Title (en)

Cold rolled steel flat product for deep drawing applications and method for its production

Title (de)

Kaltgewalztes Stahlflachprodukt für Tiefziehanwendungen und Verfahren zu seiner Herstellung

Title (fr)

Produit plat en acier laminé à froid pour applications d'emboutissage profond et son procédé de fabrication

Publication

EP 2767601 B1 20181010 (DE)

Application

EP 13155225 A 20130214

Priority

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Abstract (en)

[origin: EP2767601A1] The cold-rolled flat product made of steel, is claimed. The steel contains iron, unavoidable impurities, carbon, aluminum, niobium, titanium, phosphorus, sulfur, nitrogen, and optionally elements including manganese, rare earth metal, silicon, zirconium, vanadium, tungsten, molybdenum, chromium, cobalt, nickel, boron, copper and calcium. The product has deep drawability (r-value) of 1.3, and contains 0-0.1 vol.% of carbides. A ratio of a grain length in a rolling direction to a width in a transverse direction of a grain of the flat steel product is less than 1.5. The cold-rolled flat product made of steel, is claimed. The steel contains iron, unavoidable impurities, 0.05 wt.% of carbon, 6.8 wt.% of aluminum, 0.1-0.15 wt.% of niobium, 0.15-0.3 wt.% of titanium, less than 0.1 wt.% of phosphorus, less than 0.03 wt.% of sulfur, less than 0.1 wt.% of nitrogen, and optionally elements including 0-0.1 wt.% of manganese, 0-0.2 wt.% of rare earth metal, 0-2 wt.% of silicon, 0-1 wt.% of zirconium, 0-1 wt.% of vanadium, 0-1 wt.% of tungsten, 0-1 wt.% of molybdenum, 0-3 wt.% of chromium, 0-1 wt.% of cobalt, 0-2 wt.% of nickel, 0-0.1 wt.% of boron, 0-3 wt. % of copper and 0-0.015 wt.% of calcium. A ratio of titanium to niobium is 1.5-2.5. The product has deep drawability (r-value) of 1.3, and contains 0-0.1 vol.% of carbides. A ratio of a grain length in a rolling direction to a width in a transverse direction of a grain of the flat steel product is less than 1.5 An independent claim is included for a method of producing a cold-rolled flat product.

IPC 8 full level

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C21D 1/26 (2013.01 - EP US); **C21D 6/004** (2013.01 - EP US); **C21D 6/005** (2013.01 - EP US); **C21D 6/008** (2013.01 - EP US); **C21D 8/0263** (2013.01 - EP US); **C21D 8/0405** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP US); **C21D 9/48** (2013.01 - EP US); **C22C 38/001** (2013.01 - US); **C22C 38/004** (2013.01 - US); **C22C 38/02** (2013.01 - US); **C22C 38/04** (2013.01 - US); **C22C 38/06** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/44** (2013.01 - US); **C22C 38/46** (2013.01 - US); **C22C 38/48** (2013.01 - US); **C22C 38/50** (2013.01 - US); C21D 8/0226 (2013.01 - EP US); C21D 8/0236 (2013.01 - EP US); C21D 2211/004 (2013.01 - EP US); C21D 2211/005 (2013.01 - EP US)

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