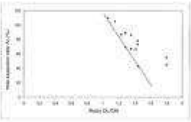


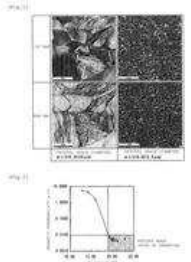
#			Title	Publication number	1st app. date	Applicant/Assignee	1st publ. date	Publ. date
1.			Steel sheet having very high mechanical properties of strength and ductility, manufacturing method and use of such sheets	CA2916634	2013-07-24	AIR CONDITIONING INVESTIGACI ZYZADAR SLI ARCELORMITTAL* ARCELORMITTAL INVESTIGACION &	2015-01-29	2015-01-29

$T_{\text{cooling}} < 1.619 (T_{\text{fix}} - T_1) \text{ at } T_1 = 206 \text{ C} - 43 \text{ Mn} - 164 \text{ Cr} - 890 \text{ Nb}$
 $T_{\text{cooling}} < 1.619 (T_{\text{fix}} - T_2) \text{ at } T_2 = 50 \text{ C} + 4 \text{ Mn} - 14 \text{ Cr} + 1364 \text{ Nb} - 132$
 $T_{\text{cooling}} < 1.619 (T_{\text{fix}} + T_3) \text{ at } T_3 = 206 \text{ C} - 43 \text{ Mn} - 164 \text{ Cr} - 890 \text{ Nb}$
 $T_{\text{cooling}} < 1.619 (T_{\text{fix}} - T_2) \text{ at } T_2 = 50 \text{ C} + 4 \text{ Mn} - 14 \text{ Cr} + 1364 \text{ Nb} - 132$
 $T_{\text{cooling}} < 1.619 (T_{\text{fix}} - T_1) \text{ at } T_1 = 206 \text{ C} - 43 \text{ Mn} - 164 \text{ Cr} - 890 \text{ Nb}$
 $T_{\text{cooling}} < 1.619 (T_{\text{fix}} - T_2) \text{ at } T_2 = 50 \text{ C} + 4 \text{ Mn} - 14 \text{ Cr} + 1364 \text{ Nb} - 132$

The invention relates mainly to a hot-rolled steel sheet having: a yield strength greater than 690 MPa and less than or equal to 840 MPa, strength of between 780 MPa and 950 MPa, elongation at break greater than 10 % and a hole expansion ratio (Ac) greater than or equal to 50%. The chemical composition of the sheet of the invention comprises the following, expressed by weight, namely: 0.040 % = C = 0.065 %, 1.4 % = Mn = 1.9 %, 0.1% = Si = 0.55 %, 0.095 % = Ti = 0.145 %, 0.025 % = Nb = 0.045 %, 0.005 % = Al = 0.1 %, 0.002% = N = 0.007 %, S = 0.004 %, P<0.020. Moreover, the microstructure thereof is formed by: granular bainite, ferrite, less than 1.5 % cementite by area percentage, and carbonitrides of titanium and niobium, providing a hole expansion ratio (Ac) greater than or equal to 50%. The ratio between the grain size DL measured parallel to the rolling direction and the grain size DN measured perpendicularly to the rolling direction is less than or equal to 1.4. The invention also relates to methods for producing one such sheet, in which the composition can optionally include chromium.



[Problem] To provide a raw material steel sheet for providing a high strength nonmagnetic austenitic stainless steel material that has a high elastic limit stress and excellent toughness. [Solution to Problem] An austenitic stainless steel sheet containing 0.12% or less of C, from 0.30 to 3.00% of Si, from 2.0 to 9.0% of Mn, from 7.0 to 15.0% of Ni, from 11.0 to 20.0% of Cr, and 0.30% or less of N, and further containing at least one kind of 3.0% or less of Mo, 1.0% or less of V, 1.0% or less of Nb, 1.0% or less of Ti, and 0.010% or less of B, all in terms of percentage by mass, with the balance of Fe and unavoidable impurities, having a component composition having a Ni equivalent of 19.0 or more, having a value of $d - 1/2$ of 0.40 or more, wherein d (μm) represents an average austenitic crystal grain diameter, and having a property that provides a magnetic permeability μ of 1.0100 or less after subjected to cold rolling with an equivalent strain of 0.50 or more.



