528
CA 2950476	A1	20151203	CA 2015-2950476		20150528
WO 2015181318	A1	20151203	WO 2015-EP61891		20150528
KR 2017010773	A	20170201	KR 2016-7032934		20150528
CN 106460138	A	20170222	CN 2015-80027730		20150528
EP 3149217	A1	20170405	EP 2015-724718		20150528
EP 3149217	B1	20180711			
JP 2017524806	T	20170831	JP 2016-569819		20150528
JP 6762879	B2	20200930			
ES 2689039	T3	20181108	ES 2015-724718		20150528
RU 2689979	C2	20190530	RU 2016-146657		20150528
ZA 2016007435	A	20171220	ZA 2016-7435		20161027
IN 201617039713	A	20170310	IN 2016-17039713		20161121
IN 343260	B	20200804			
MX 2016015550	A	20170425	MX 2016-15550		20161125
US 20170198374	A1	20170713	US 2016-15314457		20161128
US 10676804	B2	20200609			
PRIORITY APPLN. INFO.:			WO 2014-IB61788	A	20140528
			WO 2015-EP61891	W	20150528

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention relates to a steel sheet provided with a sacrificial cathodically protected coating comprising between 1 and 40 % by wt. zinc, between 0.01 and 0.4 % by wt. lanthanum, and optionally up to 10 % by wt. magnesium, optionally up to 15 % by wt. silicon, and optionally up to 0.3 % by wt., in cumulative amts., of addnl. components, the remainder consisting of aluminum and unavoidable impurities or residual elements. The invention also relates to a method of producing parts by hot or cold swaging and the parts which can be obtained in this way.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
LIXIN FENG	2010			CN 101736217 A	CAPLUS
MORIMOTO YASUHIDE	2009			JP 2009120942 A	CAPLUS
NOSE KOICHI	2008			EP 1997927 A1	CAPLUS
ZHAO YUNJIE	2013			CN 103045980 A	CAPLUS

IT 1173986-65-6

RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)

RN 1173986-65-6 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C22C0021-10 [I]

IPCR C23C0002-12 [I]; C22C0021-10 [I]

CC 56-3 (Nonferrous Metals and Alloys)

ST steel sheet sacrificial cathodically protected coating lanthanum swaging

IT Anticorrosive coating materials
Coating process
Swaging
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)

IT 7439-91-0, Lanthanum, uses

RL: MOA (Modifier or additive use); USES (Uses)
(steel sheet provided with sacrificial cathodically protected

coating comprising lanthanum)
IT 12597-69-2, Steel, uses 1173986-65-6
RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 1832643-11-4
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)

L13 ANSWER 40 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2015:1942163 CAPLUS Full-text
DOCUMENT NUMBER: 164:40752
TITLE: Steel sheet provided with a sacrificial cathodically protected coating comprising lanthanum
INVENTOR(S): Allely, Christian; Petitjean, Jacques
PATENT ASSIGNEE(S): ArcelorMittal, Luxembourg
SOURCE: PCT Int. Appl., 21pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2015181318	A1	20151203	WO 2015-EP61891	20150528
WO 2015181581	A1	20151203	WO 2014-IB61788	20140528
CA 2950476	A1	20151203	CA 2015-2950476	20150528
KR 2017010773	A	20170201	KR 2016-7032934	20150528
CN 106460138	A	20170222	CN 2015-80027730	20150528
EP 3149217	A1	20170405	EP 2015-724718	20150528
EP 3149217	B1	20180711		
JP 2017524806	T	20170831	JP 2016-569819	20150528
JP 6762879	B2	20200930		
ES 2689039	T3	20181108	ES 2015-724718	20150528
RU 2689979	C2	20190530	RU 2016-146657	20150528
IN 201617039713	A	20170310	IN 2016-17039713	20161121
IN 343260	B	20200804		
MX 2016015550	A	20170425	MX 2016-15550	20161125
US 20170198374	A1	20170713	US 2016-15314457	20161128
US 10676804	B2	20200609		

PRIORITY APPLN. INFO.: WO 2014-IB61788 A 20140528
WO 2015-EP61891 W 20150528
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The invention relates to a steel sheet provided with a sacrificial cathodically protected coating comprising between 1 and 40 % by wt. zinc, between 0.01 and 0.4 % by wt. lanthanum, and optionally up to 10 % by wt. magnesium, optionally up to 15 % by wt. silicon, and optionally up to 0.3 % by wt., in cumulative amts., of addnl. components, the remainder consisting of aluminum and unavoidable impurities or residual elements. The invention also relates to a method of producing parts by hot or cold swaging and the parts which can be obtained in this way.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
LIXIN FENG	2010			CN 101736217 A	CAPLUS
MORIMOTO YASUHIDE	2009			JP 2009120942 A	CAPLUS
NOSE KOICHI	2008			EP 1997927 A1	CAPLUS
ZHAO YUNJIE	2013			CN 103045980 A	CAPLUS

IT 1173986-65-6
RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
RN 1173986-65-6 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C22C0021-10 [I]
IPCR C23C0002-12 [I]; C22C0021-10 [I]
CC 56-3 (Nonferrous Metals and Alloys)
ST steel sheet sacrificial cathodically protected coating swaging
IT Anticorrosive coating materials
Coating process
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 12597-69-2, Steel, uses 1173986-65-6
RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)
IT 1832625-87-2
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet provided with sacrificial cathodically protected coating comprising lanthanum)

L13 ANSWER 41 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2015:512917 CAPLUS Full-text
DOCUMENT NUMBER: 162:428426
TITLE: Metal powder for powder-based production processes and method for production of a metallic component from metal powder
INVENTOR(S): Fechte-Heinen, Rainer; Mayer, Stefan; Offergeld, Andreas; Patberg, Lothar; Cott, Andreas
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany
SOURCE: Ger. Offen., 7pp.; Chemical Indexing Equivalent to 162:428425 (WO)
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102013110417	A1	20150326	DE 2013-102013110417	20130920
WO 2015039986	A2	20150326	WO 2014-EP69603	20140915
WO 2015039986	A3	20150827		
EP 3046704	A2	20160727	EP 2014-771830	20140915
PRIORITY APPLN. INFO.:			DE 2013-102013110417 A	20130920
			WO 2014-EP69603 W	20140915

AB The invention relates to metal powder for powder-based prodn. processes wherein a component is structured in layers or as a compact green body from metal powder and is strengthened by welding or sintering. In order that such a metal powder is easily weldable and can be cost-effectively produced, and is thus in particular suitable for fast, economically efficient prodn. of functional components in large quantities in an additive prodn. process (rapid manufg.), the metal powder according to the invention has a particle size distribution in the range of 5 - 150 μm and contains primarily iron and unavoidable impurities, wherein the iron proportion thereof is in the range from 89.6 to 99.9 wt.%. The invention further relates to the use of such a metal powder (steel powder) for powder-based prodn. processes and a method for producing a metallic component through layered structuring and welding or sintering using such a metal powder.
RETABLE

Referenced Author	Year	VOL	PG	Referenced Work	Referenced

(RAU)	(RPY)	(RVL)	(RPG)	(RWK)	File
Anon				DE 10039144 C1	CAPLUS
Anon				WO 2011152774 A1	CAPLUS

IT 1674360-61-2P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(metal powder for powder-based prodn. processes and method for prodn. of metallic component from metal powder)
RN 1674360-61-2 CAPLUS
CN Iron alloy, base, Fe 90-100,Mn 0-3.8,Si 0-1,Cu 0-0.7,Mo 0-0.6,C 0-0.5,Cr 0-0.4,Ni 0-0.4,Ti 0-0.3,Co 0-0.2,Nb 0-0.2,P 0-0.2,V 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	90 - 100	7439-89-6
Mn	0 - 3.8	7439-96-5
Si	0 - 1	7440-21-3
Cu	0 - 0.7	7440-50-8
Mo	0 - 0.6	7439-98-7
C	0 - 0.5	7440-44-0
Cr	0 - 0.4	7440-47-3
Ni	0 - 0.4	7440-02-0
Ti	0 - 0.3	7440-32-6
Co	0 - 0.2	7440-48-4
Nb	0 - 0.2	7440-03-1
P	0 - 0.2	7723-14-0
V	0 - 0.2	7440-62-2
B	0 - 0.1	7440-42-8

IPCI B22F0003-10 [I]
IPCR B22F0003-10 [I]
CC 55-4 (Ferrous Metals and Alloys)
ST steel powder metallurgy sintering welding mech property
IT 1674360-61-2P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(metal powder for powder-based prodn. processes and method for prodn. of metallic component from metal powder)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 42 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2015:512916 CAPLUS Full-text
DOCUMENT NUMBER: 162:428425
TITLE: Metal powder for powder-based production processes and method for production of a metallic component from metal powder
INVENTOR(S): Fechte-Heinen, Rainer; Mayer, Stefan; Offergeld, Andreas; Patberg, Lothar; Cott, Andreas
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe AG, Germany
SOURCE: PCT Int. Appl., 16pp.; Chemical Indexing Equivalent to 162:428426 (DE)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2015039986	A2	20150326	WO 2014-EP69603	20140915
WO 2015039986	A3	20150827		
DE 102013110417	A1	20150326	DE 2013-102013110417	20130920
EP 3046704	A2	20160727	EP 2014-771830	20140915
PRIORITY APPLN. INFO.:			DE 2013-102013110417 A	20130920
			WO 2014-EP69603 W	20140915

AB The invention relates to metal powder for powder-based prodn. processes wherein a component is structured in layers or as a compact green body from metal powder and is strengthened by welding or sintering. In order

that such a metal powder is easily weldable and can be cost-effectively produced, and is thus in particular suitable for fast, economically efficient prodn. of functional components in large quantities in an additive prodn. process (rapid manufg.), the metal powder according to the invention has a particle size distribution in the range of 5 - 150 μm and contains primarily iron and unavoidable impurities, wherein the iron proportion thereof is in the range from 89.6 to 99.9 wt.%. The invention further relates to the use of such a metal powder (steel powder) for powder-based prodn. processes and a method for producing a metallic component through layered structuring and welding or sintering using such a metal powder.

IT 1674360-61-2P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(metal powder for powder-based prodn. processes and method for prodn. of metallic component from metal powder)

RN 1674360-61-2 CAPLUS

CN Iron alloy, base, Fe 90-100,Mn 0-3.8,Si 0-1,Cu 0-0.7,Mo 0-0.6,C 0-0.5,Cr 0-0.4,Ni 0-0.4,Ti 0-0.3,Co 0-0.2,Nb 0-0.2,P 0-0.2,V 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	90 - 100	7439-89-6
Mn	0 - 3.8	7439-96-5
Si	0 - 1	7440-21-3
Cu	0 - 0.7	7440-50-8
Mo	0 - 0.6	7439-98-7
C	0 - 0.5	7440-44-0
Cr	0 - 0.4	7440-47-3
Ni	0 - 0.4	7440-02-0
Ti	0 - 0.3	7440-32-6
Co	0 - 0.2	7440-48-4
Nb	0 - 0.2	7440-03-1
P	0 - 0.2	7723-14-0
V	0 - 0.2	7440-62-2
B	0 - 0.1	7440-42-8

IPCI B22F0007-02 [I]; B22F0007-02 [I]; C22C0033-02 [I]
IPCR B22F0007-02 [I]; C22C0033-02 [I]
CC 55-4 (Ferrous Metals and Alloys)
ST steel powder metallurgy sintering welding mech property
IT 1674360-61-2P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(metal powder for powder-based prodn. processes and method for prodn. of metallic component from metal powder)

L13 ANSWER 43 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2014:2105582 CAPLUS Full-text
DOCUMENT NUMBER: 162:84344
TITLE: Method for hot forming a zinc or zinc alloy coated strip, sheet or blank
INVENTOR(S): Hensen, Guido Cornelis; Verloop, Willem Cornelis; Neelis, Bastiaan Maarten
PATENT ASSIGNEE(S): Tata Steel IJmuiden B.V., Neth.
SOURCE: PCT Int. Appl., 22 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2014198399	A2	20141218	WO 2014-EP1540		20140606
WO 2014198399	A3	20150226			
PRIORITY APPLN. INFO.:			EP 2013-3043	A	20130614
			EP 2013-4166	A	20130823

AB The invention relates to a method for hot forming a strip, sheet or blank coated with a zinc or zinc based alloy layer to form a hot formed

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1336 of 1430

product. According to the invention a no. of specific steps are taken to perform this method within certain limits. The invention also relates to the hot formed product produced using this method.

IT 1639926-81-0
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; method for hot forming zinc or zinc alloy coated strip, sheet or blank)

RN 1639926-81-0 CAPLUS

CN Iron alloy, base, Fe 87-99,Mn 0.5-3.5,W 0-3,Nb 0-2,V 0-2,Cr 0-1,Si 0.1-0.8,C 0.1-0.5,Al 0-0.2,Ti 0-0.2,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	87	-	99	7439-89-6
Mn	0.5	-	3.5	7439-96-5
W	0	-	3	7440-33-7
Nb	0	-	2	7440-03-1
V	0	-	2	7440-62-2
Cr	0	-	1	7440-47-3
Si	0.1	-	0.8	7440-21-3
C	0.1	-	0.5	7440-44-0
Al	0	-	0.2	7429-90-5
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C22F0001-16 [I]; C23C0002-06 [I]; C23C0002-26 [I]; C23C0002-28 [I]; C23C0002-40 [I]; C21D0001-673 [I]; C23C0028-00 [I]

IPCR C23C0002-06 [I]; C21D0001-673 [I]; C23C0002-26 [I]; C23C0002-28 [I]; C23C0002-40 [I]; C23C0028-00 [I]

CC 56-6 (Nonferrous Metals and Alloys)

ST steel zinc alloy anticorrosive coating electroplating

IT Anticorrosive coating materials
Electrodeposition
Mechanical hardness
(method for hot forming zinc or zinc alloy coated strip, sheet or blank)

IT 7440-66-6, Zinc, processes 1273147-93-5, Zinc alloy
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for hot forming zinc or zinc alloy coated strip, sheet or blank)

IT 870820-47-6, 22MnB5 1639926-81-0
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; method for hot forming zinc or zinc alloy coated strip, sheet or blank)

L13 ANSWER 44 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 2014:1754974 CAPLUS Full-text

DOCUMENT NUMBER: 161:584497

TITLE: Product formed by hot forming of metallic coated steel sheet, method to form the product, and steel strip

INVENTOR(S): Chen, Shangping; Hensen, Guido Cornelis

PATENT ASSIGNEE(S): Tata Steel IJmuiden BV, Neth.

SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2014166630	A1	20141016	WO 2014-EP951		20140409
EP 2984198	A1	20160217	EP 2014-716760		20140409
PRIORITY APPLN. INFO.:			EP 2013-1845	A	20130410
			WO 2014-EP951	W	20140409

AB The invention relates to a product formed by hot forming of a metallic coated steel sheet, wherein the formed product has a substrate layer of hot formed steel, a metal affected zone and a diffusion coating

layer on the substrate layer, and optionally a metal oxide layer on the diffusion coating layer. According to the disclosure, a low carbon zone is present between the substrate layer and the metal affected zone. The invention also relates to a method for producing a metallic coated hot formed product, and to a steel strip to be used in the method.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
ABE MASAYUKI	2012			US 20120006451 A1	
HENSEN GUIDO CORNELIS	2010			WO 2010069588 A1	CAPLUS
HIRAMATSU TERUSHI	2001			JP 2001064751 A	CAPLUS
KATAGIRI YUKIO	2011			JP 2011208164 A	CAPLUS
Karbasian, H	2010	210	2103	Journal Of Materials	CAPLUS
NAKAMURA NOBUYUKI	2009			EP 2053139 A1	CAPLUS
PUERTA VELASQUEZ JUAN D	2014			WO 2014037627 A1	CAPLUS

IT 1630724-35-4
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(substrate; product formed by hot forming of metallic coated steel sheet, method to form the product, and steel strip)

RN 1630724-35-4 CAPLUS

CN Iron alloy, base, Fe 87-99,Mn 0.5-3,W 0-3,Nb 0-2,V 0-2,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Al 0-0.2,Ti 0-0.2,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	87 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
W	0 - 3	7440-33-7
Nb	0 - 2	7440-03-1
V	0 - 2	7440-62-2
Cr	0 - 1	7440-47-3
C	0.1 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Al	0 - 0.2	7429-90-5
Ti	0 - 0.2	7440-32-6
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

IPCI C22C0038-00 [I]; C21D0001-00 [I]
IPCR C22C0038-00 [I]; C21D0001-00 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet strip hot dip metal anticorrosive coating
IT Anticorrosive coating materials
Hot-dip coating process
(product formed by hot forming of metallic coated steel sheet, method to form the product, and steel strip)
IT 39308-06-0D, iron 0.011. 1630724-36-5 1630724-38-7
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(anticorrosive coating; product formed by hot forming of metallic coated steel sheet, method to form the product, and steel strip)
IT 870820-47-6, 22MnB5 1630724-35-4
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(substrate; product formed by hot forming of metallic coated steel sheet, method to form the product, and steel strip)
OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

L13 ANSWER 45 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2014:755736 CAPLUS Full-text
DOCUMENT NUMBER: 160:679480
TITLE: Steel sheets for hot pressing, hot pressed steel

members, and method for manufacture of the members
INVENTOR(S): Miyoshi, Tatsuya; Nakajima, Seiji; Ando, Satoru
PATENT ASSIGNEE(S): JFE Steel Corporation, Japan
SOURCE: PCT Int. Appl., 29pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2014068939	A1	20140508	WO 2013-JP6347	20131028
KR 2015052266	A	20150513	KR 2015-7008668	20131028
KR 1731740	B1	20170428		
CN 104755655	A	20150701	CN 2013-80056511	20131028
CN 104755655	B	20170922		
EP 2915904	A1	20150909	EP 2013-850861	20131028
EP 2915904	B1	20190612		
JP 5888430	B2	20160322	JP 2014-544298	20131028
IN 2015DN02108	A	20150814	IN 2015-DN2108	20150316
IN 302263	B	20181026		
US 20150337415	A1	20151126	US 2015-14438993	20150428
US 10030290	B2	20180724		

PRIORITY APPLN. INFO.: JP 2012-239973 A 20121031
WO 2013-JP6347 W 20131028
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Base steel sheet equipped with galvanized layer and a layer, contg. polysiloxanes having C≥4 functional group, formed in the order is claimed. Preferably, the steel sheet consists of C 0.15-0.5, Si 0.05-2.0, Mn 0.5-3, P ≤0.1, S ≤0.05, Al ≤0.10, N ≤0.010, optionally Cr 0.01-1, Ti ≤0.20, B 0.0005-0.08, and/or Sb 0.003-0.03 wt.%, and balance Fe; the galvanized layer comprises a 0.01-5 g/m2 1st layer of ≥60 wt.% Ni and balance Zn and a 10-90 g/m2 2nd layer of 10-25 wt.% Ni and balance Zn; and the polysiloxane layer also contains less wt. parts (polysiloxane basis) silane coupling agents. Also claimed is the hot pressed member of the given steel having a surface characterized by a ≥0.20 kcps x-ray diffractometry peak for Zn2SiO4 at 2θ = 36.1°. The member is manufd. by heating the sheet to a temp. between Ac3 and 1000°, e.g. at av. heating rate of ≥100°/s, followed by its hot pressing. The members are resistant to pit and crevice corrosion even when used under severe conditions and are esp. suitable for use in automobiles.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2012			JP 4883240 B1	CAPLUS
KUZE YUKINOBU	2011			WO 2011070859 A1	CAPLUS
SAITO TAKASHI	2007			JP 2007063578 A	CAPLUS
YANO HIROKAZU	2007			JP 2007246775 A	CAPLUS

IT 1609017-11-9D, Sb(0.003-0.03)
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
RN 1609017-11-9 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0.2,Al 0.1,P 0.1,B 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	93 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Ti	0.2	7440-32-6
Al	0.1	7429-90-5
P	0.1	7723-14-0
B	0 - 0.1	7440-42-8

IPCI C23C0028-00 [I]; B21D0022-20 [I]; B32B0015-08 [I]; C21D0001-18 [I];
C21D0009-00 [I]; C22C0018-00 [I]; C22C0019-03 [I]; C22C0038-00 [I];
C22C0038-60 [I]; C25D0005-26 [I]
IPCR C23C0028-00 [I]; B21D0022-20 [I]; B32B0015-08 [I]; C21D0001-18 [I];
C21D0009-00 [I]; C22C0018-00 [I]; C22C0019-03 [I]; C22C0038-00 [I];
C22C0038-60 [I]; C25D0005-26 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 42, 56
ST hot pressing steel sheet corrosion resistant; polysiloxane coated galvanized steel hot pressing; nickel zinc alloy underlayer silicone coated steel
IT Polysiloxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(C>4 group-contg., coating on galvanized steel; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Polysiloxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(Me Ph, KR-311; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Silanes
RL: MOA (Modifier or additive use); USES (Uses)
(coupling agent, in silicone layer; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Polysiloxanes
RL: TEM (Technical or engineered material use); USES (Uses)
(epoxy, ES-1001N; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Epoxy resins
RL: TEM (Technical or engineered material use); USES (Uses)
(polysiloxane-, ES-1001N; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Metalworking
(pressing; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Coupling agents
(silane, in silicone layer; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Corrosion-resistant materials
Hot-press molding
(steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT Galvanized steel
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT 919-30-2, KBE 903 2602-34-8, KBE 403
RL: MOA (Modifier or additive use); USES (Uses)
(coupling agent, in silicone layer; steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT 13597-65-4P, Zinc silicate (Zn2SiO4)
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(steel sheets having nickel-zinc alloy and polysiloxane coatings for prepn. of hot pressed members showing excellent corrosion resistance)
IT 7440-36-0D, Antimony, trace in alloys 238084-01-0 1379822-01-1
1609017-10-8 1609017-11-9D, Sb(0.003-0.03)
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheets having nickel-zinc alloy and polysiloxane

coatings for prepn. of hot pressed members showing excellent corrosion resistance)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 46 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2014:451007 CAPLUS Full-text
DOCUMENT NUMBER: 160:475772
TITLE: Compression coil springs and their manufacture including coiling process in austenite temperature region
INVENTOR(S): Ono, Yuitirou; Shiraishi, Tohru; Ono, Yoshiki; Takahashi, Keita
PATENT ASSIGNEE(S): NHK Spring Co., Ltd., Japan
SOURCE: PCT Int. Appl., 50pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2014042066	A1	20140320	WO 2013-JP73937	20130905
JP 5361098	B1	20131204	JP 2012-202416	20120914
JP 2014055343	A	20140327		
CN 104619878	A	20150513	CN 2013-80047783	20130905
CN 104619878	B	20161116		
KR 2015054969	A	20150520	KR 2015-7009184	20130905
KR 2191407	B1	20201215		
EP 2896712	A1	20150722	EP 2013-837663	20130905
EP 2896712	B1	20190807		
KR 2020010619	A	20200130	KR 2020-7002286	20130905
US 20150252863	A1	20150910	US 2015-14427106	20150310
US 9752636	B2	20170905		
IN 2015KN00953	A	20151225	IN 2015-KN953	20150407

PRIORITY APPLN. INFO.:

JP 2012-202416	A	20120914
KR 2015-7009184	A3	20130905
WO 2013-JP73937	W	20130905

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The coil springs comprise steel wires with equiv. circle diam. 2.5-10 mm contg. C 0.45-0.80, Si 0.15-2.50, Mn 0.3-1.0 wt.%, and Fe balance, wherein (i) arbitrary cross-sections of the wires show core hardness 570-700HV, (ii) the wires have surface layers with higher-than-av. concn. of C, and (iii) the wires show compressive residual stress ≥200 MPa and ≥60 MPa at 0.2 mm-depth and 0.4 mm-depth from the surfaces, resp. along the max. principal stress direction under application of compressive load in the inner diam. side of the coil springs. Also claimed are coil springs using steel wires contg. C 0.45-0.80, Si 0.15-2.50, Mn 0.3-1.0, and Cr, B, Ni, Ti, Cu, Nb, V, Mo, and/or W 0.005-4.5 wt.%. The manufg. method, using coil spring forming app. equipped with feed rollers, coiling parts having wire guides, coiling tools, and pitch tools, cutting means, and heating means for raising temp. to austenite region within 2.5 s between the feed roller exits to the coiling tools, includes coiling steel wires by hot forming, cutting, quenching the formed coils still at temp. in austenite region, tempering, shot-peening, setting in this order, and carburizing (between heating and quenching processes) by directly spraying hydrocarbon gas on the wire surfaces. The coil springs with excellent fatigue resistance are esp. useful as automotive valve springs and clutch torsion springs.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1981			JP 56152921 A	
Anon	1989			JP 01177318 A	CAPLUS
Anon	1992			JP 499126 A	
Anon	1993			JP 586418 A	
Anon	2012			JP 5064590 B1	CAPLUS
HONDA YOSHINORI	2001			JP 2001082518 A	CAPLUS
KONDO SATORU	2000			JP 2000326036 A	CAPLUS
MORITA TOSHIYUKI	2008			JP 2008045178 A	CAPLUS

NISSAN MOTOR |2012 | | |JP 2012077367 A |CAPLUS
IT 1581259-99-5
RL: TEM (Technical or engineered material use); USES (Uses)
(manuf. of compression coil springs including coiling process in austenite temp. region)
RN 1581259-99-5 CAPLUS
CN Iron alloy, base, Fe 91-99,B 0-4.5,Cr 0-4.5,Cu 0-4.5,Mo 0-4.5,Nb 0-4.5,Ni 0-4.5,Ti 0-4.5,V 0-4.5,W 0-4.5,Si 0.2-2.5,Mn 0.3-1,C 0.4-0.8 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	91	-	99	7439-89-6
B	0	-	4.5	7440-42-8
Cr	0	-	4.5	7440-47-3
Cu	0	-	4.5	7440-50-8
Mo	0	-	4.5	7439-98-7
Nb	0	-	4.5	7440-03-1
Ni	0	-	4.5	7440-02-0
Ti	0	-	4.5	7440-32-6
V	0	-	4.5	7440-62-2
W	0	-	4.5	7440-33-7
Si	0.2	-	2.5	7440-21-3
Mn	0.3	-	1	7439-96-5
C	0.4	-	0.8	7440-44-0

