Title (en)

HIGH-STRENGTH STEEL SHEET WITH EXCELLENT PROCESSABILITY AND PROCESS FOR PRODUCING SAME

Title (de)

HOCHFESTES STAHLBLECH MIT AUSGEZEICHNETER VERARBEITBARKEIT UND VERFAHREN ZUR HERSTELLUNG DAVON

Title (fr)

TÔLE D'ACIER À RÉSISTANCE ÉLEVÉE PRÉSENTANT UNE EXCELLENTE APTITUDE AU TRAITEMENT AINSI QUE PROCÉDÉ DE FABRICATION ASSOCIÉ

Publication

EP 2589678 B1 20180905 (EN)

Application

EP 11801026 A 20110629

Priority

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- JP 2011065415 W 20110629

Abstract (en)

[origin: EP2589678A1] A thin high strength steel sheet having excellent formability and a method for manufacturing the sheet are provided. A hot rolling step of hot-rolling a steel having a composition which includes, by mass%, 0.08 to 0.15% of C, 0.5 to 1.5% of Si, 0.5 to 1.5% of Mn, 0.01 to 0.1% of Al, and 0.005% or less of N to form a hot rolled sheet is conducted. After the hot-rolled sheet is pickled, the hot rolled sheet is subjected to an annealing treatment of holding the hot rolled sheet in a first temperature region of an A c1 transformation point to an A c3 transformation point for 5 to 400 s by a continuous annealing line without cold rolling; and to a cooling treatment of cooling the sheet at an average cooling rate of 5°C/s or higher from the first temperature region to 700°C and adjusting a residence time in a second temperature region of 700°C to 400°C in the range of 30 to 400 s. As a result, a microstructure composed of a ferrite phase having an area fraction in the range of 75 to 90% with respect to the entire microstructure and a second phase including pearlite, the second phase having an area fraction in the range of 10 to 25% can be obtained. The pearlite accounts for 70% or more in terms of the area fraction with respect to the entire second phase and the average grain size of the pearlite is 5 μm or smaller. Thus, a high strength steel sheet with excellent formability having a high strength, i.e., a tensile strength TS of 540 MPa or more, excellent elongation, and excellent stretch flangeability can be obtained.

IPC 8 full level

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CPC (source: EP KR US)

C21D 8/0226 (2013.01 - EP US); **C21D 8/0263** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP KR US); **C22C 38/001** (2013.01 - EP US); **C22C 38/005** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/08** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/18** (2013.01 - EP US); **C22C 38/54** (2013.01 - KR); C21D 2211/005 (2013.01 - EP US); C21D 2211/009 (2013.01 - EP US)

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