Provided is a steel sheet for crown cap that, even when reduced in gauge, has sufficient strength and formability suitable for forming crown caps, and a method for producing the steel sheet for crown cap. The steel sheet for crown cap has a composition including, in terms of % by mass, C: 0.002% or more and 0.010% or less, Si: 0.05% or less, Mn: 0.05% or more and 0.30% or less, P: 0.030% or less, S: 0.020% or less, Al: less than 0.0100%, N: 0.0050% or less, and the balance being Fe and unavoidable impurities. The C content is more than 0.003% when the Al content is 0.005% or more. The yield strength in the rolling direction is 500 MPa or more. The average Lankford value described below is 1.3 or more.

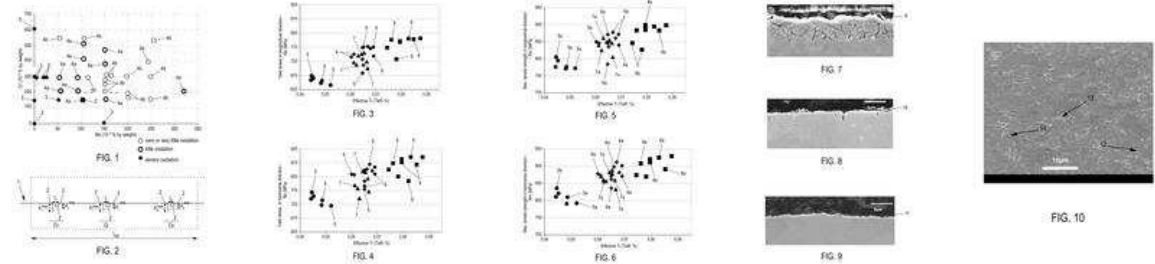
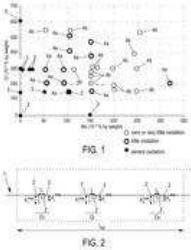
$$\Delta r = (r_L - 2 \times r_D + r_C)/2, \quad \text{Average Lankford value} = (r_L + 2 \times r_D + r_C)/4, \quad \Delta r = (r_L - 2 \times r_D + r_C)/2,$$

Provided are: a steel sheet for a crown cap that has adequate strength and moldability even when used after being made thin; a manufacturing method therefor; and a crown cap. The steel sheet has a composition containing, in mass%, C: 0.010% to 0.025%, Si: not more than 0.10%, Mn: 0.05% to 0.50%, P: not more than 0.050%, S: 0.005% to 0.050%, Al: 0.020% to 0.070%, and N: less than 0.0040%, the balance being obtained from Fe and unavoidable impurities. Regarding yield strength after heat treatment for fifteen minutes at 210°C, yield strength in the rolling direction is at least 550 MPa and yield strength in the rolling plane in a direction that is 45° from the rolling direction is not more than the mean of the yield strength in the rolling direction and the yield strength in the rolling plane in a direction that is 90° from the rolling direction.

項目	単位	値	項目	単位	値
炭素 (C)	質量%	0.010~0.025	マンガン (Mn)	質量%	0.05~0.50
シリコン (Si)	質量%	0.10以下	リン (P)	質量%	0.050以下
硫黄 (S)	質量%	0.005~0.050	アルミニウム (Al)	質量%	0.020~0.070
窒素 (N)	質量%	0.0040以下			

項目	単位	値	項目	単位	値
鉄 (Fe)	質量%	残量	銅 (Cu)	質量%	0.005以下
ニッケル (Ni)	質量%	0.005以下	コバルト (Co)	質量%	0.005以下
モリブデン (Mo)	質量%	0.005以下	チタン (Ti)	質量%	0.005以下
バナジウム (V)	質量%	0.005以下	ニオブ (Nb)	質量%	0.005以下