IPCI C22C0038-00 [I]; B21F0003-02 [I]; B21F0035-00 [I]; B24C0001-10 [I]; B24C0011-00 [I]; C21D0001-06 [I]; C21D0007-06 [I]; C21D0008-06 [I]; C21D0009-02 [I]; C22C0038-04 [I]; C22C0038-54 [I]; C23C0008-22 [I]; C23C0008-80 [I]; F16F0001-06 [I]
IPCR C22C0038-00 [I]; B21F0003-02 [I]; B21F0035-00 [I]; B24C0001-10 [I]; B24C0011-00 [I]; C21D0001-06 [I]; C21D0007-06 [I]; C21D0008-06 [I]; C21D0009-02 [I]; C22C0038-04 [I]; C22C0038-54 [I]; C23C0008-22 [I]; C23C0008-80 [I]; F16F0001-06 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST compression coil spring manuf austenite temp region coiling; steel wire heating quenching tempering shot peening carburizing
IT 1581259-99-5
RL: TEM (Technical or engineered material use); USES (Uses)
(manuf. of compression coil springs including coiling process in austenite temp. region)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 47 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2014:174777 CAPLUS Full-text
DOCUMENT NUMBER: 160:297675
TITLE: Hot-dip galvanized steel sheet and manufacturing method therefor
INVENTOR(S): Fujita, Soshi; Yamanaka, Shintaro
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 58pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2014021452	A1	20140206	WO 2013-JP71004	20130802
JP 5648755	B2	20150107	JP 2013-551091	20130802
KR 2015036681	A	20150407	KR 2015-7004127	20130802
KR 1653510	B1	20160901		
CN 104508169	A	20150408	CN 2013-80040033	20130802
CN 104508169	B	20170222		
TW I488978	B	20150621	TW 2013-127806	20130802
BR 112015001809	A2	20170704	BR 2015-112015001809	20130802
BR 112015001809	B1	20201110		
MX 2015001224	A	20150410	MX 2015-1224	20150127
MX 370268	B	20191209		

US 20150225829 A1 20150813 US 2015-14418852 20150130
US 10131981 B2 20181120
IN 2015DN01525 A 20150703 IN 2015-DN1525 20150224
PRIORITY APPLN. INFO.: JP 2012-172739 A 20120803
WO 2013-JP71004 W 20130802
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The present invention provides a hot-dip galvanized steel sheet having excellent plating wettability and plating adhesion even when the base steel sheet contains Si and Mn, and provides a manufg. method therefor. The galvanized steel sheet pertaining to the present invention includes a base steel sheet contg. Si, Mn, and other predetd. components, and a galvanized layer formed on at least one surface of the base steel sheet. The base steel sheet has an HA value and an HB that satisfy all of the following relational expressions, wherein HA is the av. hardness of the surface layer that extends to a depth of 50 μm from the interface between the base steel sheet and the galvanized layer, and HB is the av. hardness of deep portions in excess of 50 μm from the interface. 50 ≤ HA ≤ 500 ... (1) 50 ≤ HB ≤ 500 ... (2) 0.5 ≤ HA/HB ≤ 0.9 ... (3). The galvanized steel sheet is manufd. by hot-dip galvanizing of a base steel sheet which is processed by annealing and soaking in controlled conditions (details described).
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1999			JP 11343551 A	CAPLUS
MIYATA MAI	2010			JP 2010132975 A	CAPLUS

IT 1428957-53-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(base steel sheet; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
RN 1428957-53-2 CAPLUS
CN Iron alloy, base, Fe 78-99,Mn 0.5-5,Si 0.1-3,Al 0-1,B 0-1,Ca 0-1,Cr 0-1,Cu 0-1,misch metal 0-1,Mo 0-1,Nb 0-1,Ni 0-1,Ti 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.5,P 0-0.5 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	78	-	99	7439-89-6
Mn	0.5	-	5	7439-96-5
Si	0.1	-	3	7440-21-3
Al	0	-	1	7429-90-5
B	0	-	1	7440-42-8
Ca	0	-	1	7440-70-2
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Misch metal	0	-	1	8049-20-5
Mo	0	-	1	7439-98-7
Nb	0	-	1	7440-03-1
Ni	0	-	1	7440-02-0
Ti	0	-	1	7440-32-6
V	0	-	1	7440-62-2
W	0	-	1	7440-33-7
Zr	0	-	1	7440-67-7
C	0	-	0.5	7440-44-0
P	0	-	0.5	7723-14-0

IPCI C23C0002-06 [I]; C21D0009-46 [I]; C22C0018-00 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C23C0002-02 [I]; C23C0002-28 [I]
IPCR C23C0002-06 [I]; C21D0009-46 [I]; C22C0018-00 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C23C0002-02 [I]; C23C0002-28 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST hot dip galvanized steel base silicon manganese wettability adhesion; steel annealing soaking hot dip galvanizing base sheet hardness
IT Galvanized steel
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(hot-dip; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and

plating adhesion)
IT Alloying
Annealing
Hot-dip galvanizing
(manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
IT Heat treatment
(soaking; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(annealing atm.; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
IT 7440-45-1D, Cerium, trace in alloy 12709-15-8D, Ce 0.02%, P 0.010%, Al 0.04%, processes 144920-07-0D, Ce 0.02%, P 0.019%, Al 0.05%, processes 1428957-53-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(base steel sheet; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
IT 53881-87-1 109581-27-3 109581-29-5 723302-58-7 763111-21-3 1242002-97-6 1554190-57-6 1554190-62-3 1554190-66-7 1554190-71-4 1554190-72-5 1554190-73-6 1554190-78-1 1554190-82-7 1554190-84-9 1554190-88-3 1554190-90-7 1554190-95-2 1554190-99-6 1554191-01-3 1554191-06-8 1554191-11-5 1554191-14-8 1554191-17-1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(galvanizing layer; manuf. of hot-dip galvanized steel sheet contg. Si and Mn in base steel sheet and showing good wettability and plating adhesion)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 48 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:1659555 CAPLUS Full-text
DOCUMENT NUMBER: 159:643708
TITLE: Steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for production of a part using the sheet
INVENTOR(S): Allely, Christian; Chassagne, Julie; Corlu, Beril
PATENT ASSIGNEE(S): ArcelorMittal Investigacion y Desarrollo SL, Spain
SOURCE: PCT Int. Appl., 26pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2013156688	A1	20131024	WO 2012-FR149	20120417
CA 2870532	A1	20131024	CA 2012-2870532	20120417
CA 2870532	C	20161213		
AU 2012377741	A1	20141204	AU 2012-377741	20120417
AU 2012377741	B2	20160317		
CN 104302802	A	20150121	CN 2012-80073231	20120417
CN 104302802	B	20170412		
KR 2015008114	A	20150121	KR 2014-7032019	20120417
KR 1667131	B1	20161017		
EP 2839049	A1	20150225	EP 2012-722750	20120417
EP 2839049	B1	20171018		
MX 2014012626	A	20150511	MX 2014-12626	20120417
MX 358552	B	20180823		
JP 2015520797	T	20150723	JP 2015-506274	20120417
JP 6348105	B2	20180627		
KR 2016114735	A	20161005	KR 2016-7026204	20120417

ES 2652028	T3	20180131	ES 2012-722750		20120417
KR 2018017229	A	20180220	KR 2018-7003561		20120417
KR 1886611	B1	20180809			
EA 30016	B1	20180629	EA 2014-1136		20120417
BR 112014025697	B1	20201020	BR 2014-112014025697		20120417
ZA 2014007327	A	20170830	ZA 2014-7327		20141009
IN 2014CN07902	A	20160701	IN 2014-CN7902		20141028
US 20150284861	A1	20151008	US 2015-14394885		20150617
US 10253418	B2	20190409			

PRIORITY APPLN. INFO.:

KR 2014-7032019	A3	20120417
KR 2016-7026204	A3	20120417
WO 2012-FR149	W	20120417

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention relates to a steel sheet provided with a coating offering sacrificial cathodic protection, comprising, wt.%: Zn 5-50, Si 0.1- 15, and optionally Mg up to 10 and up to 0.3 in terms of total content, of addnl. elements, as well as comprising a protective element selected from Sn 0.1-5, In 0.01-0.5 and combinations of same, the remainder consisting of Al. The invention also relates to a method for producing parts by hot or cold pressing and to the resulting parts.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
NIPPON STEEL CORP	2002			EP 1225246 A1	CAPLUS
POSCO	2009			US 20090238715 A1	
THYSSENKRUPP STEEL EURO	2011			WO 2011157690 A1	CAPLUS

IT 1173986-65-6

RL: NUU (Other use, unclassified); USES (Uses)
(steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for prodn. of part using the sheet)

RN 1173986-65-6 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Cu	0 - 0.1	7440-50-8
Ni	0 - 0.1	7440-02-0
P	0 - 0.1	7723-14-0

IPCI C23C0002-04 [I]; C23C0002-12 [I]; C23C0002-28 [I]; C21D0001-673 [I]; C21D0008-02 [I]

IPCR C23C0002-04 [I]; C21D0001-673 [I]; C21D0008-02 [I]; C23C0002-12 [I]; C23C0002-28 [I]

CC 56-3 (Nonferrous Metals and Alloys)

ST steel anticorrosive coating cathodic protection aluminum zinc silicon alloy

IT Anticorrosive coating materials
Cathodic protection
(steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for prodn. of part using the sheet)

IT 1469993-24-5 1469993-25-6 1469993-26-7 1469993-27-8 1469993-28-9 1469993-29-0 1469993-30-3

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coating; steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for prodn. of part using the sheet)

IT 1173986-65-6

RL: NUU (Other use, unclassified); USES (Uses)

(steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for prodn. of part using the sheet)
IT 12597-69-2, Steel, uses 870820-47-6, 22MnB5
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; steel sheet provided with Al-Zn-Si base anticorrosive coating offering sacrificial cathodic protection, method for prodn. of part using the sheet)
OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

L13 ANSWER 49 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:1612663 CAPLUS Full-text
DOCUMENT NUMBER: 161:113844
TITLE: Result prediction of steel carbonization when carbonitriding
AUTHOR(S): Gliner, R. E.; Vybornov, V. V.; Pryanichnikov, V. A.
CORPORATE SOURCE: Nizhegorodskii Gosudarstvennyi Tekhnicheskii Universitet, Nizhny Novgorod, Russia
SOURCE: Tekhnologiya Metallov (2013), (4), 8-14
CODEN: TMEEAL; ISSN: 1684-2499
PUBLISHER: OOO "Nauka i Tekhnologii"
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The features of the steel during carburizing carbonitriding to the coeffs. of absorption and diffusion of carbon. Revealed that complete satn. of carbon and nitrogen results in a significant acceleration of the absorption of carbon and, correspondingly, the speed of the carburizing. The possibility of harmonization of different carburizing alloy steels.
IT 56995-50-7, 20KhGR
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(result prediction of steel carburization during carbonitriding)
RN 56995-50-7 CAPLUS
CN Iron alloy, base, Fe 96-98,Cr 0.75-1.05,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,Ni 0-0.30,C 0.18-0.24,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Cr	0.75	-	1.05	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
Ni	0	-	0.30	7440-02-0
C	0.18	-	0.24	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST carbonitriding steel carburization prediction
IT Absorptivity
Carbonitriding
Composition
Diffusion
Diffusion coating process
(result prediction of steel carburization during carbonitriding)
IT 74-82-8, Methane, uses 7664-41-7, Ammonia, uses
RL: NUU (Other use, unclassified); USES (Uses)
(result prediction of steel carburization during carbonitriding)
IT 39467-50-0, 20KhGNM, processes 56995-50-7, 20KhGR

71390-26-6, 07Kh3GNM 578731-16-5, 20Kh3N3MFBA
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(result prediction of steel carburization during carbonitriding)

L13 ANSWER 50 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:1460865 CAPLUS Full-text
DOCUMENT NUMBER: 159:503793
TITLE: Hot-pressed zinc-nickel alloy-coated steel article and its manufacture
INVENTOR(S): Nakajima, Seiji; Miyoshi, Tatsuya; Ando, Satoru
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2013185184	A	20130919	JP 2012-49868	20120307

PRIORITY APPLN. INFO.: JP 2012-49868 20120307

AB The hot-pressed article has a plating layer satisfying total deposition of Zn and Ni 5-90 g/m2 and Ni deposition ratio based on the total deposition 10-25 wt.% on a steel sheet surface and comprises high-strength parts having tensile strength ≥1000 MPa and low-strength parts having tensile strength <1000 Pa. The article is manufd. by heating a steel sheet contg. C 0.15-0.5, Si 0.05-2.0, Mn 0.5-3, P ≤0.1, S ≤0.05, Al ≤0.1, and N ≤0.01 wt.% coated with 5-90 g/m2 of Zn-(10-25 wt.%) Ni alloy to have coexistence of high-temp. parts at ≥ Ac3 transformation point and ≤1000° and low-temp. parts at ≥0° and < Ac3 transformation point and then starting hot-pressing when the high-temp. parts become 600-800°. The article has excellent resistance to corrosion and chipping after coating and is suitable for automotive parts.

IT 1356847-15-8D, Sb(0.003-0.03%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(hot-pressed zinc-nickel alloy-coated steel article having high-strength parts and low-strength parts and its manuf. by heating coated steel sheet and hot-pressing)
RN 1356847-15-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C25D0005-26 [I]; C22C0038-00 [I]; C21D0009-00 [I]; C22C0038-60 [I]; C21D0001-18 [I]
IPCR C25D0005-26 [I]; C21D0001-18 [I]; C21D0009-00 [I]; C22C0038-00 [I]; C22C0038-60 [I]
CC 55-11 (Ferrous Metals and Alloys)
ST zinc nickel alloy coated steel heating hot pressing
IT Heat treatment
Hot-press molding
Metal forming
(hot-pressed zinc-nickel alloy-coated steel article having high-strength parts and low-strength parts and its manuf. by heating coated steel sheet and hot-pressing)

IT 7440-36-0D, Antimony, trace in alloy 238084-01-0 1299468-35-1
1356847-15-8D, Sb(0.003-0.03%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(hot-pressed zinc-nickel alloy-coated steel article having high-strength parts and low-strength parts and its manuf. by heating coated steel sheet and hot-pressing)
IT 1379822-01-1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(primer; hot-pressed zinc-nickel alloy-coated steel article having high-strength parts and low-strength parts and its manuf. by heating coated steel sheet and hot-pressing)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 51 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:650770 CAPLUS Full-text
DOCUMENT NUMBER: 158:624577
TITLE: Anti-scale and anti-corrosion hybrid coatings for steel substrates
INVENTOR(S): Gordon, Douglas Jesus Figueroa; Harding, Tim; Boehm, Sivasambu; Li, Wu; Weirman, Chris
PATENT ASSIGNEE(S): Tata Steel UK Limited, UK
SOURCE: PCT Int. Appl., 15pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2013056847	A1	20130425	WO 2012-EP4384	20121019
PRIORITY APPLN. INFO.:			EP 2011-8421 A	20111019

AB Method of producing a coated steel substrate suitable for hot-forming or other high temp. applications, which comprises the steps of: (i) providing a steel substrate; (ii) prepg. a coating mixt. comprising a curable org. component as a first binder, a curable inorg. component as a second binder, a cross- linking component to chem. cross-link the curable org. component and the curable inorg. component, and a metal or metal alloy particle having an aluminum content of at least 50% and a balance of 50% or less of a non-aluminum metal; (iii) applying the mixt. on the steel substrate; (iv) curing the mixt. to produce a dense network structure of the coating on the steel substrate.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Cornelis, V	2010			WO 2010069588 A1	CAPLUS
Foscante Raymond E	1981			US 4250074 A	CAPLUS
Gen Electric	2007			WO 2007067203 A1	CAPLUS
Harding, T	2011			WO 2011069663 A2	CAPLUS
Savin Ronald Richard	1990			EP 0385880 A2	CAPLUS
Standke Burkhard	2010			US 20100159144 A1	

IT 1431293-40-1, Aluminum 0-0.1, boron 0-0.1, carbon 0.2-0.5, chromium 0-1, iron 92-99, manganese 0.5-3, molybdenum 0-0.5, niobium 0-0.1, phosphorus 0-0.1, silicon 0.1-2.5, titanium 0-0.2, vanadium 0-0.1
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(antiscale and anticorrosion hybrid coatings for steel substrates)
RN 1431293-40-1 CAPLUS
CN Iron alloy, base, Fe 92-99,Mn 0.5-3,Si 0.1-2.5,Cr 0-1,C 0.2-0.5,Mo 0-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5

Si	0.1	-	2.5	7440-21-3
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Mo	0	-	0.5	7439-98-7
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0
V	0	-	0.1	7440-62-2

IPCI C21D0001-68 [I]; C23C0018-02 [I]; C09D0007-12 [I]; C09D0005-10 [I]; C09D0201-10 [I]; C09D0175-04 [I]; C09D0183-04 [I]
IPCR C21D0001-68 [I]; C09D0005-10 [I]; C09D0007-12 [I]; C09D0175-04 [I]; C09D0183-04 [I]; C09D0201-10 [I]; C23C0018-02 [I]
CC 55-6 (Ferrous Metals and Alloys)
ST antiscale anticorrosion hybrid coating steel
IT Anticorrosive coating materials
Antiscaling coating materials
Binders
(antiscale and anticorrosion hybrid coatings for steel substrates)
IT Epoxy resins
Organic compounds
Silanes
RL: NUU (Other use, unclassified); USES (Uses)
(antiscale and anticorrosion hybrid coatings for steel substrates)
IT Polyurethanes
RL: NUU (Other use, unclassified); USES (Uses)
(polyester-; antiscale and anticorrosion hybrid coatings for steel substrates)
IT Polyesters
RL: NUU (Other use, unclassified); USES (Uses)
(polyurethane-; antiscale and anticorrosion hybrid coatings for steel substrates)
IT 108-78-1, 1,3,5-Triazine-2,4,6-triamine, uses 661-20-1, Isocyanate 10344-93-1, Acrylate, uses
RL: NUU (Other use, unclassified); USES (Uses)
(antiscale and anticorrosion hybrid coatings for steel substrates)
IT 1273096-81-3, Aluminum alloy 1431293-40-1, Aluminum 0-0.1, boron 0-0.1, carbon 0.2-0.5, chromium 0-1, iron 92-99, manganese 0.5-3, molybdenum 0-0.5, niobium 0-0.1, phosphorus 0-0.1, silicon 0.1-2.5, titanium 0-0.2, vanadium 0-0.1
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(antiscale and anticorrosion hybrid coatings for steel substrates)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 52 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:640308 CAPLUS Full-text
DOCUMENT NUMBER: 158:593876
TITLE: High-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manufacture
INVENTOR(S): Okamoto, Isamu; Oka, Masaharu; Wakabayashi, Chisato; Azuma, Masafumi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 24 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2013076137	A	20130425	JP 2011-217619	20110930
JP 5953693	B2	20160720		

PRIORITY APPLN. INFO.: JP 2011-217619 20110930

AB The galvanized steel sheet has a steel substrate contg. C 0.05-0.4, Si 0.01-3.0, Mn 0.1-3.0, P ≤0.04, S ≤0.05, N ≤0.01, Al 0.01-2.0, and Si + Al >0.5 wt.% while having microstructure contg. ≥40 vol.% of ferrite main phase, ≥8 vol.% of retained austenite, 3 kinds of martensite defined by using C content and hardness, and 10-0 vol.% of pearlite, (1) a hot-dip galvanized layer contg. <7 wt.% Fe and residual amts. of Zn and Al or (2) a hot-dip galvannealed layer contg. 7-15 wt.% Fe and residual amts. of Zn and Alon the substrate, and tensile strength ≥980 MPa. The galvanized steel sheet is manufd. by heating a cast slab at ≥1100° directly or after cooling, final hot-rolling at ≥Ar3 transformation point, winding at ≤700°, pickling, cold-rolling at draft 40-70%, annealing at 730-900°, primary-cooling to 600-750° at rate 0.1-20°/s while satisfying (A) annealing temp. ≥730 and <800°, (B) primary cooling stopping temp. ≥600 and <700°, and/or (C) primary cooling av. rate 0.1-5.0°/s, cooling to ≤450° at rate ≥20°/s, holding at 350-450° for ≥120 s, cooling, grinding the surface layer in thickness ≥0.1 μm for removal, preplating with 0.2-2.0 g/m2 of Ni, heating at rate ≥10°/s to [(galvanizing bath temp.) - 40]° to [(galvanizing bath temp.) + 50]°, galvanizing, and optionally heat-alloying at 470-600° for 10-40 s.

IT 1430730-21-4D, Ca(0.0005-0.01%) Mg(0.0005-0.01%) rare earth metal(0.0005-0.01%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)

RN 1430730-21-4 CAPLUS

CN Iron alloy, base, Fe 80-99,Mn 0.1-3,Cr 0-3,Cu 0-3,Ni 0-3,Si 0-3,Al 0-2,Mo 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	99	7439-89-6
Mn	0.1	-	3	7439-96-5
Cr	0	-	3	7440-47-3
Cu	0	-	3	7440-50-8
Ni	0	-	3	7440-02-0
Si	0	-	3	7440-21-3
Al	0	-	2	7429-90-5
Mo	0	-	1	7439-98-7
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C23C0002-06 [I]; C23C0002-28 [I]; C23C0002-40 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C23C0002-06 [I]; C23C0002-28 [I]; C23C0002-40 [I]

IPCR C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-60 [I]; C23C0002-06 [I]; C23C0002-28 [I]; C23C0002-40 [I]

CC 55-6 (Ferrous Metals and Alloys)

ST hot dip galvanized steel sheet manuf plating adhesion formability

IT Annealing
Cold rolling
Cooling
Galvannealing
Grinding (machining)
Hot rolling
Hot-dip galvanizing
(high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)

IT Rare earth metals
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(trace in alloy, substrate; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)

IT 1431127-89-7
RL: TEM (Technical or engineered material use); USES (Uses)
(galvanized layer; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
IT 1430730-23-6
RL: TEM (Technical or engineered material use); USES (Uses)
(galvannealed layer; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
IT 7440-02-0, Nickel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(precoating with; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
IT 12244-31-4, Austenite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(retained, steel substrate microstructure component; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
IT 12173-93-2, Martensite, uses 12427-24-6, Ferrite (ferrous metal component) 12427-27-9, Pearlite
RL: TEM (Technical or engineered material use); USES (Uses)
(steel substrate microstructure component; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
IT 7439-95-4D, Magnesium, trace in alloy 7440-70-2D, Calcium, trace in alloy 1430730-20-3 1430730-21-4D, Ca(0.0005-0.01%) Mg(0.0005-0.01%) rare earth metal(0.0005-0.01%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; high-strength hot-dip galvanized steel sheet with excellent plating adhesion and formability and its manuf.)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 53 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:637081 CAPLUS Full-text
DOCUMENT NUMBER: 158:608421
TITLE: Hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manufacture
INVENTOR(S): Wakabayashi, Chisato; Azuma, Masafumi; Okamoto, Riki; Fujita, Nobuhiro; Takahashi, Manabu
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2013076148	A	20130425	JP 2011-217995	20110930
JP 5699889	B2	20150415		

PRIORITY APPLN. INFO.: JP 2011-217995 20110930
AB The galvanized steel sheet has a steel substrate contg. C 0.05-0.4, Si 0.01-3.0, Mn 0.1-3.0, P ≤0.04, S ≤0.05, N ≤0.01, Al 0.01-2.0, and Si + Al >0.5 wt.% while having microstructure contg. ≥40 vol.% total of main phase consisting of ≥1 kind of martensite selected from 3 kinds defined by using C content including cementite and hardness and bainite, ≥8 vol.% of austenite, ≤10 vol.% of pearlite, and a residual amt. of ferrite, (1) a hot-dip galvanized layer contg. <7 wt.% Fe and residual amts. of Zn and Al or (2) a hot-dip galvannealed layer contg. 7-15 wt.% Fe and residual amts. of Zn and Al on the substrate, and tensile strength ≥980 MPa. The galvanized steel sheet is manufd. by heating a cast slab at ≥1200° directly or after cooling, final hot-rolling at ≥Ar3 transformation point, winding at ≤700°, pickling, cold-rolling at draft 40-70%, annealing at 730-900°, primary-cooling to 650-750° at rate 0.1-50°/s, cooling to ≤450° at rate ≥20°/s, holding at 350-450° for ≥120 s, cooling, pickling, grinding the surface

layer in thickness ≥0.1 μm for removal, preplating with 0.2-2.0 g/m2 of Ni, heating at rate ≥10°/s to [(galvanizing bath temp.) - 40]° to [(galvanizing bath temp.) + 50]°, galvanizing by dipping in a bath flowing at flow rate 10-50 m/min, and optionally heat-alloying at 470-600° for 10-40 s. The galvanized sheet shows good ductility and hole-expanding property.

