Title (en)

HIGH STRENGTH STEEL SHEET HAVING EXCELLENT FORMABILITY AND METHOD FOR PRODUCTION THEREOF

Title (de)

HOCHFESTES STAHLBLECH MIT HERVORRAGENDER FORMBARKEIT UND VERFAHREN ZU SEINER HERSTELLUNG

Title (fr)

FEUILLARD EN ACIER A HAUTE RESISTANCE AYANT UNE EXCELLENTE FORMABILITE, ET SON PROCEDE DE PRODUCTION

Publication

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Application

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- JP 2001034336 A 20010209
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- JP 2001055640 A 20010228
- JP 2001055641 A 20010228
- JP 2001055642 A 20010228
- JP 2001264175 A 20010831
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Abstract (en)

[origin: EP1365037A1] A high strength steel sheet having (2-1) a base phase structure, the base phase structure being tempered martensite or tempered bainite and accounting for 50% or more in terms of a space factor relative to the whole structure, or the base phase structure comprising tempered martensite or tempered bainite which accounts for 15% or more in terms of a space factor relative to the whole structure and further comprising ferrite, the tempered martensite or the tempered bainite having a hardness which satisfies the relation of Vickers hardness (Hv)≥500ÄCÜ +30ÄSiÜ+3ÄMnÜ+50 where Ä Ü represents the content (mass %) of each element, and (2-2) a second phase structure comprising retained austenite which accounts for 3 to 30% in terms of a space factor relative to the whole structure and optionally further comprising bainite and/or martensite, the retained austenite having a C concentration (C gamma R) of 0.8% or more.

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IPC 8 full level

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Citation (search report)

- [X] EP 0997548 A1 20000503 - KOBE STEEL LTD [JP]
- [A] EP 0881306 A1 19981202 - COCKERILL RECH & DEV [BE]
- [PX] EP 1072689 A1 20010131 - USINOR [FR]
- [X] PATENT ABSTRACTS OF JAPAN vol. 2000, no. 16 8 May 2001 (2001-05-08)
- [X] PATENT ABSTRACTS OF JAPAN vol. 1996, no. 02 29 February 1996 (1996-02-29)
- [X] SUGIMOTO K ET AL: "STRETCH-FLANGEABILITY OF A HIGH-STRENGTH TRIP TYPE BAINITIC SHEET STEEL", ISIJ INTERNATIONAL, IRON AND STEEL INSTITUTE OF JAPAN, TOKYO,, JP, vol. 40, no. 9, 2000, pages 920 - 926, XP001182010, ISSN: 0915-1559
- [X] SUGIMOTO S ET AL: "EFFECTS OF RETAINED AUSTENITE PARAMETERS ON WARM STRETCH-FLANGEABILITY IN TRIP-AIDED DUAL-PHASE SHEET STEELS", ISIJ INTERNATIONAL, IRON AND STEEL INSTITUTE OF JAPAN, TOKYO,, JP, vol. 39, no. 1, 1999, pages 56 - 63, XP001182011, ISSN: 0915-1559
- [A] BASUKI A ET AL: "Effect of deformation in the intercritical area on the grain refinement of retained austenite of 0.4C trip steel", April 1999, SCRIPTA MATERIALIA, ELSEVIER, NEW YORK, NY, US, PAGE(S) 1003-1008, ISSN: 1359-6462, XP004325627
- [X] TRAINT S ET AL: "NIEDRIGLEGIERTE TRIP-FEINBLECHE MIT KUPFERZUSATZ", BHM. BERG UND HUETTENMAENNISCHE MONATSHEFTE, SPRINGER, VIENNA, AU, vol. 144, no. 9, 1999, pages 362 - 368, XP001117545, ISSN: 0005-8912
- [A] PATENT ABSTRACTS OF JAPAN vol. 2000, no. 03 30 March 2000 (2000-03-30)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1998, no. 02 30 January 1998 (1998-01-30)
- [A] PATENT ABSTRACTS OF JAPAN vol. 0183, no. 92 (C - 1228) 22 July 1994 (1994-07-22)
- See references of WO 02061161A1

Cited by

CN108026601A; EP1559798A1; EP2465962A1; EP2053140A4; EP2258886A4; EP3128023A4; EP1975266A4; EP2202327A4; CN102337480A; US2019062864A1; CN109414904A; RU2749413C2; US11268162B2; AU2017263399B2; US7591977B2; US11319607B2; US7887648B2; US8349471B2; US10385419B2; US10253389B2; US11560606B2; US11788163B2; EP2236638A1; EP2128295A4; EP2843077A4; EP3778974A4; WO2016095665A1; WO2017196965A1; US11661642B2; CN111936657A; EP3778975A4; EP2660345A4; EP3778973A4; US11643700B2; US7314532B2; US7833363B2; US11993823B2; WO2020245678A1; WO2015177582A1; WO2015177615A1; US10226800B2; US10995386B2; EP3394300B1

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