The invention relates mainly to a sheet of hot-rolled steel with an elastic limit of more than 680 MPa at least in the direction across the rolling direction, and no higher than 840 MPa, with strength of 780 MPa and 950 MPa, elongation at break higher than 10% and hole expansion ratio (Ac) no lower than 45%, in which the chemical composition consists of, the contents being expressed as weight percentages: 0.04% ≤ C ≤ 0.08%, 1.2% ≤ Mn ≤ 1.9%, 0.1 % ≤ Si ≤ 0.3%, 0.07% ≤ Ti ≤ 0.125%, 0.05% ≤ Mo ≤ 0.35%, 0.15% ≤ Cr ≤ 0.6% when 0.05% ≤ Mo ≤ 0.11% or 0.10% ≤ Cr ≤ 0.6% when 0.11 % ≤ Mo ≤ 0.35%, Nb ≤ 0.045%, 0.005% ≤ Al ≤ 0.1 %, 0.002% ≤ N ≤ 0.01 %, S ≤ 0.004%, P ≤ 0.020%, and optionally 0.001% ≤ V ≤ 0.2%, the remainder consisting of iron and inevitable impurities from the production process, in which the microstructure consists of granular bainite having a surface percentage higher than 70%, and ferrite having a surface percentage lower than 20%, the possible complement consisting of lower bainite, martensite and residual austenite, the sum of the contents of martensite and residual austenite being lower than 5%. The invention also relates to the method for manufacturing such a sheet.

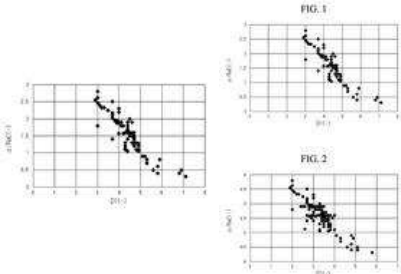
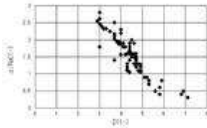


A steel sheet has a microstructure that contains ferrite in an area ratio of 20 % or more, martensite in an area ratio of 5 % or more, and tempered martensite in an area ratio of 5 % or more. The ferrite has a mean grain size of 20.0 μm or less. An inverse intensity ratio of 3-fiber to ±-fiber in the ferrite is 1.00 or more and an inverse intensity ratio of 3-fiber to ±-fiber in the martensite and the tempered martensite is 1.00 or more.

$$C^* = (C - (12.8 / 45.9) \times (Ti + (47.8 / 14.8) \times N + (47.8 / 32.3) \times S)) / ((12.8 / 55.9) \times V) \times 10000 \quad (1)$$

$$C^* = (C - (12.8 / 45.9) \times (Ti + (47.8 / 14.8) \times N + (47.8 / 32.3) \times S)) / ((12.8 / 55.9) \times V) \times 10000 \quad (1)$$

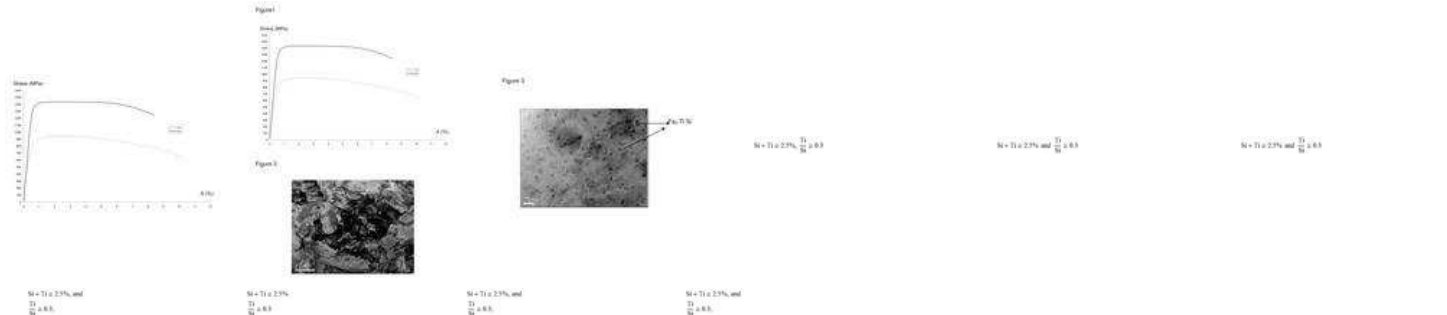
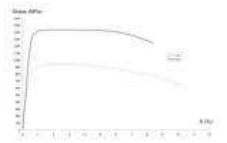
A hot-rolled steel sheet satisfies that average pole density of orientation group of {100}<011> to {223}<110> is 1.0 to 5.0 and pole density of crystal orientation {332}<113> is 1.0 to 4.0. Moreover, the hot-rolled steel sheet includes, as a metallographic structure, by area%, ferrite and bainite of 30% to 99% in total and martensite of 1% to 70%. Moreover, the hot-rolled steel sheet satisfies following Expressions 1 and 2 when area fraction of the martensite is defined as fm in unit of area%, average size of the martensite is defined as dia in unit of μm, average distance between the martensite is defined as dis in unit of μm, and tensile strength of the steel sheet is defined as TS in unit of MPa. dia %≧ 13 % TS / fm × dis / dia %≧ 500