IT 1431057-05-4D, Ca(0.0005-0.01%) Mg(0.0005-0.01%) rare earth metal(0.0005-0.01%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

RN 1431057-05-4 CAPLUS

CN Iron alloy, base, Fe 86-100,Mn 0.1-3,Si 0-3,Al 0-2,Cr 0-1,Cu 0-1,Mo 0-1,Ni 0-1,V 0-0.5,C 0-0.4,Nb 0-0.3,Ti 0-0.3,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	86	-	100	7439-89-6
Mn	0.1	-	3	7439-96-5
Si	0	-	3	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Mo	0	-	1	7439-98-7
Ni	0	-	1	7440-02-0
V	0	-	0.5	7440-62-2
C	0	-	0.4	7440-44-0
Nb	0	-	0.3	7440-03-1
Ti	0	-	0.3	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C22C0018-00 [I]; B21B0003-00 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C23C0002-02 [I]; C23C0002-28 [I]; C22C0038-00 [I]; C22C0038-60 [I]; C21D0009-46 [I]; C22C0018-00 [I]; B21B0003-00 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C23C0002-02 [I]; C23C0002-28 [I]

IPCR C22C0038-00 [I]; B21B0003-00 [I]; C21D0009-46 [I]; C22C0018-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C23C0002-02 [I]; C23C0002-06 [I]; C23C0002-28 [I]; C23C0002-40 [I]; C22C0038-60 [I]

CC 55-6 (Ferrous Metals and Alloys)

ST hot dip galvanized steel sheet manuf tensile strength formability

IT Annealing
Cold rolling
Cooling
Galvannealing
Grinding (machining)
Hot rolling
Hot-dip galvanizing
Pickling
(hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

IT Recrystallization
(texture; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

IT Rare earth metals
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(trace in alloy, substrate; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

IT 1431127-89-7, (Aluminum + zinc) 93-100, iron 0-7
RL: TEM (Technical or engineered material use); USES (Uses)
(galvanized layer; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

IT 1430730-23-6, (Aluminum + zinc) 85-93, iron 7-15
RL: TEM (Technical or engineered material use); USES (Uses)
(galvannealed layer; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)

IT 7440-02-0, Nickel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(precoating with; hot-dip galvanized steel sheet with high

tensile strength and excellent formability and its manuf.)
IT 12169-32-3, Cementite 12173-93-2, Martensite, uses 12244-31-4, Austenite, uses 12427-23-5, Bainite 12427-24-6, Ferrite (ferrous metal component) 12427-27-9, Pearlite
RL: TEM (Technical or engineered material use); USES (Uses)
(steel substrate microstructure component; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)
IT 7439-95-4D, Magnesium, trace in alloy 7440-70-2D, Calcium, trace in alloy 1428932-65-3 1431057-05-4D, Ca(0.0005-0.01%) Mg(0.0005-0.01%) rare earth metal(0.0005-0.01%)
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; hot-dip galvanized steel sheet with high tensile strength and excellent formability and its manuf.)
OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 54 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:515313 CAPLUS Full-text
DOCUMENT NUMBER: 158:510556
TITLE: Steel sheet having hot-dip galvanized layer and exhibiting superior plating wettability and plating adhesion, and production method therefor
INVENTOR(S): Fujita, Soshi; Yamanaka, Shintaro; Sato, Koichi
PATENT ASSIGNEE(S): Nippon Steel & Sumitomo Metal Corporation, Japan
SOURCE: PCT Int. Appl., 66pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2013047804	A1	20130404	WO 2012-JP75189	20120928
CA 2848949	A1	20130404	CA 2012-2848949	20120928
CA 2848949	C	20160920		
KR 2014053322	A	20140507	KR 2014-7006759	20120928
KR 1624810	B1	20160526		
CN 103827342	A	20140528	CN 2012-80047145	20120928
CN 103827342	B	20160622		
MX 2014003789	A	20140710	MX 2014-3789	20120928
MX 359228	B	20180920		
EP 2762601	A1	20140806	EP 2012-835446	20120928
EP 2762601	B1	20180530		
TW I465581	B	20141221	TW 2012-135905	20120928
JP 5648741	B2	20150107	JP 2013-514485	20120928
RU 2584060	C2	20160520	RU 2014-117496	20120928
BR 112014007509	A2	20170404	BR 2014-112014007509	20120928
ES 2680649	T3	20180910	ES 2012-835446	20120928
IN 2014DN02028	A	20150313	IN 2014-DN2028	20140318
US 20140234656	A1	20140821	US 2014-14346618	20140321
US 9752221	B2	20170905		
ZA 2014002254	A	20150826	ZA 2014-2254	20140326
JP 2015038245	A	20150226	JP 2014-173185	20140827
JP 5907221	B2	20160426		

PRIORITY APPLN. INFO.:
JP 2011-217144 A 20110930
JP 2013-514485 A3 20120928
WO 2012-JP75189 W 20120928
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Provided are a steel sheet that has a hot-dip galvanized layer and that exhibits superior plating wettability and plating adhesion, and a prodn. method therefor. A steel sheet contg. readily oxidizable elements including Si and Mn is used as a base material. The hot-dip galvanized steel sheet has a hot-dip galvanized layer (A) on the surface of the steel sheet and is characterized by having a (B) layer that is directly under the surface of and inside of the steel sheet. The (B) layer has a thickness of 0.001 μm to 0.5 μm. By mass, the (B) layer contains 50 mass% or more of unoxidized Fe, less than 50 mass% total of one or more oxides of Fe, Si, Mn, P, S, and/or Al, and contains unoxidized C, Si, Mn, P, S, and/or Al in the following quantities: less

than 0.05 mass% of C; less than 0.1 mass% of Si; less than 0.5 mass% of Mn; less than 0.001 mass% of P; less than 0.001 mass% of S; and less than 0.005 mass% of Al. The steel sheet has a compn. contg. C 0.05-0.50, Si 0.1-3.0, Mn 0.5-5.0, P 0.001-0.5, S 0.001-0.03, Al 0.005-1.0, and balance Fe and inevitable impurities.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
NKK Corp	2001			JP 2001200352 A	CAPLUS
Nippon Steel Corp	2001			JP 2001226742 A	CAPLUS
Nippon Steel Corp	2003			CN 101125473 A	CAPLUS
Nippon Steel Corp	2003			EP 1504134 A	CAPLUS
Nippon Steel Corp	2003			CN 1639375 A	CAPLUS
Nippon Steel Corp	2003			WO 2002101112 A2	CAPLUS
Nippon Steel Corp	2003			AU 2002304255 A	CAPLUS
Nippon Steel Corp	2003			JP 2003171752 A	CAPLUS
Nippon Steel Corp	2003			US 20040202889 A1	CAPLUS
Nippon Steel Corp	2003			KR 20070026882 A	
Nippon Steel Corp	2003			KR 20070026883 A	
Nippon Steel Corp	2003			US 20080035247 A1	CAPLUS
Nippon Steel Corp	2003			US 20090272467 A1	CAPLUS
Nippon Steel Corp	2003			BR 210265 A	
Nippon Steel Corp	2003			CA 2449604 A1	CAPLUS
Nippon Steel Corp	2003			TW 573021 B	CAPLUS
Nippon Steel Corp	2003			DE 60220191 D	
Nippon Steel Corp	2003			DE 60220191 T	

IT 1428957-53-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

RN 1428957-53-2 CAPLUS

CN Iron alloy, base, Fe 78-99,Mn 0.5-5,Si 0.1-3,Al 0-1,B 0-1,Ca 0-1,Cr 0-1,Cu 0-1,misch metal 0-1,Mo 0-1,Nb 0-1,Ni 0-1,Ti 0-1,V 0-1,W 0-1,Zr 0-1,C 0-0.5,P 0-0.5 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	78	-	99	7439-89-6
Mn	0.5	-	5	7439-96-5
Si	0.1	-	3	7440-21-3
Al	0	-	1	7429-90-5
B	0	-	1	7440-42-8
Ca	0	-	1	7440-70-2
Cr	0	-	1	7440-47-3
Cu	0	-	1	7440-50-8
Misch metal	0	-	1	8049-20-5
Mo	0	-	1	7439-98-7
Nb	0	-	1	7440-03-1
Ni	0	-	1	7440-02-0
Ti	0	-	1	7440-32-6
V	0	-	1	7440-62-2
W	0	-	1	7440-33-7
Zr	0	-	1	7440-67-7
C	0	-	0.5	7440-44-0
P	0	-	0.5	7723-14-0

IPCI C23C0002-06 [I]; C22C0018-00 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C23C0002-02 [I]; C23C0002-40 [I]

IPCR C23C0002-06 [I]; C22C0018-00 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C23C0002-02 [I]; C23C0002-40 [I]

CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56

ST hot dip galvanization steel sheet pretreatment annealing hydrogen atm

IT Water vapor
(annealing in atm. contg.; manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

IT Annealing
(in H-contg. atm.; manuf. of hot-dip galvanized steel sheet

by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

IT Cold rolling
Hot rolling
Hot-dip galvanizing
(manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

IT Controlled atmospheres
(reducing, annealing in; manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

IT 1333-74-0, Hydrogen, uses 7727-37-9, Nitrogen, uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(annealing in atm. contg.; manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

IT 1428957-52-1 1428957-53-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of hot-dip galvanized steel sheet by annealing cold rolled steel sheet in H-contg. atm. before galvanizing)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L13 ANSWER 55 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2013:11896 CAPLUS Full-text
DOCUMENT NUMBER: 158:137246
TITLE: Heat-treated hardened steel with excellent impact performance, and method for manufacturing heat-treated hardened type component using the same
INVENTOR(S): Nam, Seung-Man; Im, Hee-Joong; Lee, Seung-Ha; Kim, Dong-Eun; Lee, Bo-Ryong; Kim, Young-Jin; Moon, Man-Been
PATENT ASSIGNEE(S): Hyundai Hysco, S. Korea
SOURCE: PCT Int. Appl., 21pp.; Chemical Indexing Equivalent to 156:209484 (KR)
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Korean
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2013002441	A1	20130103	WO 2011-KR4785	20110630
KR 1108838	B1	20120131	KR 2011-64159	20110630
CN 103534372	A	20140122	CN 2011-80070743	20110630
CN 103534372	B	20160210		
EP 2728027	A1	20140507	EP 2011-868749	20110630
EP 2728027	B1	20190116		
US 20140083574	A1	20140327	US 2013-14115516	20131104
US 20160281190	A1	20160929	US 2016-15173200	20160603

PRIORITY APPLN. INFO.:
KR 2011-64159 A 20110630
WO 2011-KR4785 W 20110630
US 2013-14115516 A3 20131104

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The title heat-treated hardened steel contains (by wt.%) C 0.12-0.8, Cr 0.01-2, Mo <0.2, B 0.0005-0.08, Sb <1.0, at least one of Ti and Nb <0.2, Si, Mn, Al and Ni satisfying one of content formulas i to iii (content formula i: Si 0.5-3, Mn 1-10 and Al 0.05-2; content formula ii: Si 0.5-3, Mn 1-10, Al <0.1 and Ni 0.01-8; content formula iii: Si 0.5-3, Mn 1-10, Al 0.1-2.5 and Ni 0.01-8), and Fe and other unavoidable impurities as balance. The heat-treated hardened steel has improved impact performance, tensile strength ≥1000 MPa, yield strength ≥800 MPa and elongation ≥10%. The heat-treated hardened steel has optionally a coating layer of Al-Si, Zn and oxidn.-resistant materials.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Hyundai Hysco	2011			KR 101033767 B1	

Jfe Steel Kk |2005 | | |JP 2005126817 A |CAPLUS
Jfe Steel Kk |2005 | | |JP 2005126817 A |CAPLUS
Jfe Steel Kk |2005 | | |JP 2005126818 A |CAPLUS
Nippon Steel Corp |2002 | | |JP 2002294397 A |CAPLUS
IT 1356391-47-3 1356391-49-5 1356391-50-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(heat-treated hardened steel with excellent impact
performance, and method for manufg. heat-treated hardened type
component using the same)
RN 1356391-47-3 CAPLUS
CN Iron alloy, base, Fe 80-98,Mn 1-10,Si 0.5-3,Al 0-2,Cr 0-2,Sb 0-1,C
0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Si	0.5	-	3	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

RN 1356391-49-5 CAPLUS
CN Iron alloy, base, Fe 74-98,Mn 1-10,Ni 0-8,Si 0.5-3,Cr 0-2,Sb 0-1,C
0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,Al 0-0.1,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	74	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Ni	0	-	8	7440-02-0
Si	0.5	-	3	7440-21-3
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8

RN 1356391-50-8 CAPLUS
CN Iron alloy, base, Fe 72-98,Mn 1-10,Ni 0-8,Si 0.5-3,Al 0.1-2.5,Cr 0-2,Sb
0-1,C 0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	72	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Ni	0	-	8	7440-02-0
Si	0.5	-	3	7440-21-3
Al	0.1	-	2.5	7429-90-5
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C21D0009-46 [I]; C22C0038-58 [I]; C21D0008-00 [I];
C23C0002-04 [I]
IPCR C22C0038-00 [I]; C21D0008-00 [I]; C21D0009-46 [I]; C22C0038-58 [I];

C23C0002-04 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST thermally hardened steel impact resistance strength
IT Elongation, mechanical
Galvanizing
Heat treatment
Tensile strength
Yield strength
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)
IT 1356391-47-3 1356391-49-5 1356391-50-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)
IT 7440-66-6, Zinc, uses 11099-22-2
RL: TEM (Technical or engineered material use); USES (Uses)
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)

L13 ANSWER 56 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2012:665719 CAPLUS Full-text
DOCUMENT NUMBER: 156:594034
TITLE: Method for manufacturing automobile part having different local strengths using heat-treatment hardening steel plate
INVENTOR(S): Nam, Seung-Man; Chae, Su-Hong; Kwon, Min-Suck; Kim, Hyo-Sub; Im, Hee-Joong; Lee, Bo-Ryong; Moon, Man-Been
PATENT ASSIGNEE(S): Hyundai Hysco, S. Korea
SOURCE: PCT Int. Appl., 19pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Korean
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2012060496	A1	20120510	WO 2010-KR7829	20101108
KR 1033767	B1	20110509	KR 2010-108528	20101103
CN 102712962	A	20121003	CN 2010-80038066	20101108
CN 102712962	B	20170524		
JP 2013501631	T	20130117	JP 2012-541934	20101108
JP 5509337	B2	20140604		
EP 2636759	A1	20130911	EP 2010-855727	20101108
EP 2636759	B1	20190605		
US 20120216920	A1	20120830	US 2012-13390537	20120215
US 20150167111	A1	20150618	US 2015-14630390	20150224

PRIORITY APPLN. INFO.:
KR 2010-108528 A 20101103
WO 2010-KR7829 W 20101108
US 2012-13390537 A3 20120215
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The present invention relates to a method for manufg. automobile parts having different local strengths, and more specifically, to a method for manufg. automobile parts using a heat-treatment hardened steel having different local thicknesses. The present invention provides a method for manufg. automobile parts comprising: a blank sheet prepn. step for prepg. blank sheets using a heat-treatment hardening steel plate having different thicknesses, and a heat-treatment hardening steel plate having different materials, according to the strength required; a blank conjugate forming step for forming a blank conjugate by connecting the blank sheets using laser welding; a cold molding step for cold press molding the blank conjugates; and a heat-treatment hardening step for heating the cold-molded part to above AC3 temp., then resolving mold retention stress by quenching the part when constrained in a metal mold, and enhancing the strength thereby.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

Aisin Takaoka Ltd	2004			JP 2004058082 A	CAPLUS
Hyundai Hysco	2009			KR 100902857 B1	
Sumitomo Metal Ind Ltd	2007			JP 2007154257 A	CAPLUS
Voestalpine Automotive	2006			WO 2006015849 A2	CAPLUS

IT 1374118-68-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)
RN 1374118-68-9 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1,S 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.2 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0
S	0 - 0.1	7704-34-9

IPCI C21D0008-02 [I]; C21D0001-00 [I]; B21D0022-00 [I]; B23K0026-20 [I]
IPCR C21D0008-02 [I]; B21D0022-00 [I]; B23K0026-20 [I]; C21D0001-00 [I]
CC 55-5 (Ferrous Metals and Alloys)
ST steel heat treatment welding molding hardening zinc coating automobile
IT Automobile parts
Coating materials
Cold-press molding
Hardening (mechanical)
Heat treatment
Laser welding
Quenching (cooling)
(method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)
IT Stress, mechanical
(residual; method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)
IT 7429-90-5, Aluminum, processes 7440-66-6, Zinc, processes 11133-86-1
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coating; method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)
IT 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-36-0, Antimony, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses
RL: MOA (Modifier or additive use); USES (Uses)
(method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)
IT 1297459-46-1, processes 1297459-50-7, processes 1374118-68-9 1374118-70-3, processes 1374118-73-6
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. automobile part having different local strengths using heat-treatment hardening steel plate)

L13 ANSWER 57 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2012:340397 CAPLUS Full-text
DOCUMENT NUMBER: 156:316277
TITLE: Method for manufacture coated steel parts by hot forming
INVENTOR(S): Verloop, Willem Cornelis; Genderen, Marc Jacco Van; Tol, Ronald Theodoor Van; Hensen, Guido Cornelis; Loiseaux, Jenny
PATENT ASSIGNEE(S): Tata Steel IJmuiden BV, Neth.

SOURCE: PCT Int. Appl., 15 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2012028224	A1	20120308	WO 2011-EP3601	20110719
CA 2809187	A1	20120308	CA 2011-2809187	20110719
CN 103108964	A	20130515	CN 2011-80041783	20110719
CN 103108964	B	20150617		
EP 2611945	A1	20130710	EP 2011-734020	20110719
EP 2611945	B1	20180228		
KR 2013099042	A	20130905	KR 2013-7006164	20110719
JP 2013542315	T	20131121	JP 2013-525155	20110719
BR 112013004952	A2	20160816	BR 2013-112013004952	20110719
ES 2663005	T3	20180410	ES 2011-734020	20110719
US 9127329	B2	20150908	US 2013-13818041	20130220
US 20130153094	A1	20130620		
MX 2013002063	A	20130405	MX 2013-2063	20130221
IN 2013CN02333	A	20160603	IN 2013-CN2333	20130325

PRIORITY APPLN. INFO.: EP 2010-9041 A 20100831
WO 2011-EP3601 W 20110719
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention relates to a method for manufg. a coated part having high mech. properties using hot forming techniques. The method comprises the following steps: providing an annealed steel strip or blank or pre-shaped part that was coated with a metal or alloy before the annealing; cutting a blank from the strip before or after the annealing; optionally forming a pre-shaped part from the blank; heating the blank or pre-shaped part to a temp. of 500° at an av. heating rate of 16°/s or more; further heating the blank or pre-shaped part to a temp. between 700 and 1000°; hot forming the blank or pre-shaped part into a hot formed part; hardening the hot formed part. The steel has the following compn., wt.%: C 0.1-0.5, Mn 0.5-3.0, Si 0.1-0.5, Cr <1.0, Ti <0.2, Al <0.1, P <0.1, S <0.05, B 0.0005-0.08, optionally Nb and V <0.1 each, and Fe - the balance. The coating is a zinc alloy comprising Al and Mg 1.0-5.0 wt.% each. The invention also relates to a method for manufg. a coated steel strip, blank or pre-shaped part, and to a coated steel strip, blank, or part and a hot formed part.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Cornelis, V	2010			WO 2010069588 A1	CAPLUS
Kazuh, K	2010			WO 2010005121 A1	CAPLUS
Thyssenkrupp Steel Ag	2009			DE 102008022400 A1	CAPLUS
Voestalpine Stahl Gmbh	2010			EP 2177641 A1	CAPLUS
Volks	2010			WO 2010085983 A1	CAPLUS

IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)
RN 1360605-36-2 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Nb 0-0.1,P 0-0.1,V 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.1	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Nb	0	-	0.1	7440-03-1
P	0	-	0.1	7723-14-0

V	0	-	0.1	7440-62-2

IPCI C21D0008-04 [I]; C21D0009-46 [I]; C22C0038-02 [I]; C22C0038-04 [I]; C21D0001-673 [I]; C21D0009-48 [I]
IPCR C21D0008-04 [I]; C21D0001-673 [I]; C21D0009-46 [I]; C21D0009-48 [I]; C22C0038-02 [I]; C22C0038-04 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel strip coating hot deformation
IT Plastic deformation
(hot; method for manuf. coated steel parts by hot forming)
IT 1360605-37-3
RL: TEM (Technical or engineered material use); USES (Uses)
(coating; method for manuf. coated steel parts by hot forming)
IT 1360605-36-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manuf. coated steel parts by hot forming)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 58 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2012:296418 CAPLUS Full-text
DOCUMENT NUMBER: 156:290294
TITLE: Steel sheet for hot pressing, its manufacturing method, and hot-pressed material
INVENTOR(S): Nakajima, Seiji; Nakamaru, Hiroki
PATENT ASSIGNEE(S): JFE Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2012041610	A	20120301	JP 2010-184840	20100820
JP 5672849	B2	20150218		
PRIORITY APPLN. INFO.:			JP 2010-184840	20100820

AB The steel sheet for hot pressing has an Al-Fe alloy coating layer contg. Fe 25-90%, Si 25-90%, and the balance of Al and inevitable impurities at an amt. of 10-200 g/m2 per one side of the steel sheet, and it is obtained from a steel sheet contg. C 0.15-0.5, Si 0.05-2.0, Mn 0.5-3, P ≤0.1, S ≤0.05, Al ≤0.1 and N ≤0.01% by hot-dipping in an Al system bath to form the Al-Fe alloy layer and then hot-dip coated with an Al layer. The steel sheet is heated to Ac3 to 1000°C and hot pressed.
IT 1356847-15-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet for hot pressing, its manufg. method, and hot-pressed material)
RN 1356847-15-8 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	93	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Si	0	-	2	7440-21-3
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C23C0002-12 [I]; C22C0038-60 [I]; C22C0038-00 [I]; C22C0021-00 [I];
C23C0002-20 [I]; C23C0002-28 [I]; C23C0002-12 [I]; C22C0038-60 [I];
C22C0038-00 [I]; C22C0021-00 [I]; C23C0002-20 [I]; C23C0002-28 [I]
IPCR C23C0002-12 [I]; C22C0021-00 [I]; C22C0038-00 [I]; C22C0038-60 [I];
C23C0002-20 [I]; C23C0002-28 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST steel sheet aluminum iron alloy coating hot pressing
IT Hot-dip coating process
Hot-press sintering
(steel sheet for hot pressing, its manufg. method, and hot-pressed material)
IT 1359940-94-5 1359940-95-6
RL: TEM (Technical or engineered material use); USES (Uses)
(coating; steel sheet for hot pressing, its manufg. method, and hot-pressed material)
IT 1299468-35-1 1356847-15-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet for hot pressing, its manufg. method, and hot-pressed material)
IT 7429-90-5, Aluminum, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(steel sheet for hot pressing, its manufg. method, and hot-pressed material)
OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

L13 ANSWER 59 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2012:274720 CAPLUS Full-text
DOCUMENT NUMBER: 156:290355
TITLE: Method for manufacturing steel product with different strength using laser heat treatment
INVENTOR(S): Lim, Hui Jung; Nam, Seung Man; Lee, Bo Ryong; Kim, Gyeong Bo; Jung, Yeon Il
PATENT ASSIGNEE(S): Hyundai Hysco Co., Ltd., S. Korea
SOURCE: Repub. Korea, 10pp.
CODEN: KRXXFC
DOCUMENT TYPE: Patent
LANGUAGE: Korean
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
KR 1119173	B1	20120222	KR 2011-100174		20110930
WO 2013047939	A1	20130404	WO 2011-KR7703		20111017
CN 103842527	A	20140604	CN 2011-80073901		20111017
EP 2762577	A1	20140806	EP 2011-873399		20111017
EP 2762577	B1	20160427			
JP 2014534334	T	20141218	JP 2014-533173		20111017
JP 5898772	B2	20160406			
US 20140227553	A1	20140814	US 2014-14343955		20140310
US 20150211086	A1	20150730	US 2015-14683933		20150410
PRIORITY APPLN. INFO.:			KR 2011-100174	A	20110930
			WO 2011-KR7703	W	20111017
			US 2014-14343955	A3	20140310

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The title method comprises: (1) prepg. material composed of, by wt.%,: C 0.1-0.5, Si 0.1-0.5, Mn 0.5-3.0, P <0.1, S <0.05, Cr 0.01-1.0, Al <0.1, Ti <0.2, B 0.0005-0.08, and Fe and unavoidable impurities as balance, (2) forming the material into a preset shape to obtain a formed body, and (3) performing laser heat treatment for the part needing high strength on the formed body to locally strengthen the high-strength part. In the method, it is possible to perform local strengthening using laser heat treatment.
IT 1358890-23-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. steel product with different strength using laser heat treatment)
RN 1358890-23-9 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.1-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.1	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
P	0	-	0.1	7723-14-0

IPCI C21D0001-09 [I]; C22C0038-38 [I]; C23C0002-04 [I]
IPCR C21D0001-09 [I]; C22C0038-38 [I]; C23C0002-04 [I]
CC 55-12 (Ferrous Metals and Alloys)
ST steel molding laser heat treatment mech property
IT Heat treatment
(laser; method for manufg. steel product with different strength using laser heat treatment)
IT Lasers
Mechanical properties
Molding
(method for manufg. steel product with different strength using laser heat treatment)
IT 7429-90-5, Aluminum, processes 7440-66-6, Zinc, processes 11133-86-1 12635-57-3
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coating; method for manufg. steel product with different strength using laser heat treatment)
IT 1358890-23-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. steel product with different strength using laser heat treatment)

L13 ANSWER 60 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2012:198116 CAPLUS Full-text
DOCUMENT NUMBER: 156:236353
TITLE: Steel sheet for hot stamping, and process for manufacturing hot-stamped steel products using steel sheet for hot stamping
INVENTOR(S): Nakajima, Seiji; Miyoshi, Tatsuya; Nakamaru, Hiroki
PATENT ASSIGNEE(S): JFE Steel Corporation, Japan
SOURCE: PCT Int. Appl., 23pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2012018014	A1	20120209	WO 2011-JP67680	20110802
JP 4883240	B1	20120222	JP 2011-157378	20110719
JP 2012233247	A	20121129		
CA 2806263	A1	20120209	CA 2011-2806263	20110802
CA 2806263	C	20140325		
AU 2011286715	A1	20130214	AU 2011-286715	20110802
AU 2011286715	B2	20131205		
CN 103038398	A	20130410	CN 2011-80037013	20110802
CN 103038398	B	20141203		
KR 2013045898	A	20130506	KR 2013-7001759	20110802
KR 1361605	B1	20140211		
EP 2602359	A1	20130612	EP 2011-814639	20110802
EP 2602359	B1	20181010		
ZA 2013000566	A	20140326	ZA 2013-566	20110802
RU 2520847	C1	20140627	RU 2013-104193	20110802
MY 154711	A	20150715	MY 2013-333	20110802
BR 112013002586	A2	20160607	BR 2013-112013002586	20110802

