

Title (en)

HOT-ROLLED FLAT STEEL PRODUCT CONSISTING OF A COMPLEX-PHASE STEEL HAVING A PREDOMINANTLY BAINITIC MICROSTRUCTURE AND METHOD FOR PRODUCING SUCH A FLAT STEEL PRODUCT

Title (de)

WARMGEWALZTES STAHLFLACHPRODUKT BESTEHEND AUS EINEM KOMPLEXPHASENSTAHL MIT ÜBERWIEGEND BAINITISCHEM GEFÜGE UND VERFAHREN ZUR HERSTELLUNG EINES SOLCHEN STAHLFLACHPRODUKTS

Title (fr)

PRODUIT PLAT EN ACIER LAMINÉ À CHAUD CONSTITUÉ D'UN ACIER À PHASE COMPLEXE AYANT UNE STRUCTURE ESSENTIELLEMENT BAINITIQUE ET PROCÉDÉ POUR FABRIQUER UN TEL PRODUIT PLAT EN ACIER

Publication

EP 3571324 B1 20211103 (DE)

Application

EP 18702129 A 20180116

Priority

- EP 2017051141 W 20170120
- EP 2018050963 W 20180116

Abstract (en)

[origin: WO2018134186A1] The invention relates to a hot-rolled, economically alloyed flat steel product having minimized edge-crack sensitivity characterized by a hole expansion of at least 60%, good welding suitability, a yield strength Rp0.2 of at least 660 MPa, a tensile strength Rm of at least 760 MPa, and an elongation at break A80 of at least 10%. The flat steel product is produced from a complex-phase steel, which consists of (in wt%) C: 0.01-0.1%, Si: 0.1-0.45%, Mn: 1-2.5%, Al: 0.005-0.05%, Cr: 0.5-1%, Mo: 0.05-0.15%, Nb: 0.01-0.1%, Ti: 0.05-0.2%, N: 0.001-0.009%, P: < 0.02%, S: < 0.005%, Cu: < 0.1%, Mg: < 0.0005%, O: < 0.01%, optionally one or more elements from the group "Ni, B, V, Ca, Zr, Ta, W, REM, Co" with the stipulation Ni: < 1%, B: < 0.005%, V: < 0.3%, Ca: 0.0005-0.005%, Zr, Ta, W: in total < 2%, REM: 0.0005-0.05%, Co: < 1%, and iron and unavoidable impurities as the remainder, wherein the following applies to the contents %Ti, %Nb, %N, %C, %S of Ti, Nb, N, C, and S in the complex-phase steel: (1) %Ti > (48/14) %N + (48/32) %S (2) %Nb < (93/12) %C + (45/14) %N + (45/32) %S, and wherein the microstructure of the flat steel product consists (in area %) of ≥ 80% bainite, < 15% ferrite, < 15% martensite, < 5% cementite, and < 5 vol% residual austenite. The invention further relates to a method for producing such a flat steel product.

IPC 8 full level

C21D 9/46 (2006.01); **C22C 38/22** (2006.01); **C22C 38/26** (2006.01); **C22C 38/28** (2006.01)

CPC (source: EP KR US)

C21D 8/0226 (2013.01 - EP KR US); **C21D 8/0263** (2013.01 - EP KR US); **C21D 9/46** (2013.01 - EP KR US); **C22C 38/001** (2013.01 - EP KR US); **C22C 38/02** (2013.01 - EP KR US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/22** (2013.01 - EP KR US); **C22C 38/24** (2013.01 - EP KR US); **C22C 38/26** (2013.01 - EP KR US); **C22C 38/28** (2013.01 - EP KR US); **C22C 38/32** (2013.01 - EP KR US); **C22C 38/42** (2013.01 - EP KR US); **C22C 38/44** (2013.01 - EP KR US); **C22C 38/58** (2013.01 - EP KR US); **C21D 2211/001** (2013.01 - US); **C21D 2211/002** (2013.01 - EP KR US); **C21D 2211/003** (2013.01 - US); **C21D 2211/005** (2013.01 - US); **C21D 2211/008** (2013.01 - US)

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

WO 2018134186 A1 20180726; CA 3051157 A1 20180726; CN 110291215 A 20190927; CN 110291215 B 20220329; EP 3571324 A1 20191127; EP 3571324 B1 20211103; ES 2906276 T3 20220418; JP 2020507007 A 20200305; JP 7216002 B2 20230131; KR 102500776 B1 20230217; KR 20190110562 A 20190930; MX 2019008649 A 20191216; US 11220721 B2 20220111; US 2019338384 A1 20191107

DOCDB simple family (application)

EP 2018050963 W 20180116; CA 3051157 A 20180116; CN 201880007977 A 20180116; EP 18702129 A 20180116; ES 18702129 T 20180116; JP 2019534381 A 20180116; KR 20197023249 A 20180116; MX 2019008649 A 20180116; US 201816479315 A 20180116