12.	High-strength hot dip galvanized steel plate having excellent moldability, weak material anisotropy and ultimate tensile strength of 980 mpa or more, high-strength alloyed hot dip galvanized steel plate and manufacturing method there...	CA2850091	2012-09-28	NIPPON STEEL & SUMITOMO METAL* NIPPON STEEL & SUMITOMO MIYAMOTO MAITLAND CAPITAL NIPPON STEEL & SUMITOMO METAL	2013-04-04	2013-04-04
[Abstract] Provided is a high-strength hot-dip galvanized steel sheet having small material anisotropy and excellent formability with an ultimate tensile strength of 980 MPa or more. The hot-dip galvanized steel sheet includes a hot-dip galvanized layer formed on a surface of a base steel plate. The base steel plate contains, by mass%, C: 0.1 to less than 0.40%, Si: 0.5 to 3.0%, Mn: 1.5 to 3.0%, O: limited to 0.006% or less, P: limited to 0.04% or less, S: limited to 0.01% or less, Al: limited to 2.0% or less, N: limited to 0.01% or less, and a balance including Fe and inevitable impurities. A microstructure of the base steel sheet contains ferrite of 40% or more, residual austenite of 8 to less than 60%, by volume fraction, and a balance being bainite or martensite. In a sheet thickness range of 5/8 to 3/8 from the surface of the base steel sheet, a pole density of specific crystal orientation is within a predetermined range. The hot-dip galvanized layer contains Fe: less than 7 mass% and a balance including Zn, Al, and inevitable impurities.						
13.	Alloyed hot-dip galvanized steel sheet	CA2849286	2012-09-28	NIPPON STEEL & SUMITOMO METAL* NIPPON STEEL & SUMITOMO MIYAMOTO MAITLAND CAPITAL	2013-04-04	2013-04-04
A high-strength alloyed hot-dip galvanized steel sheet obtained by subjecting the surface of a high-strength steel sheet to alloyed hot-dip galvanization, and formed from a steel sheet containing, in mass%, main components, and containing at least 40 vol% bainite and/or martensite, 8-60 vol% retained austenite, and less than 40 vol% ferrite, with the remainder comprising unavoidable structures. In the alloyed hot-dip galvanized steel sheet, the total thickness of the Gamma1 layer and the Gamma layer (Tgamma1+Tgamma) is 2 [μm] or less in the alloy layers formed by hot-dip galvanization, and the Gamma1 phase/Gamma phase thickness ratio (Tgamma1/Tgamma) is 1 or less. A tensile strength of 980 MPa or above can be easily imparted to the alloyed hot-dip galvanized steel sheet. The alloyed hot-dip galvanized steel sheet has excellent coating adherence, and coating separation during machining can be suppressed.						
14.	High-strength hot-dip zinc-coated steel sheet having excellent workability, weldability and fatigue properties, and process for production thereof	WO2010126161	2009-04-28	JFE STEEL*	2010-11-04	2010-11-04
A high strength galvanized steel sheet having excellent formability, weldability, and fatigue properties and a tensile strength equal to or higher than 980 MPa and a method for manufacturing the same. The steel sheet contains all in mass%, C: 0.05% to <0.12%, Si: 0.35% to <0.80%, Mn: 2.0 to 3.5%, P: 0.001 to 0.040%, S: 0.0001 to 0.0050%, Al: 0.005 to 0.1%, N: 0.0001 to 0.0060%, Cr: 0.01% to 0.5%, Ti: 0.010 to 0.080%, Nb: 0.010 to 0.080%, and B: 0.0001 to 0.0030%, optionally one or more of Mo: 0.01 to 0.15%, Ca: 0.0001 to 0.0050%, REM: 0.0001 to 0.1%, and Sb: 0.0001 to 0.1%, and Fe and unavoidable impurities as the balance, has a microstructure containing a ferrite phase with a volume fraction in a range of 20 to 70% and an average grain diameter equal to or smaller than 5 μm, and has a galvanized layer on a surface thereof at a coating weight (per side) of 20 to 150 g/m².						
15.	Cold-rolled steel sheet and production method thereof	CA2831404	2012-03-28	NIPPON STEEL NIPPON STEEL & SUMITOMO METAL*	2012-10-04	2012-10-04
This is a cold-rolled steel sheet includes, by mass%, C: 0.02% to 0.4%, Si: 0.001% to 2.5%, Mn: 0.001% to 4.0%, and Al: 0.001% to 2.0%. The sum of the Si content and the Al content is 1.0% to 4.5%. An average pole density of an orientation group from {100}<011> to {223}<110> is 1.0 to 6.5, and a pole density of a crystal orientation {332}<113> is 1.0 to 5.0. A microstructure includes, by an area ratio%, 5% to 80% of ferrite, 5% to 80% of bainite, and 2% to 30% of retained austenite. In the microstructure, by an area ratio%, martensite is limited to 20% or less, pearlite is limited to 10% or less, and tempered martensite is limited to 60% or less.						