BR 112013002586	B1	20201027			
TW I451004	B	20140901	TW 2011-127564		20110803
US 20130122322	A1	20130516	US 2013-13813328		20130130
US 9023488	B2	20150505			
IN 2013KN00256	A	20130705	IN 2013-KN256		20130130
IN 292658	B	20180209			
MX 2013001343	A	20130322	MX 2013-1343		20130201
PRIORITY APPLN. INFO.:			JP 2010-174957	A	20100804
			JP 2011-553	A	20110105
			JP 2011-91633	A	20110418
			JP 2011-157378	A	20110719
			WO 2011-JP67680	W	20110802

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The purpose of the present invention is to provide a steel sheet which is to be hot-stamped and which can yield hot-stamped products with excellent pitting corrosion resistance and a process for manufg. hot-stamped steel products using the steel sheet. A steel sheet for hot stamping, characterized by bearing, successively on the surface of a substrate steel sheet, a plating layer (I) which contains at least 60% by mass of Ni, with the balance consisting of Zn and unavoidable impurities, and which has a plating wt. of 0.01 to 5 g/m2, and a plating layer (II) which contains 10 to 25% by mass of Ni, with the balance consisting of Zn and unavoidable impurities, and which has a plating wt. of 10 to 90 g/m2.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Kobe Steel Ltd	1995			JP 07166371 A	CAPLUS
Sumitomo Metal Industri	1999			JP 11-350198 A	CAPLUS
Sumitomo Metal Industri	2003			CN 101144162 A	CAPLUS
Sumitomo Metal Industri	2003			EP 1439240 A1	CAPLUS
Sumitomo Metal Industri	2003			CN 1575348 A	CAPLUS
Sumitomo Metal Industri	2003			WO 2003035922 A1	
Sumitomo Metal Industri	2003			JP 2003129209 A	CAPLUS
Sumitomo Metal Industri	2003			JP 200373774 A	
Sumitomo Metal Industri	2003			US 20040166360 A1	CAPLUS
Sumitomo Metal Industri	2003			US 20050252262 A1	
Sumitomo Metal Industri	2003			KR 20060090309 A	
Sumitomo Metal Industri	2003			AT 468416 T	CAPLUS
Sumitomo Metal Industri	2003			DE 60236447 D	
United Technologies Cor	2004			SG 134989 A	CAPLUS
United Technologies Cor	2004			EP 1405934 A2	CAPLUS
United Technologies Cor	2004			CN 1497065 A	CAPLUS
United Technologies Cor	2004			KR 20040026618 A	
United Technologies Cor	2004			US 20040058189 A1	CAPLUS
United Technologies Cor	2004			JP 2004115914 A	CAPLUS
United Technologies Cor	2004			US 20050058848 A1	CAPLUS
United Technologies Cor	2004			CA 2441718 A	CAPLUS
United Technologies Cor	2004			CA 2441718 A1	CAPLUS
United Technologies Cor	2004			TW 276707 B	
United Technologies Cor	2004			BR 304193 A	
United Technologies Cor	2004			AT 397683 T	CAPLUS
United Technologies Cor	2004			DE 60321435 D	

IT 1356847-15-8

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(steel sheet for hot stamping, and process for manufg. hot-stamped steel products using steel sheet for hot stamping)

RN 1356847-15-8 CAPLUS

CN Iron alloy, base, Fe 93-99,Mn 0.5-3,Si 0-2,Cr 0-1,C 0.2-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	93 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Si	0 - 2	7440-21-3
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0

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    Ti      0   -   0.2      7440-32-6
    Al      0   -   0.1      7429-90-5
    B       0   -   0.1      7440-42-8
    P       0   -   0.1      7723-14-0

IPCI C25D0005-26 [I]; B21D0022-20 [I]; C22C0018-00 [I]; C22C0019-03 [I];
     C22C0038-00 [I]; C22C0038-60 [I]
IPCR C25D0005-26 [I]; B21D0022-20 [I]; C22C0018-00 [I]; C22C0019-03 [I];
     C22C0038-00 [I]; C22C0038-60 [I]
CC   55-6 (Ferrous Metals and Alloys)
     Section cross-reference(s): 72
ST   hot stamping steel sheet nickel zinc alloy electrodeposition
IT   Metalworking
        (stamping; steel sheet for hot stamping, and process for
        manufg. hot-stamped steel products using steel
        sheet for hot stamping)
IT   Electrodeposition
     Pitting corrosion
        (steel sheet for hot stamping, and process for manufg.
        hot-stamped steel products using steel sheet for
        hot stamping)
IT   Polysiloxanes
     RL: TEM (Technical or engineered material use); USES (Uses)
        (steel sheet for hot stamping, and process for manufg.
        hot-stamped steel products using steel sheet for
        hot stamping)
IT   7440-02-0, Nickel, uses   238084-01-0
     RL: TEM (Technical or engineered material use); USES (Uses)
        (coating; steel sheet for hot stamping, and process
        for manufg. hot-stamped steel products using steel
        sheet for hot stamping)
IT   7631-86-9, Colloidal silica, uses
     RL: TEM (Technical or engineered material use); USES (Uses)
        (colloidal; steel sheet for hot stamping, and process for
        manufg. hot-stamped steel products using steel
        sheet for hot stamping)
IT   1299468-35-1   1356847-15-8
     RL: PEP (Physical, engineering or chemical process); TEM (Technical or
     engineered material use); PROC (Process); USES (Uses)
        (steel sheet for hot stamping, and process for manufg.
        hot-stamped steel products using steel sheet for
        hot stamping)
IT   3227-63-2, Zirconium acetate   11138-49-1, Sodium aluminate   12627-14-4,
     Lithium silicate   39302-37-9, Lithium titanate
     RL: TEM (Technical or engineered material use); USES (Uses)
        (steel sheet for hot stamping, and process for manufg.
        hot-stamped steel products using steel sheet for
        hot stamping)
OS.CITING REF COUNT:     5     THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD
                               (5 CITINGS)


L13  ANSWER 61 OF 103  CAPLUS  COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER:        2012:169521  CAPLUS Full-text
DOCUMENT NUMBER:         156:209484
TITLE:                   Heat-treated hardened steel with excellent impact
                         performance, and method for manufacturing heat-treated
                         hardened type component using the same
INVENTOR(S):             Nam, Seung Man; Lim, Hui Jung; Lee, Seung Ha; Kim,
                         Dong Eun; Lee, Bo Ryong; Kim, Yeong Jin; Moon, Man Bin
PATENT ASSIGNEE(S):      Hyundai Hysco Co., Ltd., S. Korea
SOURCE:                  Repub. Korea, 14pp.; Chemical Indexing Equivalent to
                         158:137246 (WO)
                         CODEN: KRXXFC
DOCUMENT TYPE:           Patent
LANGUAGE:                Korean
FAMILY ACC. NUM. COUNT:  2
PATENT INFORMATION:
     PATENT NO.          KIND  DATE        APPLICATION NO.          DATE
     ----------------    ----  --------    ---------------------    --------
     KR 1108838           B1   20120131    KR 2011-64159            20110630
     WO 2013002441        A1   20130103    WO 2011-KR4785           20110630
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CN 103534372	A	20140122	CN 2011-80070743		20110630
CN 103534372	B	20160210			
EP 2728027	A1	20140507	EP 2011-868749		20110630
EP 2728027	B1	20190116			
US 20140083574	A1	20140327	US 2013-14115516		20131104
US 20160281190	A1	20160929	US 2016-15173200		20160603
PRIORITY APPLN. INFO.:			KR 2011-64159	A	20110630
			WO 2011-KR4785	W	20110630
			US 2013-14115516	A3	20131104

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The title heat-treated hardened steel contains (by wt.%) C 0.12-0.8, Cr 0.01-2, Mo <0.2, B 0.0005-0.08, Sb <1.0, at least one of Ti and Nb <0.2, Si, Mn, Al and Ni satisfying one of content formulas i to iii (content formula i: Si 0.5-3, Mn 1-10 and Al 0.05-2; content formula ii: Si 0.5-3, Mn 1-10, Al <0.1 and Ni 0.01-8; content formula iii: Si 0.5-3, Mn 1-10, Al 0.1-2.5 and Ni 0.01-8), and Fe and other unavoidable impurities as balance. The heat-treated hardened steel has improved impact performance, tensile strength ≥1000 MPa, yield strength ≥800 MPa and elongation ≥10%. The heat-treated hardened steel has optionally a coating layer of Al-Si, Zn and oxidn.-resistant materials.

IT 1356391-47-3 1356391-49-5 1356391-50-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)

RN 1356391-47-3 CAPLUS
CN Iron alloy, base, Fe 80-98,Mn 1-10,Si 0.5-3,Al 0-2,Cr 0-2,Sb 0-1,C 0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	80	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Si	0.5	-	3	7440-21-3
Al	0	-	2	7429-90-5
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

RN 1356391-49-5 CAPLUS
CN Iron alloy, base, Fe 74-98,Mn 1-10,Ni 0-8,Si 0.5-3,Cr 0-2,Sb 0-1,C 0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,Al 0-0.1,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	74	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Ni	0	-	8	7440-02-0
Si	0.5	-	3	7440-21-3
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8

RN 1356391-50-8 CAPLUS
CN Iron alloy, base, Fe 72-98,Mn 1-10,Ni 0-8,Si 0.5-3,Al 0.1-2.5,Cr 0-2,Sb 0-1,C 0.1-0.8,Mo 0-0.2,Nb 0-0.2,Ti 0-0.2,B 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number

Fe	72	-	98	7439-89-6
Mn	1	-	10	7439-96-5
Ni	0	-	8	7440-02-0
Si	0.5	-	3	7440-21-3
Al	0.1	-	2.5	7429-90-5
Cr	0	-	2	7440-47-3
Sb	0	-	1	7440-36-0
C	0.1	-	0.8	7440-44-0
Mo	0	-	0.2	7439-98-7
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
B	0	-	0.1	7440-42-8

IPCI C22C0038-00 [I]; C21D0009-46 [I]; C21D0008-00 [I]; C23C0002-04 [I]
IPCR C22C0038-00 [I]; C21D0008-00 [I]; C21D0009-46 [I]; C23C0002-04 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST thermally hardened steel impact resistance strength
IT Elongation, mechanical
Galvanizing
Heat treatment
Tensile strength
Yield strength
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)
IT 1356391-47-3 1356391-49-5 1356391-50-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)
IT 7440-66-6, Zinc, uses 11099-22-2
RL: TEM (Technical or engineered material use); USES (Uses)
(heat-treated hardened steel with excellent impact performance, and method for manufg. heat-treated hardened type component using the same)

L13 ANSWER 62 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2010:880522 CAPLUS Full-text
DOCUMENT NUMBER: 153:180874
TITLE: Process for manufacture of high tensile strength hot-dip galvanized steel sheet with uniform galvanized coating
INVENTOR(S): Yamanaka, Shintaro
PATENT ASSIGNEE(S): Nippon Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2010156029	A	20100715	JP 2009-199	20090105
JP 5594559	B2	20140924		
PRIORITY APPLN. INFO.:			JP 2009-199	20090105

AB The base steel comprises C 0.001-0.3, Si 0.5-2.0, Mn 1.0-3.0, P 0.002-0.2, S 0.001-0.03, Al 0.005-1 wt.%, and balance Fe. The manufg. process includes continuous hot-dip galvanization. When a steel sheet is put into plating bath, the sheet temp. is 100-180° higher than the plating bath temp. The plating bath temp. is kept 440-470°. Optionally the base steel contains total 0.05-1.0 wt.% Ti, Nb, B, Cr, and/or Mo. The galvanized steel sheet has uniform galvanized coating and good appearance.
IT 1234653-91-8
RL: TEM (Technical or engineered material use); USES (Uses)
(base steel; manuf. of high tensile strength hot-dip galvanized steel sheet with uniform galvanized coating)
RN 1234653-91-8 CAPLUS
CN Iron alloy, base, Fe 92-98,Mn 1-3,Si 0.5-2,Al 0-1,B 0-1,Cr 0-1,Mo 0-1,Nb

0-1,Ti 0-1,C 0-0.3,P 0-0.2 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	92 - 98	7439-89-6
Mn	1 - 3	7439-96-5
Si	0.5 - 2	7440-21-3
Al	0 - 1	7429-90-5
B	0 - 1	7440-42-8
Cr	0 - 1	7440-47-3
Mo	0 - 1	7439-98-7
Nb	0 - 1	7440-03-1
Ti	0 - 1	7440-32-6
C	0 - 0.3	7440-44-0
P	0 - 0.2	7723-14-0

IPCI C23C0002-06 [I]; C23C0002-40 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-38 [I]; C21D0009-46 [I]; C23C0002-06 [I]; C23C0002-40 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-38 [I]; C21D0009-46 [I]
IPCR C23C0002-06 [I]; C21D0009-46 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-38 [I]; C23C0002-40 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST high tensile strength hot dip galvanized steel
IT Hot-dip galvanizing
(continuous; manuf. of high tensile strength hot-dip galvanized steel sheet with uniform galvanized coating)
IT Galvanized steel
RL: TEM (Technical or engineered material use); USES (Uses)
(hot-dip; manuf. of high tensile strength hot-dip galvanized steel sheet with uniform galvanized coating)
IT 12697-71-1, uses 57923-89-4 144920-07-0, uses 797752-03-5, uses 1234653-91-8 1234653-92-9, uses 1234653-94-1, uses 1234653-96-3 1234653-97-4, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(base steel; manuf. of high tensile strength hot-dip galvanized steel sheet with uniform galvanized coating)

L13 ANSWER 63 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2010:267926 CAPLUS Full-text
DOCUMENT NUMBER: 152:316673
TITLE: Aluminum-containing copper alloy-coated steel member and its manufacture by thermal diffusion of aluminum
INVENTOR(S): Fujii, Takahiro; Tadano, Masayoshi; Hiraoka, Masashi; Izumi, Keiji
PATENT ASSIGNEE(S): Nisshin Steel Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2010047791	A	20100304	JP 2008-211413	20080820
JP 5561920	B2	20140730		

PRIORITY APPLN. INFO.: JP 2008-211413 20080820
AB The steel member has a Cu alloy coating layer with thickness 0.5-100 μm and Al content 1-15 wt.%. The coating layer may have compn. of Al 1-15, Ni ≤7, Fe ≤6, Cr ≤2, Mn ≤2 wt.%, and balance Cu at the center of the thickness. The manufg. process includes plating a steel substrate contg. 1-20 wt.% Al with Cu and heating at 600-1050° in nonoxidizing atm. for diffusion of Al from the substrate to the Cu plating layer. The Cu plating layer may be formed on a Ni undercoating layer by electrodeposition. The coating layer has good adhesion to the substrate. Al-contg. Cu alloy-coated steel members can be manufd. at a low cost and they have excellent resistance to oxidn., corrosion, and wear.

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

IT 1213779-75-9
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate before diffusion; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
RN 1213779-75-9 CAPLUS
CN Iron alloy, base, Fe 0-99,Cr 0-35,Ni 0-24,Al 1-20,Cu 0-6,Mn 0-5,Mo 0-5,Si 0-3,B 0-1,C 0-1,Nb 0-1,Ti 0-1,V 0-1,N 0-0.5,Ca 0-0.1,Mg 0-0.1,misch metal 0-0.1,P 0-0.1,Y 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	0 - 99	7439-89-6
Cr	0 - 35	7440-47-3
Ni	0 - 24	7440-02-0
Al	1 - 20	7429-90-5
Cu	0 - 6	7440-50-8
Mn	0 - 5	7439-96-5
Mo	0 - 5	7439-98-7
Si	0 - 3	7440-21-3
B	0 - 1	7440-42-8
C	0 - 1	7440-44-0
Nb	0 - 1	7440-03-1
Ti	0 - 1	7440-32-6
V	0 - 1	7440-62-2
N	0 - 0.5	17778-88-0
Ca	0 - 0.1	7440-70-2
Mg	0 - 0.1	7439-95-4
Misch metal	0 - 0.1	8049-20-5
P	0 - 0.1	7723-14-0
Y	0 - 0.1	7440-65-5

IPCI C23C0010-28 [I]; C22C0009-01 [I]; C22C0009-06 [I]; C22C0009-00 [I]; C22C0009-05 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C23C0010-28 [I]; C22C0009-01 [I]; C22C0009-06 [I]; C22C0009-00 [I]; C22C0009-05 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C21D0009-46 [I]; C22C0038-06 [I]; C25D0005-26 [I]; C25D0005-50 [I]
IPCR C23C0010-28 [I]; C21D0009-46 [I]; C22C0009-00 [I]; C22C0009-01 [I]; C22C0009-05 [I]; C22C0009-06 [I]; C22C0038-00 [I]; C22C0038-06 [I]; C22C0038-58 [I]; C25D0005-26 [I]; C25D0005-50 [I]
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56
ST aluminum copper alloy coated steel manuf diffusion
IT Coating materials
(abrasion-resistant; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT Abrasion-resistant materials
(coatings; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT Anticorrosive coating materials
Thermal diffusion
(manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT Chemically resistant coating materials
(oxidation-resistant; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT 1213779-71-5P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coating; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT 1213779-73-7 1213779-74-8
RL: MSC (Miscellaneous)
(coating; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)

IT 7440-50-8, Copper, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(plating layer; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT 12597-69-2, Steel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate after diffusion; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT 1197343-32-0 1213779-75-9 1213779-76-0 1213779-77-1
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate before diffusion; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
IT 7440-02-0, Nickel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(undercoating layer; manuf. of Al-contg. Cu alloy-coated steel members by thermal diffusion of Al from steel substrate to Cu plating layer)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 64 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2009:1460891 CAPLUS Full-text
DOCUMENT NUMBER: 151:574971
TITLE: Composite with a ballistic protective effect
INVENTOR(S): Becker, Jens-Ulrik; Hofmann, Harald; Hoeckling, Christian; Kern, Andreas; Schriever, Udo; Tamler, Horst Walter; Tschersich, Hans-Joachim
PATENT ASSIGNEE(S): ThyssenKrupp Steel Europe A.-G., Germany
SOURCE: Eur. Pat. Appl., 18pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 2123447	A1	20091125	EP 2008-103856	20080507
EP 2123447	B1	20181226		
ES 2709433	T3	20190416	ES 2008-103856	20080507
US 20120174752	A1	20120712	US 2009-436415	20090506
US 8545993	B2	20131001		

PRIORITY APPLN. INFO.: EP 2008-103856 A 20080507
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB The composite with a ballistic protective effect contains a 1st outer layer made of an alloy steel and ≥1 2nd layer made of an alloy steel which is arranged below the 1st layer. The 1st alloy steel contains C 0.06-1.05, Si 0.05-1.65, Mn 0.3-2.65, Al 0.015-1.55, Cr ≤1.2, Ti ≤0.13, Mo ≤0.7, Nb ≤0.1, B ≤0.005, P ≤0.08, S ≤0.01, Ni ≤4.0, and V ≤0.5%. The 2nd alloy steel contains C ≤1.0, Si ≤8.0, Mn 0.05-30.0, Al ≤10.0, Cr ≤10.0, Ti ≤0.5, Nb ≤0.5, B ≤0.1, V ≤0.5, Mo ≤5.0, P ≤0.1, S ≤0.03, N ≤0.3, Ni ≤8.0, Cu ≤3.0, and Sn ≤0.04%. The 2nd layer has a higher elongation than that of the 1st layer. Typically, the composite is produced by roll plating. The composite has enhanced ballistic properties; decreased wall thicknesses of parts are required. The composite is esp. suitable for motor vehicles and structural parts.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Allegheny Ludlum Corp	1996			EP 0731332 A	CAPLUS
Boehler & Co Ag Geb	1976			GB 1444063 A	CAPLUS
Creusot Loire	1992			EP 0509854 A	CAPLUS
Grell Karl-Ludwig	1995			US 5418074 A	CAPLUS
Junius Hans-Toni	2003			US 20030029530 A1	CAPLUS
Leger Jacques	1993			US 5213905 A	CAPLUS

Liebowitz, B	1948			US 2438759 A	
Nippon Steel Corp	1994			JP 06093370 A	CAPLUS
Pircher Hans	1987			US 4645720 A	CAPLUS
Thyssenkrupp Steel Ag	2006			DE 102005006606 B3	
Voest Alpine Ag	1983			AT 372113 B	
Voest Alpine Ag	1987			EP 0247020 A	CAPLUS

IT 1196665-70-9
RL: TEM (Technical or engineered material use); USES (Uses)
(in prodn. of composite with ballistic protective effect)
RN 1196665-70-9 CAPLUS
CN Iron alloy, base, Fe 23-100,Mn 0-30,Al 0-10,Cr 0-10,Ni 0-8,Si 0-8,Mo 0-5,Cu 0-3,C 0-1,Nb 0-0.5,Ti 0-0.5,V 0-0.5,N 0-0.3,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	23 - 100	7439-89-6
Mn	0 - 30	7439-96-5
Al	0 - 10	7429-90-5
Cr	0 - 10	7440-47-3
Ni	0 - 8	7440-02-0
Si	0 - 8	7440-21-3
Mo	0 - 5	7439-98-7
Cu	0 - 3	7440-50-8
C	0 - 1	7440-44-0
Nb	0 - 0.5	7440-03-1
Ti	0 - 0.5	7440-32-6
V	0 - 0.5	7440-62-2
N	0 - 0.3	17778-88-0
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

IPCI B32B0015-01 [I]; C21D0009-42 [I]; F41H0005-04 [I]
IPCR B32B0015-01 [I]; C21D0009-42 [I]; F41H0005-04 [I]
CC 55-4 (Ferrous Metals and Alloys)
ST steel laminated composite
IT 1196665-67-4 1196665-70-9 1196665-73-2, uses 1196665-75-4
1196665-77-6 1196665-79-8
RL: TEM (Technical or engineered material use); USES (Uses)
(in prodn. of composite with ballistic protective effect)
OS.CITING REF COUNT: 8 THERE ARE 8 CAPLUS RECORDS THAT CITE THIS RECORD (8 CITINGS)

L13 ANSWER 65 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2009:887390 CAPLUS Full-text
DOCUMENT NUMBER: 151:202847
TITLE: Method for manufacturing stamped coated steel products
INVENTOR(S): Drillet, Pascal; Spehner, Dominique; Kefferstein, Ronald
PATENT ASSIGNEE(S): ArcelorMittal France, Fr.
SOURCE: PCT Int. Appl., 27pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2009090555	A1	20090723	WO 2009-IB322	20090112
WO 2009090443	A1	20090723	WO 2008-IB79	20080115
CA 2713685	A1	20090723	CA 2009-2713685	20090112
CA 2713685	C	20120320		
KR 2010112602	A	20101019	KR 2010-7017170	20090112
EP 2242863	A1	20101027	EP 2009-701846	20090112
EP 2242863	B1	20140108		
CN 101910426	A	20101208	CN 2009-80102269	20090112
JP 2011512455	T	20110421	JP 2010-542705	20090112
JP 6146941	B2	20170614		
KR 2013008657	A	20130122	KR 2013-7000047	20090112
KR 1508861	B1	20150407		

RU 2499847	C2	20131127	RU 2010-134002		20090112
ES 2448551	T3	20140314	ES 2009-701846		20090112
BR 2009007223	A2	20150714	BR 2009-7223		20090112
BR 2009007223	B1	20170606			
MX 2010007428	A	20100903	MX 2010-7428		20100705
IN 2010CN04187	A	20110107	IN 2010-CN4187		20100706
IN 289869	B	20171201			
PRIORITY APPLN. INFO.:			WO 2008-IB79	A	20080115
			KR 2010-7017170	A3	20090112
			WO 2009-IB322	W	20090112

AB The invention relates to a process for making a hot stamped coated steel sheet product. The methods comprises the steps of pre-coating a steel strip or sheet by aluminum or aluminum-iron-silicon alloy, cutting said pre-coated strip to obtain a pre-coated steel blank, heating the blank in a furnace preheated to a temp. and during a time defined by diagram according to thickness, at a heating rate Vc of 4-12°/s between 20 and 700° and at a heating rate Vc' of 1.5 and 6°/s between 500 and 700°, to obtain a heated blank. Further steps include transferring said heated blank to a die, hot stamping, cooling at a mean rate Vr of at least 30°/s between the exit of the heated blank from the furnace and down to 400°.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Kefferstein Ronald	2001			US 20010042393 A1	
Lorraine Laminage	2000			EP 0971044 A	CAPLUS
Nissan Motor	2004			EP 1380666 A	CAPLUS
Usinor	2003			FR 2833504 A	CAPLUS

IT 1173986-65-6
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. stamped coated steel products)
RN 1173986-65-6 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	94	-	99	7439-89-6
Mn	0.5	-	3	7439-96-5
Cr	0	-	1	7440-47-3
C	0.2	-	0.5	7440-44-0
Si	0.1	-	0.5	7440-21-3
Ti	0	-	0.2	7440-32-6
Al	0	-	0.1	7429-90-5
B	0	-	0.1	7440-42-8
Cu	0	-	0.1	7440-50-8
Ni	0	-	0.1	7440-02-0
P	0	-	0.1	7723-14-0

IPCI C21D0008-02 [I]; C22C0038-32 [I]; C22C0038-38 [I]; B21D0053-26 [I]; C23C0002-12 [I]
IPCR C21D0008-02 [I]; B21D0053-26 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C23C0002-12 [I]
CC 55-11 (Ferrous Metals and Alloys)
ST steel aluminum coating hot stamping
IT Hot-dip coating process
(method for manufg. stamped coated steel products)
IT Metalworking
(stamping, hot; method for manufg. stamped coated steel products)
IT 1173986-72-5
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(interdiffusion layer; method for manufg. stamped coated steel products)
IT 1173986-68-9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermediate and superficial layer; method for manufg.

stamped coated steel products)
IT 1173986-67-8 1173986-76-9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermediate layer; method for manufg. stamped coated steel products)
IT 1173986-70-3 1173986-74-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermetallic layer; method for manufg. stamped coated steel products)
IT 952598-91-3 1058743-89-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(main coating; method for manufg. stamped coated steel products)
IT 1173986-65-6 1173986-66-7, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. stamped coated steel products)
IT 1173986-77-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(superficial layer; method for manufg. stamped coated steel products)

