

Title (en)

Method of manufacturing sheets of steel with high levels of strength and ductility, and sheets produced using same

Title (de)

Verfahren zur Herstellung von Stahlblechen mit hoher Widerstandsfähigkeit und Duktilität und damit hergestellte Bleche

Title (fr)

Procédé de fabrication de tôles d'acier à hautes caractéristiques de résistance et de ductilité, et tôles ainsi produites

Publication

EP 2020451 A1 20090204 (FR)

Application

EP 07290908 A 20070719

Priority

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Abstract (en)

Hot-rolled steel sheet having a strength of greater than 800 MPa, and an elongation at break of greater than 10%, comprises (wt.%): carbon (0.05-0.09); manganese (1-2); aluminum (0.015-0.05); silicon (0.1-0.3); molybdenum (0.1-0.4); sulfur (= 0.01); phosphorus (= 0.025); nitrogen (0.003-0.009); vanadium (0.12-0.22); titanium (= 0.009); niobium (= 0.02); and optionally chromium (= 0.45), where the rest of the composition is constituted of iron and unavoidable impurities resulting from elaboration. Independent claims are included for: (1) a weld assembly done by the steel sheet, where the sheet is welded by beam at high energy density; and (2) a preparation of the hot-rolled steel sheet comprising supplying the steel composition, casting of semi finished product from the steel, subjecting the semi finished product to a temperature of greater than 1150[deg] C, hot-rolling the semi finished product at end temperature of rolling (TFL), where the microstructure of the steel is entirely austenitic to obtain the sheet, then cooling the sheet at a cooling speed (VR) of 75-200[deg] C/second, and coiling the sheet at a winding temperature (Tbob) of 500-600[deg] C.

Abstract (fr)

L'invention concerne une tôle d'acier laminée à chaud de résistance supérieure à 800 MPa, d'allongement à rupture supérieur à 10%, dont la composition comprend, les teneurs étant exprimées en poids : 0,050% # C # 0,090%, 1%# Mn # 2%, 0,015% # Al # 0,050 %, 0,1%# Si # 0,3%, 0,10% # Mo # 0,40%, S # 0,010%, P # 0,025%, 0,003%# N # 0,009%, 0, 12% # V # 0,22%, Ti # 0,005%, Nb # 0,020% et à titre optionnel, Cr # 0,45%, le reste de la composition étant constitué de fer et d'impuretés inévitables résultant de l'élaboration

IPC 8 full level

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CPC (source: EP KR US)

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Citation (search report)

- [X] JP 2003321739 A 20031114 - JFE STEEL KK
- [A] EP 1764423 A1 20070321 - JFE STEEL CORP [JP]
- [A] JP H1096042 A 19980414 - SUMITOMO METAL IND
- [A] JP H04358022 A 19921211 - NIPPON STEEL CORP
- [A] WO 2005005670 A1 20050120 - NIPPON STEEL CORP [JP], et al

Cited by

US11512364B2; WO2012127125A1; WO2012127136A2; US9540719B2; WO2017012958A1; WO2016005780A1; WO2016005811A1; US10858716B2; US11447844B2; EP3325684B1

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