16.	Rolled steel that hardens by means of precipitation after hot-forming and/or quenching with a tool having very high strength and ductility, and method for manufacturing same	CA2847809	2011-09-06	AIRCEL S MITTAL INVESTOR LOGISTICS CITY EN DE CESAR & WAITING APOLLO ADSL ARCELOMITTAL INVESTIGACION & DESARROLLO* ARCELORUMITAR A. INVESTIGATIONSION A. I A. DESAROJO A. ESE A. ELE ARCELOMITTAL INVESTIGASON I DESSARROLLO	2013-03-14	2013-03-14
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The invention relates to a rolled-steel sheet or blank, the composition of which includes, the contents being expressed in wt %: C ≤ 0.1%, 0.5% ≤ Mn ≤ 7%, 0.5% ≤ Si ≤ 3.5%, 0.5% < Ti ≤ 2%, 2% < Ni ≤ 7%, Al ≤ 0.10%, Cr ≤ 2%, Cu ≤ 2%, Co ≤ 2%, Mo ≤ 2%, S ≤ 0.005%, P ≤ 0.03%, Nb ≤ 0.1%, V ≤ 0.1%, B < 0.005%, and N ≤ 0.008%, it being assumed that the silicon and titanium contents are such that Si + Ti ≥ 2.5% and that formula (I) is complied with. The remainder of the composition consists of iron and unavoidable impurities resulting from production. The invention also relates to the method for manufacturing a part for land-based motor vehicle from the sheet or blank by means of hot-drawing. The microstructure of the part essentially consists of martensite and intermetallic Fe₂TiSi precipitates with an area ratio of between 1% and 5% for the latter.



17.	Double-annealed steel sheet having high mechanical strength and ductility characteristics, method of manufacture and use of such sheets	CA2949855	2014-05-20	ARCELOMITTAL* ARCELOMITTAL INVESTIGACION & DESARROLLO R RUSSELL S MITTAL	2015-11-26	2015-11-26
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The invention relates to a double-annealed steel sheet, the composition of which comprises, the contents being expressed as weight percentage, $0.20\% \leq C \leq 0.40\%$, $0.8\% \leq Mn \leq 1.4\%$, $1.60\% \leq Si \leq 3.00\%$, $0.015\% \leq Nb \leq 0.150\%$, $Al \leq 0.1\%$, $Cr \leq 1.0\%$, $S \leq 0.006\%$, $P \leq 0.030\%$, $Ti \leq 0.05\%$, $V \leq 0.05\%$, $B \leq 0.003\%$, $N \leq 0.01\%$, the rest of the composition consisting of iron and unavoidable impurities resulting from the production, the microstructure consisting, in surface area proportions, of 10% to 30% of residual austenite, of 30% to 60% of annealed martensite, of 5% to 30% of bainite, of 10% to 30% of fresh martensite and of less than 10% of ferrite. It also relates to the method for manufacturing same and also to the use of such a sheet.