L13 ANSWER 66 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2009:887389 CAPLUS Full-text
DOCUMENT NUMBER: 151:202846
TITLE: Method for manufacturing stamped coated steel products
INVENTOR(S): Drillet, Pascal; Spehner, Dominique; Kefferstein, Ronald
PATENT ASSIGNEE(S): ArcelorMittal France, Fr.
SOURCE: PCT Int. Appl., 27pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2009090443	A1	20090723	WO 2008-IB79	20080115
CA 2713685	A1	20090723	CA 2009-2713685	20090112
CA 2713685	C	20120320		
WO 2009090555	A1	20090723	WO 2009-IB322	20090112
KR 2010112602	A	20101019	KR 2010-7017170	20090112
EP 2242863	A1	20101027	EP 2009-701846	20090112
EP 2242863	B1	20140108		
CN 101910426	A	20101208	CN 2009-80102269	20090112
JP 2011512455	T	20110421	JP 2010-542705	20090112
JP 6146941	B2	20170614		
KR 2013008657	A	20130122	KR 2013-7000047	20090112
KR 1508861	B1	20150407		
RU 2499847	C2	20131127	RU 2010-134002	20090112
ES 2448551	T3	20140314	ES 2009-701846	20090112
CN 104651590	A	20150527	CN 2014-10799052	20090112
BR 2009007223	A2	20150714	BR 2009-7223	20090112
BR 2009007223	B1	20170606		
ZA 2010004497	A	20110330	ZA 2010-4497	20100625
MX 2010007428	A	20100903	MX 2010-7428	20100705
IN 2010CN04187	A	20110107	IN 2010-CN4187	20100706
IN 289869	B	20171201		
US 20110006491	A1	20110113	US 2010-834162	20100712
US 8733142	B2	20140527		
US 8066829	B2	20111129	US 2011-13118077	20110527
US 20120064362	A1	20120315	US 2011-13301403	20111121
US 8440323	B2	20130514		
JP 2017159364	A	20170914	JP 2017-40554	20170303
JP 6588047	B2	20191009		

PRIORITY APPLN. INFO.: WO 2008-IB79 A 20080115
CN 2009-80102269 A3 20090112

JP 2010-542705	A3	20090112
KR 2010-7017170	A3	20090112
WO 2009-IB322	W	20090112
US 2010-834162	A1	20100712

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention relates to a process for making a hot stamped coated steel sheet product. The methods comprises the steps of pre-coating a steel strip or sheet by aluminum or aluminum-iron-silicon alloy, cutting said pre-coated strip to obtain a pre-coated steel blank, heating the blank in a furnace preheated to a temp. and during a time defined by diagram according to thickness, at a heating rate Vc of 4-12°/s between 20 and 700° and at a heating rate Vc' of 1.5 and 6°/s between 500 and 700°, to obtain a heated blank. Further steps include transferring said heated blank to a die, hot stamping, cooling at a mean rate Vr of at least 30°/s between the exit of the heated blank from the furnace and down to 400°.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Kefferstein Ronald	2001			US 20010042393 A1	
Lorraine Laminage	2000			EP 0971044 A	CAPLUS
Nissan Motor	2004			EP 1380666 A	CAPLUS
Usinor	2003			FR 2833504 A	CAPLUS

IT 1173986-65-6
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. stamped coated steel products)

RN 1173986-65-6 CAPLUS

CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,Cu 0-0.1,Ni 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Cu	0 - 0.1	7440-50-8
Ni	0 - 0.1	7440-02-0
P	0 - 0.1	7723-14-0

IPCI C21D0008-02 [I]; C22C0038-32 [I]; C22C0038-38 [I]; B21D0053-26 [I]; C23C0002-12 [I]

IPCR C21D0008-02 [I]; B21D0053-26 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C23C0002-12 [I]

CC 55-11 (Ferrous Metals and Alloys)

ST steel aluminum coating hot stamping

IT Hot-dip coating process
(method for manufg. stamped coated steel products)

IT Metalworking
(stamping, hot; method for manufg. stamped coated steel products)

IT 1173986-67-8 1173986-72-5
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(interdiffusion layer; method for manufg. stamped coated steel products)

IT 1173986-68-9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermediate and superficial layers; method for manufg. stamped coated steel products)

IT 1173986-74-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermediate layer; method for manufg. stamped

coated steel products)
IT 1173986-70-3 1173986-76-9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(intermetallic layer; method for manufg. stamped coated steel products)
IT 952598-91-3 1058743-89-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(main coating; method for manufg. stamped coated steel products)
IT 1173986-65-6 1173986-66-7, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for manufg. stamped coated steel products)
IT 1173986-77-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(superficial layer; method for manufg. stamped coated steel products)
OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

L13 ANSWER 67 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2008:556603 CAPLUS Full-text
DOCUMENT NUMBER: 148:521251
TITLE: Coated steel strips, methods of making the same, methods of using the same, stamping blanks prepared from the same, stamped products prepared from the same, and articles of manufacture which contain such a stamped product
INVENTOR(S): Drillet, Pascal; Spehner, Dominique; Kefferstein, Ronald
PATENT ASSIGNEE(S): Arcelor France, Fr.
SOURCE: PCT Int. Appl., 43 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008053273	A1	20080508	WO 2006-IB4019	20061030
CA 2668393	A1	20080508	CA 2006-2668393	20061030
CA 2668393	C	20130813		
EP 2086755	A1	20090812	EP 2006-842403	20061030
EP 2086755	B1	20171129		
KR 2009086970	A	20090814	KR 2009-7008891	20061030
KR 1327648	B1	20131112		
CN 101583486	A	20091118	CN 2006-80056246	20061030
CN 101583486	B	20140827		
JP 2010508438	T	20100318	JP 2009-533969	20061030
JP 5334854	B2	20131106		
RU 2395593	C1	20100727	RU 2009-114832	20061030
BR 2006022071	A2	20140527	BR 2006-22071	20061030
EP 3290199	A1	20180307	EP 2017-192410	20061030
EP 3290199	B1	20190821		
EP 3290200	A1	20180307	EP 2017-192418	20061030
EP 3587104	A1	20200101	EP 2019-185736	20061030
EP 3587105	A1	20200101	EP 2019-185743	20061030
ES 2754621	T3	20200420	ES 2017-192410	20061030
ZA 2009002611	A	20101027	ZA 2009-2611	20090416
MX 2009004453	A	20090511	MX 2009-4453	20090424
IN 2009CN02275	A	20100319	IN 2009-CN2275	20090424
IN 324293	B	20191108		
US 20110165436	A1	20110707	US 2011-447777	20110318
US 20130029172	A1	20130131	US 2012-13621015	20120915
US 9708683	B2	20170718		
US 20170260603	A1	20170914	US 2017-15606770	20170526
US 10550447	B2	20200204		
US 20190271055	A1	20190905	US 2019-16413774	20190516

US 10590507 B2 20200317
US 20190271056 A1 20190905 US 2019-16413799 20190516
US 20190271057 A1 20190905 US 2019-16413825 20190516
US 20190271058 A1 20190905 US 2019-16414022 20190516
US 10597747 B2 20200324
US 20190276912 A1 20190912 US 2019-16413729 20190516
US 10577674 B2 20200303
PRIORITY APPLN. INFO.: EP 2006-842403 A3 20061030
EP 2017-192410 A3 20061030
WO 2006-IB4019 W 20061030
US 2011-447777 A3 20110318
US 2012-13621015 A1 20120915
US 2017-15606770 A1 20170526
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Coated steel having a well defined and uniform thickness is useful and advantageous for prepg. products by hot stamping. Products prepd. by hot stamping such a steel are particularly advantageous when subjected to a subsequent spot welding step.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Arcelor France	2006			WO 2006097593 A	CAPLUS
Armco Inc	1990			EP 0356783 A2	CAPLUS
Bhp Steel Jla Pty Ltd	2003			EP 1336666 A	CAPLUS
Laurent Jean-Pierre	2001			US 6296805 B1	CAPLUS
Lorraine Laminage	1995			FR 2720079 A1	CAPLUS
Lorraine Laminage	1998			FR 2758571 A1	CAPLUS
Lorraine Laminage	2000			EP 1013785 A1	CAPLUS

IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
RN 1022915-01-0 CAPLUS
CN Iron alloy, base, Fe 94-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	94 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

IPCI B32B0015-00 [I]; C21D0009-46 [I]
IPCR B32B0015-00 [I]; C21D0009-46 [I]
CC 55-11 (Ferrous Metals and Alloys)
ST aluminum coated steel strip stamping article spot welding
IT Metalworking
(stamping; aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
IT 7429-90-5, Aluminum, uses 952598-91-3, Aluminum 87-90, iron 2-4, silicon 8-11
RL: NUU (Other use, unclassified); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
IT 1022915-01-0
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aluminum coated steel strips stamping blanks and articles of manuf. which contain such a stamped product)
OS.CITING REF COUNT: 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

L13 ANSWER 68 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2006:322586 CAPLUS Full-text
DOCUMENT NUMBER: 144:354988
TITLE: Oxidation-resistant units and oxidation-resistant coating materials for turbines
INVENTOR(S): Yasutomi, Yoshiyuki; Kitaoka, Satoshi; Matsudaira, Tsuneaki; Kawashima, Naoki; Wada, Masashi; Sugita, Yuji; Kagitani, Yukio; Nakajo, Koji
PATENT ASSIGNEE(S): Fine Ceramics Center, Japan; Chubu Electric Power Co., Inc.
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006089796	A	20060406	JP 2004-275373	20040922
JP 4542857	B2	20100915		
PRIORITY APPLN. INFO.:			JP 2004-275373	20040922

AB The title unit is equipped with a structure body contg. an electron conducting region (R1) placed at oxidizing atm. side and an oxide layer placed at the oxidizing atm. side of R1, and a means for collecting neg. charge to R1. The region R1 may contain electron-conducting materials chosen from Ti, Ta, W, Ir, Pt-type alloys, heat-resistant steel contg. C 0-1, Si 0-3, Mn 0-2, Cr 0-30, Ni 0-50, Mo 0-10, W 0-8, Nb 0-5, Ti 0-5, Al 0-2, B 0-0.2, N 0-0.2, V 0-1, Cu 0-5, Zr 0-0.3 wt.%, Fe-based superalloys, Fe-Ni-Co-Cr alloys contg. C 0-0.5, Si 0-2, Mn 0-5, Cr 0-30, Ni 0-50, Co 0-50, Mo 0-10, W 0-8, Nb 0-5, Ti 0-5, Al 0-1, B 0-0.1, N 0-0.2, V 0-5, and Cu 0-5 wt.%, Co-based superalloys contg. C 0-1, Si 0-2, Mn 0-2, Ni 0-30, Cr 0-30, Mo 0-8, W 0-20, Nb 0-5, Ta 0-10, Ti 0-5, Al 0-0.5, Fe 0-5, B 0-0.5, Zr 0-2 wt.%, MCrAlR alloys (M = Ni, Co, and/or Fe; R = rare earth metals), TiC, TiN, TaC, TaN, LaCrO3, and LaCoO3. The unit provides high oxidn. resistance by ion blocking effects and elec. repulsion.

IT 881036-95-9 881036-96-0 881036-97-1
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; oxidn.-resistant units and coating materials having oxide surface for turbines)

RN 881036-95-9 CAPLUS
CN Iron alloy, base, Fe 0-100,Ni 0-50,Cr 0-30,Mo 0-10,W 0-8,Cu 0-5,Nb 0-5,Ti 0-5,Si 0-3,Al 0-2,Mn 0-2,C 0-1,V 0-1,Zr 0-0.3,B 0-0.2,N 0-0.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	0 - 100	7439-89-6
Ni	0 - 50	7440-02-0
Cr	0 - 30	7440-47-3
Mo	0 - 10	7439-98-7
W	0 - 8	7440-33-7
Cu	0 - 5	7440-50-8
Nb	0 - 5	7440-03-1
Ti	0 - 5	7440-32-6
Si	0 - 3	7440-21-3
Al	0 - 2	7429-90-5
Mn	0 - 2	7439-96-5
C	0 - 1	7440-44-0
V	0 - 1	7440-62-2
Zr	0 - 0.3	7440-67-7
B	0 - 0.2	7440-42-8
N	0 - 0.2	17778-88-0

RN 881036-96-0 CAPLUS
CN Iron alloy, base, Fe 0-100,Co 0-50,Ni 0-50,Cr 0-30,Mo 0-10,W 0-8,Cu 0-5,Mn 0-5,Nb 0-5,Ti 0-5,V 0-5,Si 0-2,Al 0-1,C 0-0.5,N 0-0.2,B 0-0.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	0	- 100	7439-89-6
Co	0	- 50	7440-48-4
Ni	0	- 50	7440-02-0
Cr	0	- 30	7440-47-3
Mo	0	- 10	7439-98-7
W	0	- 8	7440-33-7
Cu	0	- 5	7440-50-8
Mn	0	- 5	7439-96-5
Nb	0	- 5	7440-03-1
Ti	0	- 5	7440-32-6
V	0	- 5	7440-62-2
Si	0	- 2	7440-21-3
Al	0	- 1	7429-90-5
C	0	- 0.5	7440-44-0
N	0	- 0.2	17778-88-0
B	0	- 0.1	7440-42-8

RN 881036-97-1 CAPLUS
CN Cobalt alloy, base, Co 0-100,Cr 0-30,Ni 0-30,W 0-20,Ta 0-10,Mo 0-8,Fe 0-5,Nb 0-5,Ti 0-5,Mn 0-2,Si 0-2,Zr 0-2,C 0-1,Al 0-0.5,B 0-0.5 (9CI) (CA INDEX NAME)

Component	Component Percent		Component Registry Number
Co	0	- 100	7440-48-4
Cr	0	- 30	7440-47-3
Ni	0	- 30	7440-02-0
W	0	- 20	7440-33-7
Ta	0	- 10	7440-25-7
Mo	0	- 8	7439-98-7
Fe	0	- 5	7439-89-6
Nb	0	- 5	7440-03-1
Ti	0	- 5	7440-32-6
Mn	0	- 2	7439-96-5
Si	0	- 2	7440-21-3
Zr	0	- 2	7440-67-7
C	0	- 1	7440-44-0
Al	0	- 0.5	7429-90-5
B	0	- 0.5	7440-42-8

IPCI C23C0030-00 [I]; C22C0019-05 [I]; C22C0019-07 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C23F0013-00 [I]; F01D0005-28 [I]; F01D0025-00 [I]; F02C0007-00 [I]; C23C0030-00 [I]; C22C0019-05 [I]; C22C0019-07 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C23F0013-00 [I]; F01D0005-28 [I]; F01D0025-00 [I]; F02C0007-00 [I]
IPCR C23C0030-00 [I]; C22C0019-05 [I]; C22C0019-07 [I]; C22C0038-00 [I]; C22C0038-58 [I]; C23F0013-00 [I]; F01D0005-28 [I]; F01D0025-00 [I]; F02C0007-00 [I]
CC 56-10 (Nonferrous Metals and Alloys)
Section cross-reference(s): 55, 57
ST oxidn resistant oxide coating superalloy turbine
IT Turbines
(oxidn.-resistant units and coating materials having oxide surface for turbines)
IT Coating materials
(oxidn.-resistant; oxidn.-resistant units and coating materials having oxide surface for turbines)
IT Superalloys
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; oxidn.-resistant units and coating materials having oxide surface for turbines)
IT 7440-06-4, Platinum, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(neg. charge collector; oxidn.-resistant units and coating materials having oxide surface for turbines)
IT 1306-38-3, Ceria, uses 1309-48-4, Magnesia, uses 1314-20-1, Thorium oxide (ThO2), uses 1314-23-4, Zirconia, uses 1314-36-9, Yttria, uses 1314-61-0, Tantalum pentoxide 1344-28-1, Alumina, uses 12003-65-5, Aluminum lanthanum oxide (AlLaO3) 12004-39-6, Aluminum titanium oxide (Al2TiO5) 12055-23-1, Hafnia 13463-67-7, Titania, uses 97330-34-2, Beryllium oxide (BeO2)

RL: TEM (Technical or engineered material use); USES (Uses)
(oxidn.-resistant units and coating materials having oxide surface for turbines)

IT 7439-88-5, Iridium, uses 12016-86-3, Cobalt lanthanum oxide (CoLaO3) 12017-94-6, Chromium lanthanum oxide (CrLaO3) 12033-62-4, Tantalum nitride (TaN) 12070-06-3, Tantalum carbide (TaC) 12070-08-5, Titanium carbide (TiC) 25583-20-4, Titanium nitride (TiN) 73283-66-6, CoNiCrAlY 881036-95-9 881036-96-0 881036-97-1
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; oxidn.-resistant units and coating materials having oxide surface for turbines)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L13 ANSWER 69 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2006:31898 CAPLUS Full-text
DOCUMENT NUMBER: 144:132328
TITLE: Annular concentrically twisted bead cord
INVENTOR(S): Sasabe, Hiroshi; Wakahara, Hitoshi; Okamoto, Kenichi
PATENT ASSIGNEE(S): Sumitomo(Sei) Steel Wire Corp., Japan; Sumitomo Electric Tochigi Co. Ltd.
SOURCE: PCT Int. Appl., 29 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006004054	A1	20060112	WO 2005-JP12227	20050701
JP 2006062641	A	20060309	JP 2005-177763	20050617
JP 3779313	B2	20060524		
EP 1764238	A1	20070321	EP 2005-765284	20050701
EP 1764238	B1	20100414		
CN 101039811	A	20070919	CN 2005-80020724	20050701
CN 100572110	C	20091223		
EP 2213485	A1	20100804	EP 2009-13332	20050701
KR 2007043812	A	20070425	KR 2007-7002311	20070130
US 7735307	B2	20100615	US 2007-629490	20070712

PRIORITY APPLN. INFO.:

JP 2004-198329	A	20040705
JP 2004-224303	A	20040730
JP 2005-177631	A	20050617
JP 2005-177763	A	20050617
EP 2005-765284	A3	20050701
WO 2005-JP12227	W	20050701

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An annular concentrically twisted bead cord reduced in wt. and cost and improved in molding properties and annular core corrosive resistance. The annular core is formed of a medium carbon steel or an alloy steel obtained by suppressing carbon content and adding the proper amts. of specified elements thereto. The diam. (dc) of the annular core to the diam. (ds) of peripheral wires meets the requirement of the expression, $1.04 \leq dc/ds \leq 1.30$, and the peripheral wires with a coil diam. of 0.5 to 1.3 times the coil diam. of the annular core are used to provide the bead cord reduced in wt. and cost and improved in molding properties. Also, an Al-Zn alloy plating or a thick Zn plating layer is formed on the surface of the steel wire of the annular core or a stainless steel is used as the material of the annular core to increase the corrosive resistance of the annular core.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Fuji Seiko Kabushiki Ka	1989			JP 01-273707 A	
Fuji Seiko Kabushiki Ka	1992			JP 04-266506 A	
Kanai, H	1987			Microfilm of the spe	
Kobe Steel Ltd	1996			JP 08-188851 A	CAPLUS
Nippon Steel Corp	2001			JP 2001164337 A	CAPLUS
Nippon Steel Corp	2003			JP 2003129178 A	CAPLUS
Sumitomo Rubber Industr	2001			JP 2001301430 A	
Tokyo Rope Manufacturin	1993			JP 05-163686 A	

Toyo Tire And Rubber Co|1974 | | |GB 1466114 A |
Toyo Tire And Rubber Co|1974 | | |FR 2221290 A |
Toyo Tire And Rubber Co|1974 | | |DE 2405127 A |
Toyo Tire And Rubber Co|1974 | | |JP 49-102002 A |
Toyo Tire And Rubber Co|1975 | | |JP 50-131201 A |

IT 873188-74-0
RL: NUU (Other use, unclassified); USES (Uses)
(annular concentrically twisted bead cord)
RN 873188-74-0 CAPLUS
CN Iron alloy, base, Fe 93-99,Mn 0.5-2,Si 0.3-2,Cr 0.2-2,C 0.1-0.3,Al 0-0.1,B 0-0.1,Mg 0-0.1,Nb 0-0.1,Ti 0-0.1,V 0-0.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	93 - 99	7439-89-6
Mn	0.5 - 2	7439-96-5
Si	0.3 - 2	7440-21-3
Cr	0.2 - 2	7440-47-3
C	0.1 - 0.3	7440-44-0
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
Mg	0 - 0.1	7439-95-4
Nb	0 - 0.1	7440-03-1
Ti	0 - 0.1	7440-32-6
V	0 - 0.1	7440-62-2

IPCI B60C0015-04 [ICM,7]; B60C0009-00 [ICS,7]; C22C0038-00 [ICS,7]; C22C0038-18 [ICS,7]; C22C0038-54 [ICS,7]; D07B0001-06 [ICS,7]
CC 55-3 (Ferrous Metals and Alloys)
ST steel annular concentrically twisted bead cord aluminum zinc coating
IT Coating materials
Cords
(annular concentrically twisted bead cord)
IT 11107-04-3 11109-50-5 11121-90-7, Carbon steel, uses 12597-68-1, Stainless steel, uses 12597-69-2, Steel, uses 12709-14-7, uses 12709-21-6, uses 37261-75-9, uses 39286-11-8, uses 873188-71-7, uses 873188-72-8, uses 873188-73-9, uses 873188-74-0
RL: NUU (Other use, unclassified); USES (Uses)
(annular concentrically twisted bead cord)
IT 7440-66-6, Zinc, uses 11149-84-1
RL: NUU (Other use, unclassified); USES (Uses)
(coating; annular concentrically twisted bead cord)
OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (10 CITINGS)

L13 ANSWER 70 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2001:916938 CAPLUS Full-text
DOCUMENT NUMBER: 136:72669
TITLE: Acceleration of diffusion saturation processes in nonisothermal thermochemical treatment
AUTHOR(S): Gyulikhandanov, E. L.; Khaidorov, A. D.
CORPORATE SOURCE: St. Petersburg State Technical University, St. Petersburg, Russia
SOURCE: Metal Science and Heat Treatment (Translation of Metallovedenie i Termicheskaya Obrabotka Metallov) (2001), 43(5-6), 228-232
CODEN: MHTRAN; ISSN: 0026-0673
PUBLISHER: Kluwer Academic/Consultants Bureau
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Various of nonisothermal processes of carburizing, nitrocarburizing, and nitriding were studied. The steels 20KhGNR, 40Kh, and 40KhMFA were investigated. The diffusion satn. were performed by carburizing with an additive of 5% NH3, high-temp. nitrocarburizing in a mixt. of 50% natural gas and 50% NH3, and nitriding in NH3. In all the cases thermochem. treatment (TCT) was not conducted by preliminary heat treatment. The thickness of the diffusion layers and their structure and properties were detd. The measurement of the diffusion layers involved in low-temp. nitrocarburizing and nitriding was carried out by durometry. It

was assumed that the boundary between the layer and the core had a microhardness of 300 HV and exceeded somewhat the hardness of the core of the studied steels. The efficiency of nonisothermal and combined TCT multiplicity of the growth of the layer equal to the ratio of the effective thickness of the layers obtained in nonisothermal and isothermal regimes. Using combined regimes of thermochem. treatment that included thermocycling and isothermal stages, a substantial acceleration of the diffusion process was detected which increased considerably the thickness of the diffusion layer. A method was suggested that enabled to calc. the kinetics of nonisothermal processes of TCT according to the model of single-phase diffusion with the use of effective diffusivities.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Gyulikhandanov, E	1992		2	Metalloved Term Obra	
Shmykov, A	1991			Thermodynamics and K	

IT 37312-00-8, 20KhGNR
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(diffusion satn. processes in nonisothermal thermochem. treatment of steel)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 97	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST steel carburizing nitrocarburizing nitriding microstructure diffusion
IT Carbonitriding
Carburizing
Diffusion
Nitriding
(diffusion satn. processes in nonisothermal thermochem. treatment of steel)
IT Microstructure
(diffusion satn. processes in nonisothermal thermochem. treatment of steel in relation to)
IT 37312-00-8, 20KhGNR 39344-94-0, 40Kh, processes 64721-16-0, 40KhMFA
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(diffusion satn. processes in nonisothermal thermochem. treatment of steel)
IT 7664-41-7, Ammonia, uses
RL: NUU (Other use, unclassified); USES (Uses)
(diffusion satn. processes in nonisothermal thermochem. treatment of steel in relation to use of)

L13 ANSWER 71 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2000:113096 CAPLUS Full-text
DOCUMENT NUMBER: 132:230489
TITLE: Equipment for nitriding in pulsating current plasma

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Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

AUTHOR(S): Dostanko, A. P.; Bosyakov, M. N.; Bondarenko, S. V.; Grunskii, D. I.; Zhuk, D. V.; Kukharev, S. A.; Matusevich, P. A.; Savilov, A. V.
CORPORATE SOURCE: Beloruss. Gos. Univ. Inform. i Radioelektron., Minsk, 220027, Belarus
SOURCE: Elektronnaya Obrabotka Materialov (1999), (3), 66-69
CODEN: EOBMAF; ISSN: 0013-5739
PUBLISHER: Institut Prikladnoi Fiziki AN Respubliki Moldova
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The characteristics of the installation for hardening ion nitriding treatment in plasma of a pulsating current are adduced. The main advantages of processing in pulsating plasma with ref. to constructional and tool steels in comparison with gas nitriding are discussed. The summary table for different types of processed details., marks of steels, and characteristics of nitriding layer - depth and surface hardness is adduced.
IT 12742-15-3, 20KhNR
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(equipment for nitriding in pulsating current plasma of steels and coating properties)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 98	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.60 - 0.90	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 76-11 (Electric Phenomena)
Section cross-reference(s): 55
ST equipment nitriding pulsating current plasma steel
IT Apparatus
Coating materials
Hardness (mechanical)
Plasma nitriding
(equipment for nitriding in pulsating current plasma of steels and coating properties)
IT 7440-37-1, Argon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(equipment for nitriding in pulsating current plasma of steels and coating properties)
IT 1333-74-0, Hydrogen, processes 7727-37-9, Nitrogen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(equipment for nitriding in pulsating current plasma of steels and coating properties)
IT 12604-95-4, 38KhMYuA 12631-59-3, 40KhN2MA 12681-03-7, 20KhN3A 12718-23-9, 18KhGT 12725-23-4, R6M5 12731-80-5, 38KhMA, properties 12741-57-0, 4Kh5MFS 12741-70-7, Kh 12 12741-98-9, 25KhGT 12742-00-6, Kh12M 12742-05-1, 40KhN 12742-15-3, 20KhNR 12742-29-9, 4Kh5V2FS 12773-74-9, 35KhGSA 12784-22-4, 12Kh2N4A 37203-00-2, 4Kh4VMFS 37245-26-4, 30Kh13 37268-90-9, Steel 45, properties 37311-99-2, 40KhGNM 37323-42-5, 30KhGT 37323-91-4, 5KhNM 37329-39-8, 20Kh, properties 37329-44-5, R9K10 37360-28-4, 3Kh2V8 39344-94-0, 40Kh, properties 50947-86-9, 40Kh9S2 54790-83-9, 55Kh20G9AN4 61431-72-9, 15KhGN2TA 67540-49-2, 3Kh3M3F 68445-91-0, 20KhGNMTA

