

Title (en)

High-strength cold-rolled steel sheet excellent in coating film adhesion

Title (de)

Hochfestes, Kaltgewalztes Stahlblech mit Ausgezeichneter Adhesion von Beschichtung

Title (fr)

Tôle d'acier à résistance élevée laminée à froid, ayant une excellente adhésivité d'une couche de revêtement

Publication

**EP 1548142 B2 20130703 (EN)**

Application

**EP 04028368 A 20041130**

Priority

JP 2003429151 A 20031225

Abstract (en)

[origin: EP1548142A1] A cold-rolled steel sheet of DP (Dual Phase) type with a specific composition meets the requirements: (I) In the surface of the steel sheet, there exist Si-Mn complex oxides no larger than 5  $\mu\text{m}$  in diameter of the equivalent circle as many as 10 or more per 100  $\mu\text{m}^2$  and the coverage of oxides composed mainly of Si on the surface of steel sheet is no more than 10% of surface area, and/or (II) The cross section near the surface of the steel sheet does not show cracks with a width no larger than 3  $\mu\text{m}$  and a depth no smaller than 5  $\mu\text{m}$  in arbitrary ten fields of observation under an SEM with a magnification of 2000. A high-strength cold-rolled steel sheet excellent in coating film adhesion and having a tensile strength no lower than 550 MPa is provided.

IPC 8 full level

**C22C 38/00** (2006.01); **C22C 38/02** (2006.01); **C21D 9/48** (2006.01); **C22C 38/04** (2006.01); **C23C 2/02** (2006.01); **C23C 2/06** (2006.01); **C23C 30/00** (2006.01); **C21D 8/02** (2006.01)

CPC (source: EP US)

**C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C23C 30/00** (2013.01 - EP US); **C21D 8/0226** (2013.01 - EP US); **C21D 8/0236** (2013.01 - EP US); **C21D 8/0278** (2013.01 - EP US); **C21D 2211/005** (2013.01 - EP US); **C21D 2211/008** (2013.01 - EP US)

Citation (opposition)

Opponent :

- EP 1367143 A1 20031203 - NIPPON KOKAN KK [JP]
- US 2003047256 A1 20030313 - KAMI CHIKARA [JP], et al
- US 6410163 B1 20020625 - SUZUKI YOSHITSUGU [JP], et al

Cited by

EP2028282A1; CN102317490A; EP2785889A4; EP2623630A4; EP3421634A1; EP1865085A4; EP2671960A1; EP2671961A1; EP2679699A3; EP2123786A1; RU2470087C2; GB2433746A; GB2433746B; EP3418419A4; US10449751B2; US9598743B2; US8986468B2; WO2008102009A1; WO2009021897A1; US9534270B2; US10190187B2; US8801873B2; US10612113B2; US11453926B2; WO2015014333A3; WO2009150319A1; US9085816B2; EP2829626B1

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