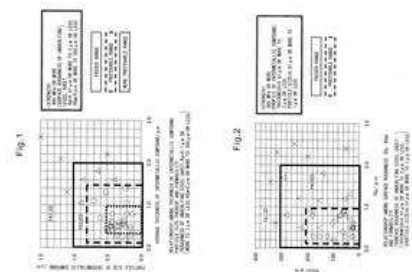
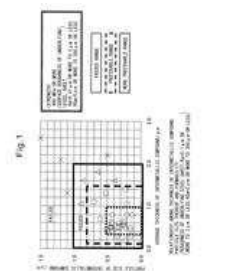
$0.20\% \leq C \leq 0.40\%$ $0.8\% \leq Mn \leq 1.4\%$ $1.60\% \leq Si \leq 3.00\%$ $0.015\% \leq Nb \leq 0.150\%$ $Al \leq 0.1\%$ $Cr \leq 1.0\%$
 $S \leq 0.006\%$ $P \leq 0.030\%$ $Ti \leq 0.05\%$ $V \leq 0.05\%$

18.	High-strength hot-pressing member and method for producing same	WO2016063467	2015-10-05	JFE STEEL*	2016-04-28	2016-04-28
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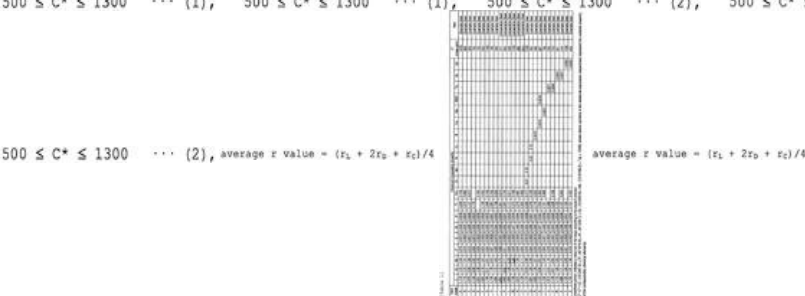
Provided are a high-strength hot-pressed part and a method for manufacturing the part. A raw material is a steel sheet obtained by heating a cold-rolled steel sheet having a chemical composition containing, by mass%, C: 0.090% or more and less than 0.30% and Mn: 3.5% or more and less than 11.0% at a temperature in a temperature range equal to or higher than the Ac1 transformation temperature and 850°C or lower, by holding the heated steel sheet at the temperature for 100 seconds or more and 48 hours or less, and by cooling the steel sheet held at the temperature. The raw material is subjected to a heating process in which the raw material is held at a temperature in a temperature range of 800°C to 1000°C for 600 seconds or less and to a hot press forming process in which the heated material is subjected to press forming and quenching at the same time by using a forming tool in order to obtain a hot-pressed part having a specified shape. With this, it is possible to obtain a high-strength hot-pressed part having a microstructure including 3.0% or more of a retained austenite phase and the balance being a martensite phase and tensile properties represented by a tensile strength TS of 1500 MPa or more and a uniform elongation uEl of 6.0% or more. Also, in the case where the cold-rolled steel sheet to be used is a steel sheet having a Zn-based coating layer or an Al-based coating layer on the surface thereof, since it is possible to inhibit the generation of scale on the surface of the part, there is an increase in the productivity of a hot-pressed part.

19.	High-strength hot-dip galvanized steel sheet	CA2850094	2012-09-28	NIPPON STEEL & SUMITOMO METAL* NIPPON STEEL & SUMITOMO MIYAMOTO MAITLAND CAPITAL	2013-04-04	2013-04-04
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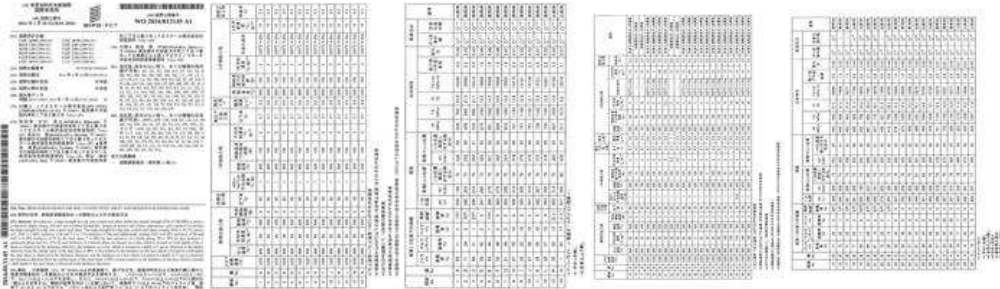
A high-strength hot-dip galvanized steel sheet which includes a steel sheet that comprises major components and that contains at least 40 vol.% the sum of bainite and martensite, 8-60 vol.% retained austenite, and less than 40 vol.% ferrite, with the remainder comprising an incidental structure. The hot-dip galvanized steel sheet has, at the interface between the deposit layer formed by hot-dip galvanization and the base steel sheet, an intermetallic compound constituted of Fe, Al, Zn, and incidental impurities and having an average thickness of 0.1-2 [μm], the intermetallic compound having a crystal grain diameter of 0.01-1 [μm]. After the deposit layer formed by hot-dip galvanization was removed, the surface of the base steel sheet has an arithmetic average roughness Ra of 0.1-2.0 [μm] and gives a roughness curve in which the contour elements have an average length RSm of 5-300 [μm]. Thus, a high-strength hot-dip galvanized steel sheet which includes a high-strength steel sheet as the base and which has excellent formability that can inhibit cracking or breaking is provided.