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72026-34-7, 15KhF, properties 83653-82-1, 5KhNMF
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(equipment for nitriding in pulsating current plasma of steels and coating properties)

L13 ANSWER 72 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 2000:34644 CAPLUS Full-text
DOCUMENT NUMBER: 132:96225
TITLE: Coated hot-rolled and cold-rolled steel sheet with high strength and corrosion resistance after heat treatment
INVENTOR(S): Laurent, Jean-Pierre; Devroc, Jacques; Hennechart, Jean-Paul; Spehner, Dominique; Laminage, Lorraine
PATENT ASSIGNEE(S): Sollac, Fr.
SOURCE: Eur. Pat. Appl., 7 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 971044	A1	20000112	EP 1999-401690	19990707
EP 971044	B1	20030514		
FR 2780984	A1	20000114	FR 1998-8793	19980709
FR 2780984	B1	20010622		
CA 2276911	A1	20000109	CA 1999-2276911	19990707
CA 2276911	C	20090505		
AT 240419	T	20030515	AT 1999-401690	19990707
PT 971044	E	20030829	PT 1999-401690	19990707
ES 2196740	T3	20031216	ES 1999-401690	19990707
BR 9902712	A	20000308	BR 1999-2712	19990708
JP 2000038640	A	20000208	JP 1999-195664	19990709
JP 3931251	B2	20070613		
US 6296805	B1	20011002	US 1999-350100	19990709
US 44153	E1	20130416	US 2011-13205126	20110808
US 44940	E1	20140610	US 2013-13863100	20130415

PRIORITY APPLN. INFO.:
FR 1998-8793 A 19980709
US 1999-350100 E 19990709
US 2011-13205126 A1 20110808
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB A hot-rolled and cold-rolled steel sheet contg. C 0.15-0.5, Mn 0.5-3, Si 0.1-0.5, Cr 0.01-1, Ti ≤0.2, Al ≤0.1, P ≤0.1, S ≤0.05, and B 0.0005-0.08% is coated in a molten Al bath, heated at 5-600°/s, and annealed above 750°. The coated sheet has a high strength, shock-, fatigue-, abrasion-, wear-, and corrosion resistance, and adhesion to paints and adhesives.
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1989			JP 01176056 A	CAPLUS
Anon	1989			FR 2625227 A	CAPLUS
Anon	1990			JP 02263954 A	CAPLUS
Anon	1993			JP 05247588 A	CAPLUS
Anon	1993			GB 2261879 A	CAPLUS
Anon	1993			FR 2684392 A	CAPLUS
Anon	1993			DE 4143270 A	CAPLUS
Anon	1993			US 5178688 A	CAPLUS
Anon	1994			JP 06179944 A	CAPLUS
Anon	1994			JP 6093375 A	
Anon	1994			KR 9402139 B	
Anon	1995			IT 1252862 B	
Anon	1995			JP 7062212 B	
Anon	1996			JP 2034275 C	
Anon	1997			JP 2686755 B	

IT 254455-64-6
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum-coated hot-rolled and cold-rolled steel sheet with high strength and corrosion resistance)

RN 254455-64-6 CAPLUS
CN Iron alloy, base, Fe 95-99,Mn 0.5-3,Cr 0-1,C 0.2-0.5,Si 0.1-0.5,Ti 0-0.2,Al 0-0.1,B 0-0.1,P 0-0.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 99	7439-89-6
Mn	0.5 - 3	7439-96-5
Cr	0 - 1	7440-47-3
C	0.2 - 0.5	7440-44-0
Si	0.1 - 0.5	7440-21-3
Ti	0 - 0.2	7440-32-6
Al	0 - 0.1	7429-90-5
B	0 - 0.1	7440-42-8
P	0 - 0.1	7723-14-0

IPCI C22C0038-32 [ICM,6]
IPCR C23C0002-12 [I]; C21D0008-02 [I]; C22C0038-00 [I]; C22C0038-32 [I]; C22C0038-38 [I]; C23C0002-28 [I]; C23C0030-00 [I]
CC 55-3 (Ferrous Metals and Alloys)
ST aluminum coated steel sheet
IT Coating process
(hot-dipping; of hot-rolled and cold-rolled steel sheet with aluminum alloy)
IT 110107-84-1, uses 254455-64-6
RL: TEM (Technical or engineered material use); USES (Uses)
(aluminum-coated hot-rolled and cold-rolled steel sheet with high strength and corrosion resistance)
IT 37296-00-7 254455-65-7
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(coating of hot-rolled and cold-rolled steel sheet with)
OS.CITING REF COUNT: 16 THERE ARE 16 CAPLUS RECORDS THAT CITE THIS RECORD (19 CITINGS)

L13 ANSWER 73 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1999:474181 CAPLUS Full-text
DOCUMENT NUMBER: 131:274752
TITLE: Effect of electrode drying conditions and preheating temperature on cold cracking in welded joints of low-alloy high-resistance coated-electrode electric-arc steels
AUTHOR(S): da Silva, Paulo Guedes; Maciel, Theophilo Moura
CORPORATE SOURCE: Centro de Ciencias e Tecnologia, Universidade Federal da Paraiba - UFPb, Brazil
SOURCE: Congresso Anual - Associacao Brasileira de Metalurgia e Materiais (1998), Volume Date 1997, 52nd(II Congresso Internacional de Tecnologia Metalurgica e de Materiais), 4358-4368
CODEN: CAAMEU
PUBLISHER: Associacao Brasileira de Metalurgia e Materiais
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: Portuguese
AB The effects of the electrode moisture level and of the cooling rate on the cold cracking of welded joints of HSLA steels was evaluated. The shielded metal arc Welding process was employed. The weld deposits were made with AWS E 12018-G electrode, using the SAR 120 T (ASTM 514 B) as steel base metal. The cooling rate was varied by varying the pre-heating temp. and the moisture level was varied by varying the electrode redried time. The results obtained indicated a significative redn. on the cracks with the increase of the pre-heating temp. and with the increases of the redried times, without signification changes at the weld metal microstructure and hardness. The absence of cracks was found for welds deposited with pre-heating above 180 °C and with electrodes redried for 2 h at 240 °C.
IT 52346-86-8, ASTM A514B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using

high-resistance coated-electrode elec.-arc welding fillers)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)
ST steel weld cracking electrode drying preheating
IT Drying
Humidity
(effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)
IT Welding of metals
(electrodes; effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)
IT Welding of metals
(shielded metal arc; effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)
IT 52346-86-8, ASTM A514B, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)
IT 12597-69-2, Steel, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(welded; effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)
IT 154804-42-9, AWS E12018G
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(welding electrode; effect of electrode drying conditions and preheating temp. on cold cracking in welded joints of low-alloy steel using high-resistance coated-electrode elec.-arc welding fillers)

L13 ANSWER 74 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1997:607427 CAPLUS Full-text
DOCUMENT NUMBER: 127:296559
ORIGINAL REFERENCE NO.: 127:57923a,57926a
TITLE: Nondestructive testing of carburizing
AUTHOR(S): Bochenin, V. I.; Burnakov, K. K.
CORPORATE SOURCE: Kurgan. Gos. S-kh. Akad. im. Mal'tseva, Kurgan, Russia
SOURCE: Vestnik Mashinostroeniya (1997), (3), 31-33
CODEN: VMASAV; ISSN: 0042-4633
PUBLISHER: Mashinostroenie
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB A nondestructive testing technique is developed for the detn. of the depth of a carburized layer. It consists in γ-quantum narrow-beam examn. of a controlled medium material and detn. of the degree of photon absorption in different layers of the product surface, the C amt. being

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detected based on the γ-phase content. The results of exptl. testing conducted on three different steels showed a little discrepancy between the new technique and conventionally used chem. anal.

IT 37312-00-8, 20KhGNR
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(nondestructive testing of carburized layer depth in steel carburizing)

RN 37312-00-8 CAPLUS

CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
Section cross-reference(s): 79

ST steel carburization carbon distribution nondestructive testing

IT Carburizing
(nondestructive testing of carburized layer depth in steel carburizing)

IT Testing of materials
(nondestructive; nondestructive testing of carburized layer depth in steel carburizing)

IT 12742-08-4, 20Kh2N4A 12742-21-1, 18Kh2N4VA 37312-00-8, 20KhGNR
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(nondestructive testing of carburized layer depth in steel carburizing)

L13 ANSWER 75 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 1991:147833 CAPLUS Full-text
DOCUMENT NUMBER: 114:147833
ORIGINAL REFERENCE NO.: 114:24995a,24998a
TITLE: Development of technology for electrospark hardening of steel steam turbine parts
AUTHOR(S): Skoblo, T. S.; Sidenko, V. N.; Tripolko, V. K.; Rudyuk, A. S.
CORPORATE SOURCE: USSR
SOURCE: Tyazheloe Mashinostroenie (1990), (7), 25-6
CODEN: TYMAEZ; ISSN: 1024-7106
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB The valves of steam turbine distributor made from 20Kh1M1F1TR were hardened by electrospark treatment using electrodes from 40Kh13, 1Kh18N10T, and KhN77TYuR. The max. increase of wear resistance was obtained for 1Kh18N10T electrode: the wear resistance increases 1.8-fold compared with that of nitrided parts. After holding in air at 540° for 1000 h, no corrosion was obsd. at the hardened surface; the hardness and depth of the layer were unaffected by the holding.

IT 37311-91-4, 20Kh1M1F1TR
RL: USES (Uses)
(steam turbine parts from, electrospark hardening of)

RN 37311-91-4 CAPLUS

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CN Iron alloy, base, Fe 95-98,Cr 0.90-1.40,Mo 0.80-1.10,V 0.70-1.00,Mn 0-0.50,Si 0-0.37,Cu 0-0.30,Ni 0-0.30,C 0.17-0.24,Ti 0.05-0.12,P 0-0.030,S 0-0.030,B 0.005 (20Kh1M1F1TR) (9CI) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Cr	0.90	-	1.40	7440-47-3
Mo	0.80	-	1.10	7439-98-7
V	0.70	-	1.00	7440-62-2
Mn	0	-	0.50	7439-96-5
Si	0	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
Ni	0	-	0.30	7440-02-0
C	0.17	-	0.24	7440-44-0
Ti	0.05	-	0.12	7440-32-6
P	0	-	0.030	7723-14-0
S	0	-	0.030	7704-34-9
B	0.005			7440-42-8

CC 55-9 (Ferrous Metals and Alloys)
Section cross-reference(s): 47
ST electrospark hardening steel steam turbine; electrode electrospark hardening steel turbine
IT Electric spark
(hardening by, of high-temp. steel parts for steam turbines)
IT Turbines
(steam, parts, from pearlitic high-temp. steel, electrospark hardening of, electrodes for)
IT 12719-18-5, KhN77TYuR 39412-98-1, 40Kh13 54611-20-0, 1Kh18N10T
RL: USES (Uses)
(electrode, for electrospark hardening of steam turbine parts from pearlitic high-temp. steel)
IT 37311-91-4, 20Kh1M1F1TR
RL: USES (Uses)
(steam turbine parts from, electrospark hardening of)

L13 ANSWER 76 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1990:518966 CAPLUS Full-text
DOCUMENT NUMBER: 113:118966
ORIGINAL REFERENCE NO.: 113:20121a,20124a
TITLE: Role of thermally hardened layers obtained by laser treatment in the wear resistance of contact pairs during fretting corrosion
AUTHOR(S): Dorozhkin, N. N.; Dubnyakov, V. N.; Kukin, S. F.; Pasakh, E. V.
CORPORATE SOURCE: PO Minsk. Trakt. Zavod, Minsk, USSR
SOURCE: Trenie i Iznos (1990), 11(2), 264-9
CODEN: TRIZD6; ISSN: 0202-4977
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Fretting corrosion tests of steel 20KhNP and cast iron SCh20 after laser hardening showed that the wear intensity of the metastable surface structure of the steel is 1/5th and that of the gray iron is 1/3rd of the values obtained for nonhardened materials. Surface deformation during the frictional interaction facilitates phase transformation in the metastable structure ensuring an increase in ductility at high values of hardness, which results in an increase in the wear resistance of the laser-hardened steel and cast iron during fretting corrosion.
IT 12742-15-3
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(laser hardening of, fretting corrosion in relation to)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-10 (Ferrous Metals and Alloys)
ST laser hardening steel fretting corrosion; cast iron laser hardening corrosion
IT 12742-15-3 72645-39-7, SCh20
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(laser hardening of, fretting corrosion in relation to)

L13 ANSWER 77 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1987:71034 CAPLUS Full-text
DOCUMENT NUMBER: 106:71034
ORIGINAL REFERENCE NO.: 106:11649a,11652a
TITLE: A nondestructive measurement of residual bulk stresses in welded steel specimens by use of magnetically induced velocity changes for ultrasonic waves
AUTHOR(S): Kwun, Hegeon
CORPORATE SOURCE: Nondestr. Eval. Sci. Technol. Div., Southwest Res. Inst., San Antonio, TX, USA
SOURCE: Materials Evaluation (1986), 44(13), 1560-6
CODEN: MAEVAD; ISSN: 0025-5327
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The distributions of residual bulk stresses in butt-welded ASTM A-588 [63849-06-9] steel and a T-shaped full-penetration-welded ASTM A514 [63747-69-3] steel were nondestructively measured by use of magnetically induced velocity changes (MIVC) for longitudinal and shear waves. The stress effects on MIVC obsd. under various uniaxial stress conditions were used to det. the residual bulk stresses. The results agree with stress values detd. by a layer-removal technique. The MIVC method may be developed to measure biaxial and triaxial stress states.
IT 52346-86-8, properties
RL: PRP (Properties)
(residual stresses in welded, detn. by magnetically induced velocity changes for ultrasonic waves)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)
IT Welds
(steel, residual bulk stresses in, detn. by magnetically induced velocity changes for ultrasonic waves)
IT 52346-86-8, properties 61299-90-9, properties

RL: PRP (Properties)
(residual stresses in welded, detn. by magnetically induced velocity changes for ultrasonic waves)
IT 12597-69-2
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(welds, steel, residual bulk stresses in, detn. by magnetically induced velocity changes for ultrasonic waves)

L13 ANSWER 78 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1986:190490 CAPLUS Full-text
DOCUMENT NUMBER: 104:190490
ORIGINAL REFERENCE NO.: 104:30111a,30114a
TITLE: Structure and properties of a boronized layer of carbon and low-alloy steels from high-frequency current heating
AUTHOR(S): Zozulya, V. F.; Pavlyuchenko, A. A.; Legeida, V. N.
CORPORATE SOURCE: USSR
SOURCE: Vestn. Khar'k. Politekhn. In-ta (1985), (255), 42-4
From: Ref. Zh., Metall. 1986, Abstr. No. 2E285
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Title only translated.
IT 37311-91-4
RL: PRP (Properties)
(structure of boronized layer in, high-frequency heating in relation to)
RN 37311-91-4 CAPLUS
CN Iron alloy, base, Fe 95-98,Cr 0.90-1.40,Mo 0.80-1.10,V 0.70-1.00,Mn 0-0.50,Si 0-0.37,Cu 0-0.30,Ni 0-0.30,C 0.17-0.24,Ti 0.05-0.12,P 0-0.030,S 0-0.030,B 0.005 (20Kh1M1F1TR) (9CI) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Cr	0.90	-	1.40	7440-47-3
Mo	0.80	-	1.10	7439-98-7
V	0.70	-	1.00	7440-62-2
Mn	0	-	0.50	7439-96-5
Si	0	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
Ni	0	-	0.30	7440-02-0
C	0.17	-	0.24	7440-44-0
Ti	0.05	-	0.12	7440-32-6
P	0	-	0.030	7723-14-0
S	0	-	0.030	7704-34-9
B	0.005			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST steel boronized layer structure; heating high frequency boronizing steel
IT Boronizing
(of steel, carbon- and low-alloy, high-frequency heating effect on diffusion layer structure in)
IT 12651-65-9, properties 12725-36-9, properties 37311-91-4
RL: PRP (Properties)
(structure of boronized layer in, high-frequency heating in relation to)

L13 ANSWER 79 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1986:113747 CAPLUS Full-text
DOCUMENT NUMBER: 104:113747
ORIGINAL REFERENCE NO.: 104:17971a,17974a
TITLE: Cavitation-resistant diffusion layers on low-alloy steels
AUTHOR(S): Abacharaev, M. M.
CORPORATE SOURCE: Dagest. Politekh. Inst., Makhachkala, USSR
SOURCE: Zashchitnye Pokrytiya na Metallakh (1985), 19, 15-18
CODEN: ZPMEAC; ISSN: 0514-5864
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB A new criterion was developed for evaluation of the cavitation resistance of diffusion-coated low-alloy steels. The criterion was used in detn. of the cavitation resistance of quenched, Ti- and Mn-cemented, chromized, or chromized and cemented steels 20KhNR [12743-15-3], 40KhN [12742-05-1], and 38Kh2MYuA [12604-95-4]. The exptl. study and an anal. evaluation of steel cavitation resistance showed good coincidence using the criterion. The highest range of cavitation resistance was recorded for Cr + Mn-satd. steel 40KhN, Cr + Ti-satd. steel 20KhNR, and chromized steel 38Kh2MYuA.

IT 12743-15-3
RL: USES (Uses)
(cavitation-resistance of diffusion-satd., criterion for evaluation of)

RN 12742-15-3 CAPLUS

CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)

ST steel diffusion coating cavitation resistance; criterion steel cavitation resistance evaluation; chromizing steel cavitation resistance; manganese cementation steel cavitation resistance; titanium cementation steel cavitation resistance

IT Chromizing
(of low-alloy steel, cavitation resistance by, criterion for evaluation of)

IT Cavitation
(resistance of low-alloy diffusion-satd. steel to, criterion for evaluation of)

IT 12604-95-4 12742-05-1 12743-15-3
RL: USES (Uses)
(cavitation-resistance of diffusion-satd., criterion for evaluation of)

IT 7439-96-5, reactions 7440-32-6, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(cementation of low-alloyed steels with, cavitation resistance by, criterion for evaluation of)

L13 ANSWER 80 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 1985:581691 CAPLUS Full-text

DOCUMENT NUMBER: 103:181691

ORIGINAL REFERENCE NO.: 103:29223a,29226a

TITLE: Study of a dark constituent in carbonitridation layers

AUTHOR(S): Shapochkin, V. I.; Semenova, L. M.

CORPORATE SOURCE: VPO "VNIITMASh", Volgograd, USSR

SOURCE: Izvestiya Vysshikh Uchebnykh Zavedenii, Chernaya Metallurgiya (1985), (5), 125-9
CODEN: IVUMAX; ISSN: 0368-0797

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB Low-alloy steels such as 20Kh [37329-39-8], 40Kh [39344-94-0], 25KhGT [12741-98-9], 25KhGM [51433-85-3], etc., were carbonitrided to 0.9-1.1% C and 0.4-0.5% N content in a 0.05 mm-deep layer. A dark constituent of the carbonitrided layer was studied by metallog., electron microscopy, and physicochem. anal. Pptn. of irregular-shaped inclusions surrounded by

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an easily etched zone, which usually crumbles during specimen prepn., was related to formation of the dark constituent.

IT 12742-15-3 37312-00-8 56995-50-7,
reactions
RL: USES (Uses)
(carbonitriding of, defect structure formation in)

RN 12742-15-3 CAPLUS

CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

RN 37312-00-8 CAPLUS

CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

RN 56995-50-7 CAPLUS

CN Iron alloy, base, Fe 96-98,Cr 0.75-1.05,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,Ni 0-0.30,C 0.18-0.24,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Cr	0.75	-	1.05	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
Ni	0	-	0.30	7440-02-0
C	0.18	-	0.24	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9

Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST steel carbonitriding defect structure ppt
IT Carbonitridation and Cyanidation
(of low-alloy steels, defect structure formation in)
IT 12681-03-7 12741-98-9, reactions 12742-08-4 12742-15-3
37312-00-8 37329-39-8, reactions 39344-94-0, reactions
51433-85-3, reactions 56995-50-7, reactions 66772-46-1
92049-05-3
RL: USES (Uses)
(carbonitriding of, defect structure formation in)

L13 ANSWER 81 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1984:495400 CAPLUS Full-text
DOCUMENT NUMBER: 101:95400
ORIGINAL REFERENCE NO.: 101:14571a,14574a
TITLE: Thermochemical treatment of steel parts in continuous furnaces with automatic control of carbon potential
AUTHOR(S): Kirnos, I. V.; Klyshnikov, S. T.; Kukui, B. G.; Lobachev, I. A.; Pegisheva, S. A.; Radzievskii, B. V.
CORPORATE SOURCE: VNIITMASh, USSR
SOURCE: Metallovedenie i Termicheskaya Obrabotka Metallov (1984), (4), 24-8
CODEN: MTOMAX; ISSN: 0026-0819
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB A continuous furnace for steel carburization was developed. A math. model was used for automatic control of the carburization process by monitoring the C potential and moisture content of the furnace atm. Tests were made on steels 20KhNR [12742-15-3] and 25KhGT [12741-98-9]. Good agreement of calcd. and exptl. data for C distribution in the hardened layers, related to process parameters, was obtained.
IT 12742-15-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in continuous furnace, control of, model for)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST steel carburization continuous furnace control; model steel carburization furnace control
IT Furnaces
(continuous, for steel carburization, control of, model for)
IT Controlled atmospheres
(in continuous furnace for steel carburization)
IT Process simulation, physicochemical
(of carburization of steel in continuous process)
IT Carburizing

(of steel, in continuous furnace, control of, model for)
IT 12741-98-9, reactions 12742-15-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in continuous furnace, control of, model for)

L13 ANSWER 82 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1984:495398 CAPLUS Full-text
DOCUMENT NUMBER: 101:95398
ORIGINAL REFERENCE NO.: 101:14570h,14571a
TITLE: Thermocyclic carbonitridation of gears
AUTHOR(S): Bashnin, Yu. A.; Semenova, L. M.; Burenkova, O. S.; Borodova, I. A.; Ban'kovskii, A. I.
CORPORATE SOURCE: VNIITMASh, USSR
SOURCE: Metallovedenie i Termicheskaya Obrabotka Metallov (1984), (4), 14-15, 1 plate
CODEN: MTOMAX; ISSN: 0026-0819
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Tractor gears were made from steels 25KhGT [12741-98-9] and 20KhGNR [37312-00-8], and carbonitrided in a furnace with endothermic atm. using thermocycling (heating to 880° and cooling in controlled amt.). The effect of the thermocycling on contact-fatigue strength of hardened gears was studied in comparison with conventional thermochem. treatments (isothermal carbonitridation or carburization). It was found that thermocycle-treated steels had the same amt. of C and N in hardened layers, but had lower amt. of residual austenite, smaller martensite needles, and finer carbonitride particles. Durability of thermocycle-treated gears was 2.5 times that of conventionally treated ones.
IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation of, for tractor wear, thermocycling in, structure and mech. properties and wear resistance in relation to)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
IT Carbonitridation and Cyanidation
(of steel, for tractor gears, thermocycling in, structure and mech. properties and wear resistance in relation to)
IT Tractors
(steel parts for, carbonitridation of, thermocycling in, structure and mech. properties and wear resistance in relation to)
IT Gears
(steel, for tractors, carbonitridation of, thermocycling in, structure and mech. properties and wear resistance in relation to)
IT 12741-98-9, reactions 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation of, for tractor wear, thermocycling in, structure and mech. properties and wear resistance in relation to)

L13 ANSWER 83 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1983:526476 CAPLUS Full-text
DOCUMENT NUMBER: 99:126476
ORIGINAL REFERENCE NO.: 99:19427a,19430a
TITLE: Types of bainite in carburized layers of gears, hardness and effective thickness of layers containing bainite
AUTHOR(S): Susin, A. A.; Aleksandrov, B. I.; Val'ko, A. L.
CORPORATE SOURCE: USSR
SOURCE: Poverkh. Metody Uprochneniya Met. i Splavov v Mashinostr. Materialy Seminara, M. (1983) 32-6
From: Ref. Zh., Metall. 1983, Abstr. No. 8I1029
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Title only translated.
IT 12742-15-3
RL: USES (Uses)
(case carburization of gear, bainite morphol. in)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)
ST carburizing gear steel bainite
IT Carburizing
(of steel gears, for case hardening, bainite morphol. in)
IT Gears
(steel, case carburization of, bainite morphol. in)
IT 12742-15-3
RL: USES (Uses)
(case carburization of gear, bainite morphol. in)
IT 12427-23-5
RL: PRP (Properties)
(morphol. of, in case-carburized steel gears)

L13 ANSWER 84 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1983:408990 CAPLUS Full-text
DOCUMENT NUMBER: 99:8990
ORIGINAL REFERENCE NO.: 99:1493a,1496a
TITLE: Ion nitriding behavior of several low alloy steels
AUTHOR(S): Robino, C. V.; Inal, O. T.
CORPORATE SOURCE: Dep. Metall. Mater. Eng., New Mexico Inst. Min. Technol., Socorro, NM, 87801, USA
SOURCE: Materials Science and Engineering (1983), 59(1), 79-90
CODEN: MSCEAA; ISSN: 0025-5416
DIGITAL OBJECT ID: 10.1016/0025-5416(83)90090-3
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The ion nitriding of several low-alloy steels, U.S. Steel T1 type A [52346-86-8], AISI 4140 [12672-16-1], AISI 6150 [39370-53-1], and Nitralloy 135M [61333-12-8], was examd. under varying process conditions

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using microhardness-depth correlations, friction and wear measurements, and optical and transmission electron microscopy. The process variables included time (2-4 h) and temp. (400-600°). All 4 steels exhibited a diffusion layer case growth rate which was dependent on the square root of the exposure time. The highest nitrided hardnesses and lowest case depths were obsd. in the Nitralloy 135M steel while the lowest hardnesses and highest case depths in the T1 steel. The behaviors of the T1, AISI 4140, and 6150 steels were similar. The white layer thickness was independent of the material and increased with increasing time. Both the case depth and the white layer thickness increased strongly with temp. while the hardness decreased. Only slight differences arise in the bulk structure during nitriding. Nitriding produces platelet or disk ppts. approx. 5-20 nm across on {001} matrix planes. These platelets show a striated morphol. which is the result of strain within the matrix. Electron microscopy showed tempering to continue in the core region during nitriding. The wear resistance of the steels increased by factors of 3.7-8.5 by nitriding. The coeff. of friction increased in the nitrided samples.

IT 52346-86-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(ion nitridation of)

RN 52346-86-8 CAPLUS

CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-7 (Ferrous Metals and Alloys)

ST nitriding ion steel wear

IT Plasma nitriding
(of steels, low-alloy)

IT 12672-16-1, reactions 39370-53-1, reactions 52346-86-8, reactions 61333-12-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(ion nitridation of)

OS.CITING REF COUNT: 27 THERE ARE 27 CAPLUS RECORDS THAT CITE THIS RECORD (27 CITINGS)

L13 ANSWER 85 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 1982:601438 CAPLUS Full-text

DOCUMENT NUMBER: 97:201438

ORIGINAL REFERENCE NO.: 97:33693a,33696a

TITLE: The use of controlled 20 and 40% hydrogen atmospheres in cementation and carbonitridation

AUTHOR(S): Tikhonov, A. K.; Sheindlin, B. E.; Chaikovskii, S. Z.; Krishtal, M. A.

CORPORATE SOURCE: Volgogr. Alum. Zavod, Volgograd, USSR

SOURCE: Metallovedenie i Termicheskaya Obrabotka Metallov (1982), (6), 30-3
CODEN: MTOMAX; ISSN: 0026-0819

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The effect of H concn. in controlled furnace atms. contg. 20 and 40% H on mech. properties and the rate of satn. of samples of Armco Fe and case-hardenable (18KhGT [12718-23-9], 30KhGT [37323-42-5], 20Kh3NA [12681-03-7], 20KhGNR [37312-00-8], and 19KhGN [37311-96-9]) and structural (45Kh [60999-09-9] and ShKh15 [12725-40-5]) steels and automobile parts of steel 16KhG [54342-41-5] during carburizing and carbonitriding was studied by reducing the atms. to a common C potential

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IPR2024-01376

and maintaining the latter through the entire expt. The thickness of the layer during carburizing of autoparts in the atms. with 20 and 40% H was 1.4 and 1.6 mm, resp., and in carburizing of steel samples 1.3 and 1.4 mm, resp. The impact toughness, strength, and breaking force during static bending test were higher in the 20% H atm. In carbonitridation, C content in the 20% H atm. was 0.1% higher than that at 40% H, and the rate of part satn. was practically the same. In the atm. with 20% H, heat losses through the furnace brickwork decreased by 25%.

IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization and carbonitridation of case-hardenable, hydrogen in furnace controlled atms. for, mech. properties and satn. rate in relation to)

RN 37312-00-8 CAPLUS

CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-7 (Ferrous Metals and Alloys)

ST steel carburizing atm hydrogen; carbonitridation atm hydrogen steel; Armco iron carbonitridation carburizing hydrogen

IT Controlled atmospheres
(endothermic, for carburization and carbonitridation of Armco iron and steels, hydrogen in, mech. properties and satn. rate in relation to)

IT Controlled atmospheres
(exothermic, for carburization and carbonitridation of Armco iron and steels, hydrogen in, mech. properties and satn. rate in relation to)

IT Carbonitridation and Cyanidation
Carburizing
(gas, of Armco iron and steels, hydrogen-contg. controlled atms. for, mech. properties and satn. rate in relation to)

IT 37311-96-9, reactions 37312-00-8 37323-42-5
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization and carbonitridation of case-hardenable, hydrogen in furnace controlled atms. for, mech. properties and satn. rate in relation to)

IT 1333-74-0, uses and miscellaneous
RL: USES (Uses)
(in carburization and carbonitridation atm. for Armco iron and case-hardenable and structural steels)

L13 ANSWER 86 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN

ACCESSION NUMBER: 1981:195784 CAPLUS Full-text

DOCUMENT NUMBER: 94:195784

ORIGINAL REFERENCE NO.: 94:32003a,32006a

TITLE: Prediction of the effective thickness of a case-hardened layer

AUTHOR(S): Gliner, R. E.; Kharkevich, N. I.

CORPORATE SOURCE: Gor'k. Avto. Zavod, Gorkiy, USSR

SOURCE: Avtomobil'naya Promyshlennost (1981), 46(1), 26-8
CODEN: AVPRA3; ISSN: 0005-2337

DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The carburization of hollow cylinders with wall thickness of 20 mm for steels 20Kh [37329-39-8], 27KhGR [58209-72-6], 20KhN2M [39411-21-7], 30KhMA [12672-15-0], and 18KhGT [12718-23-9] was done 7-14 h at 870-80° in endogas atm. with natural gas addns. The cylinders were then quenched in oil at 140°. Surface carburization was detd. in relation to C distribution in the carburized layer and hardness. Equation was developed for predicting the case depth.
IT 58209-72-6, uses and miscellaneous
RL: USES (Uses)
(case depth of carburized)
RN 58209-72-6 CAPLUS
CN Iron alloy, base, Fe 96-98,Cr 0.70-1.00,Mn 0.70-1.00,Si 0.17-0.37,C 0.25-0.31,Cu 0-0.30,Ni 0-0.30,W 0-0.30,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (27KhGR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	96	-	98	7439-89-6
Cr	0.70	-	1.00	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
C	0.25	-	0.31	7440-44-0
Cu	0	-	0.30	7440-50-8
Ni	0	-	0.30	7440-02-0
W	0	-	0.30	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST steel cylinder carburizing
IT Carburizing
(case depth in, hardness of steel in relation to)
IT 12672-15-0, uses and miscellaneous 12718-23-9, uses and miscellaneous 37329-39-8, uses and miscellaneous 39411-21-7 58209-72-6, uses and miscellaneous 58209-73-7
RL: USES (Uses)
(case depth of carburized)

L13 ANSWER 87 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1980:412105 CAPLUS Full-text
DOCUMENT NUMBER: 93:12105
ORIGINAL REFERENCE NO.: 93:2075a,2078a
TITLE: Interaction of titanium nitride with metallic melts
AUTHOR(S): Gurevich, Yu. G.; Frage, N. R.
CORPORATE SOURCE: Mashinostroit. Inst., Kurgen, USSR
SOURCE: Tezisy Nauchn. Soobshch. Vses. Konf. Str. Svoistvam Met. Shlakovykh Rasplavov, 3rd (1978), Volume 2, 184-6. Akad. Nauk SSSR, Ural. Nauchn. Tsentr: Sverdlovsk, USSR.
CODEN: 43GIAR
DOCUMENT TYPE: Conference
LANGUAGE: Russian
AB The kinetics of TiN dissoln. in Fe-O [12739-25-2], Fe-Ni [11148-11-1], steel ShKh15 [12725-40-5], 25KhGT [12741-98-9], and 20KhGNR [37312-00-8] were studied by using the rotating-specimen method. The TiN oxidn. rate in FeO in the 1st min was greatest and independent of time, in the 2nd min the rate decreased sharply, and after 2 min the TiN dissoln. ceased. TiN was coated with a dense oxide film. No TiN dissoln. occurred in Fe contg. <3% Ni. At >3% Ni TiN dissolved, and the Ti content in the melt increased. The Ti bonds increase in melts with increasing Ni concn. and decreased with stability of TiN in the melts.
IT 37312-00-8
RL: USES (Uses)
(soln. kinetics in molten, of titanium nitride)

RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 97	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 56-7 (Nonferrous Metals and Alloys)
ST titanium nitride soln steel; iron soln titanium nitride; oxygen soln titanium nitride; nickel soln titanium nitride
IT 11148-11-1 12725-40-5 12739-25-2 12741-98-9, uses and miscellaneous
37312-00-8
RL: USES (Uses)
(soln. kinetics in molten, of titanium nitride)
IT 25583-20-4
RL: PRP (Properties)
(soln. kinetics of, in iron and steel melts)

L13 ANSWER 88 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1979:424887 CAPLUS Full-text
DOCUMENT NUMBER: 91:24887
ORIGINAL REFERENCE NO.: 91:4085a,4088a
TITLE: Diffusion saturation of steels with chromium
AUTHOR(S): Babushkin, B. V.; Makharov, D. M.
CORPORATE SOURCE: USSR
SOURCE: Metallurgiya (Minsk) (1978), 12, 92-3
CODEN: MTRGBV; ISSN: 0369-2450
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Chromizing of steels 20KhNR [12742-15-3], 40KhN [12742-05-1], and 20Kh13 [37241-55-7] was carried out by aluminothermic redn. at 1050-1100° in a powder composed of Al2O3 29.40, Cr2O3 51.45, Al 17.15, and NH4Cl 2%. The diffusion layer contained a carbide zone of (Cr,Fe)23C6 and (Cr,Fe)7C3 phases and a solid soln. zone of high-Cr ferrite. The total depth of the diffusion zone decreased and the depth of the carbide zone increased with increasing C content. The max. microhardness (>2000 kg/mm2) was obsd. for Cr carbides on steel 40KhN, and min. (~1350 kg/mm2) for Cr carbides on steel 20Kh13.
IT 12742-15-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(chromizing of, pack)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 98	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.60 - 0.90	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8

C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST chromizing pack steel structure
IT Chromizing
(pack, of steels, carbide morphol. in)
IT 12742-05-1 12742-15-3 37241-55-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(chromizing of, pack)
IT 12012-72-5DP, solid soln. with chromium carbide (Cr23C6) 12075-40-0DP, solid soln. with iron carbide (Fe7C3) 12075-42-2DP, solid soln. with chromium carbide (Cr7C3) 12105-81-6DP, solid soln. with iron carbide (Fe23C6)
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in chromized steel)

L13 ANSWER 89 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1978:567295 CAPLUS Full-text
DOCUMENT NUMBER: 89:167295
ORIGINAL REFERENCE NO.: 89:25893a,25896a
TITLE: Stress corrosion susceptibility of highway bridge construction steels - phase IIB
AUTHOR(S): Caton, R. G.; Guthrie, J. L.; Carter, C. S.
CORPORATE SOURCE: Boeing Commerc. Airplane Co., Seattle, WA, USA
SOURCE: U. S. NTIS, PB Rep. (1976), PB-272493, 73 pp. Avail.: NTIS
From: Gov. Rep. Announce. Index (U. S.) 1977, 77(25), 135
CODEN: XPBRCA; ISSN: 0099-8583
DOCUMENT TYPE: Report
LANGUAGE: English
AB Eleven steels typically used in highway bridge construction were evaluated for stress corrosion resistance in various environments under tension. The effects of welding and 5% cold work were also investigated. Lab. tests were verified by exposure of specimens at selected locations in the United States. Both ASTM A325 [67954-12-5] and ASTM A490 [67954-11-4] bolts were evaluated for stress corrosion resistance in similar environments. The effects of hot dip galvanizing and mech. galvanizing on the stress corrosion susceptibility were also detd. Suspension cable and prestressing wires were evaluated for stress corrosion resistance. The suspension cable wires were tested with no coating, and with hot dip galvanized and electrogalvanized coatings.
IT 52346-86-8, properties
RL: PRP (Properties)
(stress-corrosion susceptibility of, for highway bridge construction)
RN 52346-86-8 CAPLUS
CN Steel, (UNS K11630) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.70	-	1.00	7439-96-5
Cr	0.40	-	0.65	7440-47-3
Si	0.20	-	0.35	7440-21-3
Mo	0.15	-	0.25	7439-98-7
C	0.12	-	0.21	7440-44-0
V	0.03	-	0.08	7440-62-2
S	0	-	0.04	7704-34-9
P	0	-	0.035	7723-14-0
Ti	0.01	-	0.03	7440-32-6
B	0.0005	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)

ST steel bridge construction stress corrosion; structural steel stress corrosion; galvanizing steel stress corrosion; weld steel stress corrosion; cold work steel stress corrosion

IT Galvanized iron and steel
RL: USES (Uses)
(for highway bridge construction)

IT Bridges
(for highways, structural steels for, stress-corrosion susceptibility of)

IT Welds
(in structural steels, in highway bridge construction)

IT Bolts
(structural steel, for highway bridge construction)

IT 12725-37-0, properties 12731-93-0, properties 12732-02-4, properties 12732-05-7, properties 52346-86-8, properties 58397-66-3, properties 63747-69-3, properties 63849-06-9, properties 67954-11-4, properties 67954-12-5, properties
RL: PRP (Properties)
(stress-corrosion susceptibility of, for highway bridge construction)

L13 ANSWER 90 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1978:533594 CAPLUS Full-text
DOCUMENT NUMBER: 89:133594
ORIGINAL REFERENCE NO.: 89:20639a,20642a
TITLE: Effect of atmospheric corrosion on fatigue strength of steels and welded joints
AUTHOR(S): Gregor, Vladimir
CORPORATE SOURCE: Mater. Test. Lab., Weld. Res. Inst., Bratislava, Czech.
SOURCE: Zvaracske Spravy (1976), 26(4), 73-80
CODEN: ZVSPDI; ISSN: 0322-9785
DOCUMENT TYPE: Journal
LANGUAGE: English/Slovak

AB Fatigue strength of base metal and butt-welded joints was detd. in bending and cyclic tension for the low-alloy steel, grades 15217.1 [12742-62-0], 11523.1 [71497-79-5], 16224 [60707-55-3], and 16224 + 0.37% Cu. Effects of corrosion on fatigue strength were detd. for accelerated chamber corrosion (5-150 cycles at 35° in SO2-contg. atm., with humidity and drying), and after 1-yr atm. exposure at a chem. plant. Corrosion rates were similar for all steels. The Cu-modified 16224 steel lost its surface corrosion layer after 30-50 cycles and developed a roughened surface, while the regular 16224 steel did not. Fatigue strength was rapidly decreased by corrosion exposure to ≤40 cycles, remaining nearly const. for longer cycling. Performance of 15217.1 steel was comparable to that of 11523.1 steel.

IT 60707-55-3
RL: PRP (Properties)
(fatigue and weld strength of, after corrosion)

RN 60707-55-3 CAPLUS
CN Iron alloy, base, Fe 95-97,Cr 0.70-1.00,Mn 0.70-1.00,Ni 0.70-1.00,Mo 0.30-0.50,Si 0.12-0.35,Cu 0-0.30,C 0.12-0.18,V 0.03-0.08,Ti 0-0.04,P 0-0.030,S 0-0.030,B 0.002-0.005 (CSN 16 224) (9CI) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Cr	0.70	-	1.00	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Ni	0.70	-	1.00	7440-02-0
Mo	0.30	-	0.50	7439-98-7
Si	0.12	-	0.35	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.12	-	0.18	7440-44-0
V	0.03	-	0.08	7440-62-2
Ti	0	-	0.04	7440-32-6
P	0	-	0.030	7723-14-0
S	0	-	0.030	7704-34-9
B	0.002	-	0.005	7440-42-8

CC 55-9 (Ferrous Metals and Alloys)

ST corrosion fatigue low alloy steel; weld fatigue corrosion steel; cyclic corrosion fatigue steel
IT Welding
(arc, of low-alloy steels, for fatigue and corrosion test)
IT Welds
(butt, in low-alloy steels, fatigue strength in relation to atm. corrosion of)
IT 12742-62-0 60707-55-3 71497-79-5, properties
RL: PRP (Properties)
(fatigue and weld strength of, after corrosion)
IT 7440-50-8, uses and miscellaneous
RL: USES (Uses)
(in low-alloy steels, accelerated chamber corrosion in relation to)
IT 64941-69-1 67661-29-4, uses and miscellaneous 67663-48-3, uses and miscellaneous
RL: USES (Uses)
(welding electrodes, for low-alloy steels)

L13 ANSWER 91 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1978:463151 CAPLUS Full-text
DOCUMENT NUMBER: 89:63151
ORIGINAL REFERENCE NO.: 89:9753a,9756a
TITLE: Determination of the chemical reaction rate constant during the treatment of steel in an endothermic atmosphere
AUTHOR(S): Gyulikhandanov, E. L.; Kislenkov, V. V.
CORPORATE SOURCE: Leningrad, USSR
SOURCE: Izvestiya Akademii Nauk SSSR, Metally (1978), (3), 189-91
CODEN: IZNMAQ; ISSN: 0568-5303
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The high-temp. measurement of elec. resistivity change in steel foil during carburization and decarburization were used to det. the temp. dependence of the reaction const. between endothermic atms. of different compns. and unalloyed γ-Fe. The reaction const. was related to the thermodn. activity of C in alloyed austenite at 925°, i.e., the carburization temp. The value is applicable to any alloy steel and with the diffusion coeff. data is useful in detg. the C distribution through the layer during carburization in the endothermic atm. Foils of Armco Fe and carburizing steels 12KhN3A [12750-62-8], 18Kh2N4VA [12742-21-1], 20KhGNR [37312-00-8], and 20Kh3MVF [37246-14-3] were used in the measurements.
IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in endothermic atm.)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-6 (Ferrous Metals and Alloys)

ST steel carburization endothermic atm
IT Carburizing
(of iron and steel in endothermic atm.)
IT 12742-21-1 12750-62-8 37246-14-3 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in endothermic atm.)

L13 ANSWER 92 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1977:62593 CAPLUS Full-text
DOCUMENT NUMBER: 86:62593
ORIGINAL REFERENCE NO.: 86:9887a,9890a
TITLE: Protection of parts in nonmuffle units from gaseous carbonitridation by chromium plating
AUTHOR(S): Rotin, A. I.; Fishtein, B. M.; Shluger, M. A.
CORPORATE SOURCE: Rostov.-na-Donu Nauchno-Issled. Inst. Tekhnol. Mashinostr., Rostov-on-Don, USSR
SOURCE: Zashchita Metallov (1976), 12(6), 716-18
CODEN: ZAMEA9; ISSN: 0044-1856
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Steel plated with Cr from a bath contg. CrO3 350-400, H2SO4 1.9-2.0, Cr2O3 5-8, NaOH 40-60 g/L, at temp. 18-19° and c.d. 20-100 A/dm2 and after previous anodic surface cleaning at c.d. 25-60 A/dm2 had no diffusion of C or N in it. The depth of the cabronitridated layer in the nonprotected surfaces of the steel was 0.9-1.1 mm after 12.5 h.
IT 59738-82-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation of, chromium electroplate in prevention of)
RN 59738-82-8 CAPLUS
CN Steel, (20KhGNTR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.80	-	1.00	7439-96-5
Cr	0.40	-	0.70	7440-47-3
Ni	0.40	-	0.70	7440-02-0
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.18	-	0.24	7440-44-0
Ti	0.03	-	0.09	7440-32-6
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
B	0.001			7440-42-8

CC 72-6 (Electrochemistry)
ST chromium electroplate steel carbonitridation
IT Carbonitridation and Cyanidation
(of steel, chromium electroplating in prevention of)
IT 12718-23-9, uses and miscellaneous 37329-39-8, uses and miscellaneous 51258-45-8 59738-82-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation of, chromium electroplate in prevention of)
IT 7440-47-3, uses and miscellaneous
RL: PRP (Properties)
(electroplating of, on steel, for carbonitridation prevention)

L13 ANSWER 93 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1977:20628 CAPLUS Full-text
DOCUMENT NUMBER: 86:20628
ORIGINAL REFERENCE NO.: 86:3299a,3302a
TITLE: Hardness of metals during strengthening by surface plastic deformation
AUTHOR(S): Yankov, N. I.; Aleksandrov, B. I.; Yankov, I. I.
CORPORATE SOURCE: Inst. Probl. Nadezhnosti Dolgovechnosti Mash., Minsk, USSR
SOURCE: Vestsi Akademii Navuk BSSR, Seryya Fizika-Tekhnichnykh Navuk (1976), (3), 5-9

CODEN: VABFAF; ISSN: 0002-3566
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The stress-strain relation for Cu, Al, and steels was examd. A method was applied for calcg. the max. hardness of the surface layer during strengthening by surface plastic deformation. For steels, the calcd. results agreed with exptl. data.
IT 59738-82-8, uses and miscellaneous
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(hardening of, by surface plastic deformation)
RN 59738-82-8 CAPLUS
CN Steel, (20KhGNTR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	97 - 98	7439-89-6
Mn	0.80 - 1.00	7439-96-5
Cr	0.40 - 0.70	7440-47-3
Ni	0.40 - 0.70	7440-02-0
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.18 - 0.24	7440-44-0
Ti	0.03 - 0.09	7440-32-6
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
B	0.001	7440-42-8

CC 56-7 (Nonferrous Metals and Alloys)
ST copper surface layer hardness; aluminum surface layer hardness; steel surface layer hardness; surface plastic deformation metal
IT 7429-90-5, properties 7440-50-8, properties 11121-90-7, properties 12611-78-8 12725-40-5 12731-93-0, properties 12732-25-1 12742-05-1 12742-24-4 12742-30-2 12743-82-7, uses and miscellaneous 12750-62-8 37268-90-9, properties 37269-19-5, properties 39294-21-8 59738-82-8, uses and miscellaneous 61431-72-9
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(hardening of, by surface plastic deformation)

L13 ANSWER 94 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1976:546672 CAPLUS Full-text
DOCUMENT NUMBER: 85:146672
ORIGINAL REFERENCE NO.: 85:23487a,23490a
TITLE: Protecting parts from gas carburization and carbonitriding by electroplating with chromium
AUTHOR(S): Rotin, A. I.; Fishtein, B. M.; Shluger, M. A.
CORPORATE SOURCE: Nauchno-Issled. Inst. Tsvetn. Metall., Rostov-on-Don, USSR
SOURCE: Metallovedenie i Termicheskaya Obrabotka Metallov (1976), (5), 49-50
CODEN: MTOMAX; ISSN: 0026-0819
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Cylindrical specimens of 20Kh [37329-39-8], 18KhGT [12718-23-9], 12KhN3A [12750-62-8], and 20KhGNTR [59738-82-8] steels were electroplated with Cr. Then, specimens were carbonitrided at 870° in an atm. contg. CO 18-19, H 42-44, CH4 1-2, NH3 3%, and balance N and oil quenched from 830°. The carbonitrided layer depth was 0.9-1.1 mm on the surface of the uncoated specimens. A 5 μ thick Cr coating inhibited diffusion of C and N. During carbonitriding, a thin interlayer of Cr23C6 and Cr7C3 formed at the Cr-steel interface. This carbide interlayer acted as a barrier to C diffusion.
IT 59738-82-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization and carbonitriding of, chromium electroplating for stopoff in)
RN 59738-82-8 CAPLUS
CN Steel, (20KhGNTR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Component	Component Percent			Component Registry Number
Fe	97	-	98	7439-89-6
Mn	0.80	-	1.00	7439-96-5
Cr	0.40	-	0.70	7440-47-3
Ni	0.40	-	0.70	7440-02-0
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.18	-	0.24	7440-44-0
Ti	0.03	-	0.09	7440-32-6
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
B	0.001			7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST chromium electroplating protection steel carbonitriding
IT Carbonitridation and Cyanidation
Carburization
(of steel, chromium electroplate for stopoff in)
IT 12718-23-9, reactions 12750-62-8 37329-39-8, reactions
59738-82-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization and carbonitriding of, chromium electroplating for stopoff in)
IT 7440-47-3, uses and miscellaneous
RL: USES (Uses)
(electroplating on steel, as stopoff for carburization and carbonitriding prevention)

L13 ANSWER 95 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1976:48042 CAPLUS Full-text
DOCUMENT NUMBER: 84:48042
ORIGINAL REFERENCE NO.: 84:7875a,7878a
TITLE: Diffusion saturation of steel by carbon and manganese
AUTHOR(S): Rishchev, I. A.; Shcherbakov, E. D.; Khudokormova, R. N.; Martynyuk, M. N.
CORPORATE SOURCE: USSR
SOURCE: Khim.-Term. Obrab. Met. Splavov, Tezisy Dokl. Vses. Nauchn. Konf., 2nd (1974), 122-3. Editor(s): Lyakhovich, L. S. Beloruss. Politekh. Inst.: Minsk, USSR.
CODEN: 31GQAQ
DOCUMENT TYPE: Conference
LANGUAGE: Russian
AB The simultaneous cementation of 8 C and low-alloy steels with C and Mn [7439-96-5] in powd. Bondyuzhsk carburizing agent or ferromanganese [12604-53-4] or their mixts. contg. Al2O3 and NH4Cl (ferromanganese-Al2O3-NH4Cl ratio 67:30:3) took place in metal crucibles with consumable covers at 1000° during 4, 6, and 8 hr. The diffusion layers of high-Mn austenite with finely dispersed carbide inclusions formed in mixts. contg. the carburizer 50-80, ferromanganese 15-30, NH4Cl 1-2%, and the rest Al2O3, had wear resistances higher than that of G13 austenitic Mn steel.
IT 12742-15-3
RL: USES (Uses)
(carburization and manganese cementation of, with ferromanganese-contg. compns.)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0