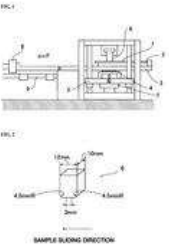
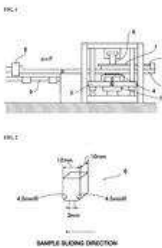
Provided is a high strength steel sheet having a high Young's modulus which has a tensile strength TS of 780 MPa or more, a Young's modulus of 205 GPa or more in the rolling direction and in a direction at an angle of 45° to the rolling direction, a Young's modulus of 220 GPa or more in a direction at a right angle to the rolling direction, an average r value of 1.05 or more, and a limiting drawing ratio (LDR) of 2.03 or more. A high strength steel sheet having a high Young's modulus, the steel sheet having a chemical composition containing, by mass%, C: 0.060% or more and 0.150% or less, Si: 0.50% or more and 2.20% or less, Mn: 1.00% or more and 3.00% or less, and one or both of Ti: 0.001% or more and 0.200% or less and Nb: 0.001% or more and 0.200% or less, in which the amount of a solid solute C (C*) calculated by a certain equation on the basis of the contents of C, N, S, Ti, and Nb satisfies relational expression (1) below, and a microstructure including ferrite in an amount of 20% or more in terms of area ratio and martensite in an amount of 5% or more in terms of area ratio, in which the average grain size of the ferrite is 20.0 μm or less, and in which the inverse intensity ratio of α -fiber for $\pm$ -fiber is 1.00 or more in each of the ferrite and the martensite: $500 \leq C^* \leq 1300$... (1), $500 \leq C^* \leq 1300$... (1), $500 \leq C^* \leq 1300$... (2), $500 \leq C^* \leq 1300$... (3), $500 \leq C^* \leq 1300$... (1), $500 \leq C^* \leq 1300$... (3),



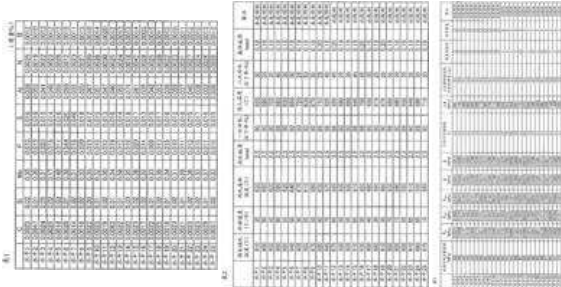
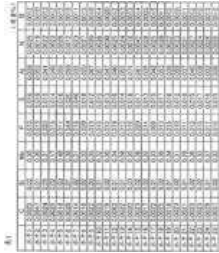
Provided are: a high-strength hot-dip zinc-coated steel sheet which has tensile strength (TS) of 780 MPa or more and is therefore highly strong, and also has excellent bendability, fatigue properties and surface appearance; and a method for producing the high-strength hot-dip zinc-coated steel sheet. The high-strength hot-dip zinc-coated steel sheet contains 0.05 to 0.15% inclusive of C, 0.01 to 1.00% inclusive of Si and 2.2 to 3.5% inclusive of Mn and additionally contains 0.01 to 0.10% inclusive of Nb and/or 0.01 to 0.10% inclusive of Ti. In the steel sheet, 5 to 80% by area inclusive of a ferrite phase, 20 to 70% by area inclusive of a martensite phase and 0 to 25% by area inclusive of a bainite phase are present on a face which is located at a half depth of the steel sheet as observed in the thickness direction, the hardness on a face which is located at a depth of 5 μm as observed in the thickness direction from the surface layer of the steel sheet is 80% or less relative to the hardness on the face which is located at a half depth of the steel sheet as observed in the thickness direction, and the hardness on a face which is located at a depth of 15 μm as observed in the thickness direction from the surface layer of the steel sheet is 90% or more relative to the hardness on the face which is located at a half depth of the steel sheet as observed in the thickness direction.



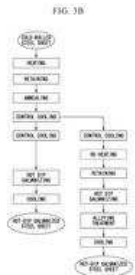
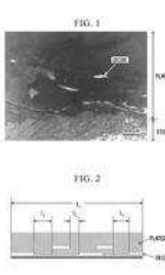
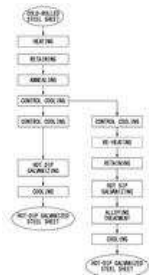
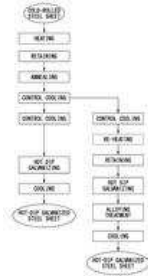
The invention provides a hot-pressing steel sheet which is excellent in oxidation resistance so as to be capable of suppressing the formation of scales and ZnO during hot pressing as well as is excellent in cold pressing properties, and a process for manufacturing a hot pressed member using the steel sheet. The hot-pressing steel sheet includes a coating layer containing 10 to 25 mass % of Ni and a balance of Zn and inevitable impurities and having a mass per unit area of 10 to 90 g/m², and a lubricating layer containing a solid lubricant, in the order named on the surface of a steel sheet.



Provided are: a steel sheet for crown caps, which has sufficient strength and formability even if reduced in thickness; a method for producing this steel sheet for crown caps; and a crown cap. A steel sheet for crown caps, which has a component composition that contains, in mass%, 0.0010% or more but less than 0.0050% of C, 0.10% or less of Si, 0.05% or more but less than 0.50% of Mn, 0.050% or less of P, 0.050% or less of S, more than 0.002% but less than 0.070% of Al, less than 0.0040% of N and from 0.0005% to 0.0020% (inclusive) of B, with the balance made up of Fe and unavoidable impurities, and which has a yield strength in the rolling direction of 500 MPa or more, an average Lankford value (r) of 1.1 or more, and an in-plane anisotropy of the Lankford value (Δr) of from -0.3 to 0.3 (inclusive).



A hot-dip galvanized steel sheet includes: a steel sheet; and a plated layer on a surface of the steel sheet, a microstructure contains, by volume fraction, equal to or more than 20% and equal to or less than 99% in total of one or two of martensite and bainite, a residual structure contains one or two of ferrite, residual austenite of less than 8% by volume fraction, and pearlite of equal to or less than 10% by volume fraction, tensile strength is equal to or greater than 980 MPa, the plated layer is a hot-dip galvanized layer which contains oxides including one or two or more of Si, Mn, and Al, contains equal to or less than 15 mass% of Fe, and a remainder including Zn, Al, and unavoidable impurities, and when a cross section including the steel sheet and the hot-dip galvanized layer is seen in a sheet thickness direction, a projected area ratio is equal to or more than 10% and equal to or less than 90%.



This high-strength cold-rolled steel sheet having excellent uniform elongation and hole expandability contains, C: 0.01 to 0.4%; Si: 0.001 to 2.5%; Mn: 0.001 to 4.0%; P: 0.001 to 0.15%; S: 0.0005 to 0.03%; Al: 0.001 to 2.0%; N: 0.0005 to 0.01%; and O: 0.0005 to 0.01%; in which Si + Al is limited to less than 1.0%, and a balance being composed of iron and inevitable impurities, in which at a sheet thickness center portion, an average value of pole densities of the {100}<011> to {223}<110> orientation group is 5.0 or less, and a pole density of the {332}<113> crystal orientation is 4.0 or less, a metal structure contains 5 to 80% of ferrite, 5 to 80% of bainite, and 1% or less of martensite in terms of an area ratio and the total of martensite, pearlite, and retained austenite is 5% or less, and an r value (rC) in a direction perpendicular to a rolling direction is 0.70 or more and an r value (r30) in a direction 30° from the rolling direction is 1.10 or less.