W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST steel cementation carbon manganese; carburization steel ferromanganese; ferromanganese cementation steel
IT Cementation
(of steel with manganese, with ferromanganese-contg. mixts.)
IT Carburization
(of steels, combined with manganese cementation, with ferromanganese-contg. compns.)
IT 12725-33-6, uses and miscellaneous 12731-92-9, uses and miscellaneous 12742-15-3 12742-21-1 12743-82-7, uses and miscellaneous 12750-62-8 37268-90-9, uses and miscellaneous 73286-08-5, reactions
RL: USES (Uses)
(carburization and manganese cementation of, with ferromanganese-contg. compns.)
IT 12604-53-4
RL: USES (Uses)
(cementation of steels with mixts. contg., for simultaneous carburization and manganese cementation)
IT 7439-96-5, uses and miscellaneous
RL: USES (Uses)
(cementation with, combined with carburization, of carbon and low-alloy steels)

L13 ANSWER 96 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1975:483285 CAPLUS Full-text
DOCUMENT NUMBER: 83:83285
ORIGINAL REFERENCE NO.: 83:13051a,13054a
TITLE: Magnetic, electric, and mechanical properties of 20KhGR and 20KhGNR steels and their carburized layers
AUTHOR(S): Kuznetsov, I. A.; Somova, V. M.; Tsar'kova, T. P.; Bashkirov, Yu. P.
CORPORATE SOURCE: USSR
SOURCE: Struktura i svoistva tverdykh tel (1973), (1), 164-84
From: Ref. Zh., Metall. 1974, Abstr. No. 7I547
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Title only translated.
IT 37312-00-8 56995-50-7, properties
RL: USES (Uses)
(elec. and magnetic and mech. properties of carburized)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

RN 56995-50-7 CAPLUS
CN Iron alloy, base, Fe 96-98,Cr 0.75-1.05,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,Ni 0-0.30,C 0.18-0.24,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	96 - 98	7439-89-6
Cr	0.75 - 1.05	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
Ni	0 - 0.30	7440-02-0
C	0.18 - 0.24	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 55-8 (Ferrous Metals and Alloys)
Section cross-reference(s): 76, 77
ST steel carburized property; magnetic property carburized steel; mech property carburized steel; elec property carburized steel
IT Electric property
Magnetic property and Magnetism
(of carburized steel)
IT 37312-00-8 56995-50-7, properties
RL: USES (Uses)
(elec. and magnetic and mech. properties of carburized)

L13 ANSWER 97 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1975:101616 CAPLUS Full-text
DOCUMENT NUMBER: 82:101616
ORIGINAL REFERENCE NO.: 82:16213a,16216a
TITLE: Carburization in an electrothermal fluidized bed
AUTHOR(S): Androshchuk, V. N.; Tsubanov, A. G.; Nikitin, V. S.
CORPORATE SOURCE: USSR
SOURCE: Sbornik Nauchnykh Trudov, Belorusskii Institut Mekhanizatsii Sel'skogo Khozyaistva (1972), 21, 195-7
CODEN: SBMKAP; ISSN: 0370-8640
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Carburization of 10-20 × 20-30 mm 20Kh, 20KhNR, and 18KhGT steel was accomplished in a Kryptol fluidized bed elec. furnace at 900-1000°. The carburization gas contained CO 20, CH4 3.8, H 13.5, CO2 1.2, and O 0.35%. A 1.25-mm carburized layer was obtained in 30 min. at 1000°.
IT 12742-15-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in fluidized bed)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 98	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.60 - 0.90	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7

V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST chromium steel carburization; electrothermal fluidized bed carburizing
IT Carburization
(of steel, in fluidized bed)
IT 12718-23-9, reactions 12742-15-3 37329-39-8, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in fluidized bed)

L13 ANSWER 98 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1974:405409 CAPLUS Full-text
DOCUMENT NUMBER: 81:5409
ORIGINAL REFERENCE NO.: 81:883a,886a
TITLE: Thermophysical properties of steel scale at different temperatures
AUTHOR(S): Severdenko, V. P.; Makushok, E. M.; Ravin, A. N.
CORPORATE SOURCE: Fiz.-Tekh. Inst., Minsk, USSR
SOURCE: Vestsi Akademii Navuk BSSR, Seryya Fizika-Tekhnichnykh Navuk (1974), (1), 33-7
CODEN: VABFAF; ISSN: 0002-3566
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The thermophys. properties (d. sp. heat, heat cond., and heat cond. coeff.) at 20-700° were detd. for the scale component oxides and for the scales on widely used forged and rolled 45, 25KhGT, 20KhNR, 40Kh, ShKh15, and Kh18N10T steels.
IT 12742-15-3
RL: USES (Uses)
(thermophys., of scale coatings on)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B		0.001		7440-42-8

CC 55-8 (Ferrous Metals and Alloys)
ST thermophys property steel scale; oxide scale forged rolled steel; stainless steel scale; alloy low steel scale
IT Heat capacity
Thermal conductivity and conduction
(of scale, on steel)
IT Scale (coating)
(thermophys. properties of, on steel)
IT 1309-37-1, properties 1317-61-9 1345-25-1, properties
RL: PRP (Properties)
(thermophys., in scale on steel)
IT 12611-78-8 12725-40-5 12741-98-9, properties 12742-15-3 37268-90-9, properties 39344-94-0, properties
RL: USES (Uses)

(thermophys., of scale coatings on)

L13 ANSWER 99 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1974:29530 CAPLUS Full-text
DOCUMENT NUMBER: 80:29530
ORIGINAL REFERENCE NO.: 80:4865a,4868a
TITLE: Effect of chemicothermal treatment in hydrogen-containing atmospheres on static crack and brittle strengths of case-hardened steel
AUTHOR(S): Dukarevich, I. S.; Balter, M. A.
CORPORATE SOURCE: USSR
SOURCE: Vestnik Mashinostroeniya (1973), 53(8), 62-5
CODEN: VMASAV; ISSN: 0042-4633
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB Thermochem. treatment is developed in controlled gas atm. contg. H, which is readily adsorbed on the surface. The diffusion coeff. of H is 3-4 orders higher than the diffusion coeffs. of C and N in Fe, and therefore the depth of H-satd. zone is considerably greater than that of the case-hardened or carbonitrided layers. The effects of H satn. on static and brittle strength of steels, after various carburizing treatments in natural gas, carbonitridation in natural gas and ammonia, hardening of carburized steel with heating in endogas with or without addn. of natural gas were studied for the core and the diffusion-coated layer at a relative carburized layer depth 0.25-0.33. A decrease in strength and plasticity during static bending and elongation testing of carburized 20Kh2N4A (Cr-Ni) steel was obsd. The effect of H pickup of steel during treatment in a H-contg. atm., causing a decrease in static and brittle strengths, must be considered in use of diffusion coating. For casehardening and carbonitridation the steel contains ≤0.25% C. Steel with 0.30-0.35% C is extremely sensitive to embrittlement by H. Satn. with H during casehardening and carbonitridation does not decrease the resistance to brittle fracture if the steel is subsequently hardened after heating in air for H desorption, resulting in improved strength and plasticity.

IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, hydrogen effect on plasticity and strength in relation to)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	95 - 97	7439-89-6
Ni	0.80 - 1.10	7440-02-0
Cr	0.70 - 1.10	7440-47-3
Mn	0.70 - 1.00	7439-96-5
Si	0.17 - 0.37	7440-21-3
Cu	0 - 0.30	7440-50-8
C	0.16 - 0.23	7440-44-0
W	0 - 0.20	7440-33-7
Mo	0 - 0.15	7439-98-7
V	0 - 0.05	7440-62-2
P	0 - 0.035	7723-14-0
S	0 - 0.035	7704-34-9
Ti	0 - 0.03	7440-32-6
B	0.001	7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST carburization steel mech property; carbonitridation steel mech property; cementation steel hydrogen embrittlement
IT Natural gas
RL: USES (Uses)
(carbonitridation in, of steels, plasticity and strength in relation to)
IT Diffusion
(of hydrogen in casehardening of steels, plasticity and

strength in relation to)
IT Carbonitridation and Cyanidation
Carburization
(of steels, hydrogen effect on plasticity and strength in relation to)
IT 1333-74-0, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation in gases contg., of steels, plasticity and strength in relation to)
IT 7664-41-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbonitridation in, of steels, plasticity and strength in relation to)
IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, hydrogen effect on plasticity and strength in relation to)

L13 ANSWER 100 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1973:482245 CAPLUS Full-text
DOCUMENT NUMBER: 79:82245
ORIGINAL REFERENCE NO.: 79:13333a,13336a
TITLE: Improvement of gas carburization
AUTHOR(S): Beloruchev, L. V.; Korolev, V. A.; Cherepkova, K. F.
CORPORATE SOURCE: USSR
SOURCE: Nadezhnost Dolgovechnost Metal. Mater. Mashinostr. Priborostr. (1972) 99-102
From: Ref. Zh., Met. 1973, Abstr. No. 1I786
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Progress in gas carburization by using endothermically controlled atms. as carrier gas in the USSR and abroad was studied. The feasibility of carburization in N with addn. of natural gas was tested. Steel 20KhGNR (Cr-Mn-Ni-B) was heated in an exptl. furnace at 940° for 10 hr in a mixt. of N with 6% H and 5% natural gas. A 1-8 mm carburized layer was obtained and internal oxidn. was absent. The carburizing capacity of a N-natural gas mixt. was high as was the diffusion rate of C in this mixt.
IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in natural gas contg. nitrogen)
RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST gas carburization alloy steel; natural gas carburization steel; chromium manganese steel carburization; nickel chromium steel carburization; boron contg steel carburization
IT Natural gas
RL: USES (Uses)
(carburization of steel in nitrogen-contg.)
IT Carburization

(of steel, in natural gas contg. nitrogen)
IT 7727-37-9, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of steel in natural gas contg.)
IT 37312-00-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(carburization of, in natural gas contg. nitrogen)

L13 ANSWER 101 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1973:162649 CAPLUS Full-text
DOCUMENT NUMBER: 78:162649
ORIGINAL REFERENCE NO.: 78:26093a,26096a
TITLE: Strength characteristics of scale
AUTHOR(S): Severdenko, V. P.; Makushok, E. M.; Ravin, A. N.
CORPORATE SOURCE: Minsk, USSR
SOURCE: Izvestiya Akademii Nauk SSSR, Metally (1973), (1), 123-7
CODEN: IZNMAQ; ISSN: 0568-5303
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB A method for detg. the yield strength, σ, of scales on St. 45, ShKh15, Kh18N10T, 20KhNR, and 25KhGT steels is discussed, and σ values for these scales at various temps. (t = 600-1150°) and degrees of deformation (0.50-0.80) are tabulated. At high temp. and similar deformation conditions, the strengths of scales are lower than those of steels, i.e. scale decreases the friction coeff. of steels and can act as a lubricant during forming of steel. In absence of phase transformation in scales, their σ-t relations are exponential.
IT 12742-15-3, properties
RL: USES (Uses)
(yield strength of scale on)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-11 (Ferrous Metals and Alloys)
ST yield strength mill scale; friction steel scale strength
IT Scale (coating)
(mill, yield strength of)
IT 12725-40-5 12741-98-9, properties 12742-15-3, properties 37268-90-9, properties 54611-20-0
RL: USES (Uses)
(yield strength of scale on)

L13 ANSWER 102 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1972:529437 CAPLUS Full-text
DOCUMENT NUMBER: 77:129437
ORIGINAL REFERENCE NO.: 77:21303a,21306a
TITLE: Use of protective glass coatings during the heat treatment of steel components
AUTHOR(S): Emel'yanenko, N. L.; Shagabutdinov, R. I.; Valeev, R.

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

M.; Smirnova, L. P.
CORPORATE SOURCE: Chelyab. Trakt. Zavod, Chelyabinsk, USSR
SOURCE: Metallovedenie i Termicheskaya Obrabotka Metallov (1972), (7), 74-5
CODEN: MTOMAX; ISSN: 0026-0819
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB The protective capacities of various coatings deposited on the surfaces of R12 and R18 (Cr-W-V), St. 45, R6M3 and R9K5 (Cr-Co-W-V), R9M4 (Cr-W-V), 20Kh (Cr), and 20KhGNR (Cr-Mn-Ni-B) steels during heating at 1250-1400° were examd. All the steels were preheated at 860° for 30 min, annealed at 1240-70° for 15-20 min, and oil quenched. Preliminary results showed that the best protective properties were achieved by using an enamel of the EZh-01 type contg. ~25% Al2O3. The same enamel was used to protect the steels 20KhGNR and 18Kh2N4VA (Cr-Ni-W) from decarburization during their thermal treatment (annealing at 870° for 2 hr and quenching from 880°, then tempering at 220° for 4 hr). In the presence of EZh-01, decarburization is completely suppressed, whereas in its absence the depth of the decarburized zone may reach 0.1 mm. After the thermal treatment, the coating can be easily removed by shot blasting or by dissolving in molten KOH or NaOH at 500-50°.

IT 37312-00-8
RL: USES (Uses)
(heat treatment of, protective glass coatings for)

RN 37312-00-8 CAPLUS
CN Iron alloy, base, Fe 95-97,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.70-1.00,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhGNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	97	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.70	-	1.00	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55-6 (Ferrous Metals and Alloys)
ST coating steel heat treatment; enamel coating steel; decarburization prevention steel enameling

IT Coating removers
(alkali metal hydroxide, for protective glass dissoln. on steel after heat treatment)

IT Enamels
(aluminum oxide-contg., on steel for decarburization prevention during heat treatment)

IT Glass
RL: USES (Uses)
(coatings, on steel for decarburization prevention during heat treatment)

IT Coating materials
(glass, on steel for decarburization prevention during heat treatment)

IT 1310-58-3, uses and miscellaneous 1310-73-2, uses and miscellaneous
RL: USES (Uses)
(glass coating removal by molten, from heat-treated steel)

IT 12715-04-7, uses and miscellaneous 12743-13-4 37241-62-6 37302-40-2 37302-41-3 37302-42-4, uses and miscellaneous 37312-00-8 37329-39-8, uses and miscellaneous
RL: USES (Uses)

(heat treatment of, protective glass coatings for)

L13 ANSWER 103 OF 103 CAPLUS COPYRIGHT 2021 ACS on STN
ACCESSION NUMBER: 1972:116614 CAPLUS Full-text
DOCUMENT NUMBER: 76:116614
ORIGINAL REFERENCE NO.: 76:18841a,18844a
TITLE: Mechanical properties of nitrocemented steels at static loads
AUTHOR(S): Rozenberg, S. E.
CORPORATE SOURCE: USSR
SOURCE: Khim.-Term. Obrab. Metal. Splavov (1971) 98-101
From: Ref. Zh., Met. 1971, Abstr. No. 10I398
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The effects of the carbonitrided layer depth (0.55, 0.8, and 1.1), chem. compn., and microstructure on the notch toughness and tensile strength (during bending and torsion) were detd. for the 20KhNR, 25KhGM, and 25KhGT steels. The carbonitrided 20KhNR steel had better mech. properties than the 25KhGM and 25KhGT steels. An increase in the carbonitrided layer depth from 0.55 to 1.1 mm results in a decrease of tensile strength during bending, notch toughness, and torsion angle, but increased the torsional strength. The content of N in the carbonitrided layer should be ≤0.3%. Cold treatment decreased all of the mech. properties. The carbonitrided 25KhGM steel has a strength similar to that of the 20KhNR steel. The 25KhGT steel has the lowest strength but the plasticity of its carbonitrided layer is higher than that on the 25KhGM steel.
IT 12742-15-3, properties
RL: PRP (Properties)
(mech., carbonitridation effect on)
RN 12742-15-3 CAPLUS
CN Iron alloy, base, Fe 95-98,Ni 0.80-1.10,Cr 0.70-1.10,Mn 0.60-0.90,Si 0.17-0.37,Cu 0-0.30,C 0.16-0.23,W 0-0.20,Mo 0-0.15,V 0-0.05,P 0-0.035,S 0-0.035,Ti 0-0.03,B 0.001 (20KhNR) (CA INDEX NAME)

Component	Component Percent			Component Registry Number
Fe	95	-	98	7439-89-6
Ni	0.80	-	1.10	7440-02-0
Cr	0.70	-	1.10	7440-47-3
Mn	0.60	-	0.90	7439-96-5
Si	0.17	-	0.37	7440-21-3
Cu	0	-	0.30	7440-50-8
C	0.16	-	0.23	7440-44-0
W	0	-	0.20	7440-33-7
Mo	0	-	0.15	7439-98-7
V	0	-	0.05	7440-62-2
P	0	-	0.035	7723-14-0
S	0	-	0.035	7704-34-9
Ti	0	-	0.03	7440-32-6
B	0.001			7440-42-8

CC 55 (Ferrous Metals and Alloys)
ST carbonitrided steel property
IT Carbonitridation and Cyanidation
(of steel, mech. properties in relation to)
IT 12597-69-2, properties 12741-98-9, properties 12742-15-3, properties
RL: PRP (Properties)
(mech., carbonitridation effect on)

=>

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23280 7590 02/09/2021

Davidson, Davidson & Kappel, LLC
589 8th Avenue
22nd Floor
New York, NY 10018

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Simon Steiner	(Typed or printed name)
/Simon Steiner/	(Signature)
February 9, 2021	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/413,799	05/16/2019	Pascal DRILLET	20631.1028CON5	7637

TITLE OF INVENTION: Coated Steel Strips, Coated Stamped Products and Methods

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	05/10/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
SCHLEIS, DANIEL J	1784	428-653000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Davidson, Davidson & Kappel, LLC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: ArcelorMittal

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Luxembourg, Luxembourg

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

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5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /williamcgehris/ Date February 9, 2021

Typed or printed name William C. Gehris Registration No. 38156

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1412 of 1430

Electronic Patent Application Fee Transmittal

Application Number:	16413799
Filing Date:	16-May-2019
Title of Invention:	Coated Steel Strips, Coated Stamped Products and Methods
First Named Inventor/Applicant Name:	Pascal DRILLET
Filer:	William C. Gehris/Simon Steiner
Attorney Docket Number:	20631.1028CON5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

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IPR2024-01376

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1200**

Electronic Acknowledgement Receipt

EFS ID:	41878012
Application Number:	16413799
International Application Number:	
Confirmation Number:	7637
Title of Invention:	Coated Steel Strips, Coated Stamped Products and Methods
First Named Inventor/Applicant Name:	Pascal DRILLET
Customer Number:	23280
Filer:	William C. Gehris/Simon Steiner
Filer Authorized By:	William C. Gehris
Attorney Docket Number:	20631.1028CON5
Receipt Date:	09-FEB-2021
Filing Date:	16-MAY-2019
Time Stamp:	14:55:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1200
RAM confirmation Number	E202129E55560588
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Authorized User	Simon Steiner

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37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

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IPR2024-01376

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	IF.PDF	141026 c2a03d638a9e47237fc317afc897868a2f1dbca0	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30545 96c30217e94cedede5504277a2a52555eeaff743	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	171571		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16413799
Filing Date	2019-05-16
First Named Inventor	Pascal DRILLET
Art Unit	
Examiner Name	SCHLEIS, DANIEL J
Attorney Docket Number	20631.1028CON5

U.S.PATENTS

Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
Change(s) applied to document. /P.H./ 2/18/2021	1	5116645	A	1992-05-26	Boston et al. ~~ARMCO STEEL CO LP~~	
	2	4257549	A	1981-03-24	Bricmont ~~ROBERTSON CO HH~~	
	3	5495736	A	1996-03-05	Nishi et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020114884	A1	2002-08-22	FRIEDERSDORF FRITZ J et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	19749706	DE	C1	1999-03-04	MANNESMANN AG	See English Abstract and EPO machine translation	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DJS/

PART B - FEE(S) TRANSMITTAL

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By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23280 7590 02/09/2021
Davidson, Davidson & Kappel, LLC
589 8th Avenue
22nd Floor
New York, NY 10018

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Simon Steiner	(Typed or printed name)
/Simon Steiner/	(Signature)
February 9, 2021	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/413,799	05/16/2019	Pascal DRILLET	20631.1028CON5	7637

TITLE OF INVENTION: Coated Steel Strips, Coated Stamped Products and Methods

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	05/10/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
SCHLEIS, DANIEL J	1784	428-653000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Davidson, Davidson & Kappel, LLC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: ArcelorMittal

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Luxembourg, Luxembourg

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ☒ Corporation or other private group entity ❑ Government

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 500552

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /williamcgehris/ Date February 9, 2021

Typed or printed name William C. Gehris Registration No. 38156

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1418 of 1430

Electronic Acknowledgement Receipt

EFS ID:	42017791
Application Number:	16413799
International Application Number:	
Confirmation Number:	7637
Title of Invention:	Coated Steel Strips, Coated Stamped Products and Methods
First Named Inventor/Applicant Name:	Pascal DRILLET
Customer Number:	23280
Filer:	William C. Gehris/Simon Steiner
Filer Authorized By:	William C. Gehris
Attorney Docket Number:	20631.1028CON5
Receipt Date:	25-FEB-2021
Filing Date:	16-MAY-2019
Time Stamp:	09:19:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	IssueFees.PDF	141611 f8c22c57b9bd7a6e9aaae2d5d836226444eb7991	no	1

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IPR2024-01376

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Total Files Size (in bytes):	141611

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/413,799	03/30/2021	10961602	20631.1028CON5	7637

23280 7590 03/10/2021

Davidson, Davidson & Kappel, LLC
589 8th Avenue
22nd Floor
New York, NY 10018

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Pascal DRILLET, Rozerieulles, FRANCE;
ArcelorMittal, Luxembourg, LUXEMBOURG;
Dominique Spehner, Balan, FRANCE;
Ronald Kefferstein, Saint Mitre Les Ramparts, FRANCE;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1421 of 1430

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Application of:	ARCELORMITTAL
Inventor(s):	Drillet et al.
Application No.:	16/413,799
Filed:	May 16, 2019
Patent No. :	10,961,602 B2
Issued:	March 30, 2021
Attorney Docket No.:	20631.1028CON5
Confirmation No.:	7637
Examiner:	Daniel J. Schleis
Title:	Coated Steel Strips, Coated Stamped Products and Methods

Submitted electronically via EFS-WEB April 19, 2021

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 C.F.R. § 1.323

Sir:

Pursuant to 35 U.S.C. § 255 and 37 C.F.R. § 1.323, Applicant hereby requests that the U.S. Patent and Trademark Office issue a Certificate of Correction for the above-identified patent to correct mistakes of a clerical nature, typographical nature.

The following corrections are requested:

1) In column 7, line 8, -- . -- should be inserted between "ABCD" and "For sheets";
2) In column 7, line 27, -- (e.g., -- should be inserted before "7.7";
3) In column 12, line 19, -- . -- should be inserted between "coating" and "On series A"; and
4) In column 13, line 12, -- . -- should be inserted between "surface" and "Resis-".

Applicant submits that these corrections do not require changes which would constitute new matter or require reexamination.

The appropriate fees under 37 C.F.R. 1.20(a) in the amount of $ 160.00 are submitted herewith. In the event that fees are due, the Commissioner is hereby authorized to charge the fee required for this correction to Deposit Account No. 50-0552.

Respectfully submitted,
DAVIDSON, DAVIDSON & KAPPEL, LLC

By: /Oleg Ioselevich/

(Oleg Ioselevich, Reg. No. 56,963)

Davidson, Davidson & Kappel, LLC
589 Eighth Ave, 22nd Floor
New York, New York 10018

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376
Page 1423 of 1430

PTO/SB/44 (09-07)
Approved for use through 03/31/2023. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,961,602

APPLICATION NO.: 16/413,799

ISSUE DATE : Mar. 30, 2021

INVENTOR(S) : Pascal Drillet et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 7, line 8, -- . -- should be inserted between “ABCD” and “For sheets”
In column 7, line 27, -- (e.g., -- should be inserted before “7.7”
In column 12, line 19, -- . -- should be inserted between “coating” and “On series A”
In column 13, line 12, -- . -- should be inserted between “surface” and “Resis-”

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

Davidson, Davidson & Kappel, LLC
589 Eighth Ave, 22nd Floor
New York, New York 10018

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	16413799
Filing Date:	16-May-2019
Title of Invention:	Coated Steel Strips, Coated Stamped Products and Methods
First Named Inventor/Applicant Name:	Pascal DRILLET
Filer:	Oleg Ioselevich
Attorney Docket Number:	20631.1028CON5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
CERTIFICATE OF CORRECTION	1811	1	160	160

ArcelorMittal Ex. 2001
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IPR2024-01376

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Electronic Acknowledgement Receipt

EFS ID:	42487161
Application Number:	16413799
International Application Number:	
Confirmation Number:	7637
Title of Invention:	Coated Steel Strips, Coated Stamped Products and Methods
First Named Inventor/Applicant Name:	Pascal DRILLET
Customer Number:	23280
Filer:	Oleg Ioselevich
Filer Authorized By:	
Attorney Docket Number:	20631.1028CON5
Receipt Date:	19-APR-2021
Filing Date:	16-MAY-2019
Time Stamp:	13:57:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$160
RAM confirmation Number	E20214IE00144345
Deposit Account	500552
Authorized User	Oleg Ioselevich

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

ArcelorMittal Ex. 2001
Posco Co. LTD. v. ArcelorMittal
IPR2024-01376

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	206311028con5ReqCerCor_19 April21.pdf	501958 b18e05364e397d816e1a3750878a2530c9a afe64	no	2
Warnings:					
Information:					
2	Request for Certificate of Correction	sb0044_19April2021.pdf	228629 a40453527dc4118408b141873fb57ba99a0 d1acf	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30308 cbe6bf49f357b36c47fb6e6c84fb6f851b898 a41	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	760895		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 10,961,602 B2
APPLICATION NO. : 16/413799
DATED : March 30, 2021
INVENTOR(S) : Pascal Drillet et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

In Column 7, Line 8, -- . -- should be inserted between "ABCD" and "For sheets"
In Column 7, Line 27, -- (e.g., -- should be inserted before "7.7"
In Column 12, Line 19, -- . -- should be inserted between "coating" and "On series A"
In Column 13, Line 12, -- . -- should be inserted between "surface" and "Resis-"

Signed and Sealed this
Eighteenth Day of May, 2021

Drew Hirshfeld
Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office