

Title (en)

COLD-ROLLED FLAT STEEL PRODUCT HAVING METAL ANTI-CORROSION LAYER AND METHOD FOR PRODUCING SAME

Title (de)

KALTGEWALZTES STAHLFLACHPRODUKT MIT METALLISCHER KORROSIONSSCHUTZSCHICHT UND VERFAHREN ZUR HERSTELLUNG EINES SOLCHEN

Title (fr)

PRODUIT EN ACIER PLAT LAMINÉ À FROID PRÉSENTANT UNE COUCHE MÉTALLIQUE DE PROTECTION CONTRE LA CORROSION ET PROCÉDÉ POUR LA FABRICATION D'UN TEL ACIER

Publication

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Application

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Abstract (en)

[origin: WO2019121793A1] The invention describes a method for producing a cold-rolled flat steel product having a metal anti-corrosion layer. The method comprises the work steps: melting a steel melt which contains, in addition to iron and unavoidable impurities, (in wt.%): C: 0.01-0.35%, Mn: 1-4%, Si: 0.5-2.5%, Nb: up to 0.1%, Ti: 0.015-0.1%, P: up to 0.1%, Al: up to 0.15%, S: up to 0.01%, N: up to 0.1%, and optionally one or more elements from the group of rare earth metals, Mo, Cr, Zr, V, W, Co, Ni, B, Cu, Ca, with rare earth metals: up to 0.2%, Mo: up to 1%, Cr: up to 3%, Zr: up to 1%, V: up to 1%, W: up to 1%, Co: up to 1%, Ni: up to 2%, B: up to 0.1%, Cu: up to 3%, Ca: up to 0.015%; casting the steel melt to form a semi-finished product; hot-rolling the semi-finished product to form a hot strip, wherein the hot-rolling temperature is 820–1000°C; winding the hot strip to form a coil, wherein the winding temperature is in the range between room temperature and 750°C; annealing the hot strip at an annealing temperature of more than 530°C and up to 950°C for an annealing duration of 1-50 hours; cold-rolling the annealed hot strip to form a cold-rolled flat steel product in one or more stages with a total cold-rolling degree of at least 45%; final annealing of the cold-rolled flat steel product at a final annealing temperature of 650–920°C for an annealing duration of 30-1500 seconds, wherein as a result of the final annealing of the cold-rolled flat steel product, an Si enrichment layer is created between a surface and a base material of the cold-rolled and finally-annealed flat steel product, the maximum Si content of which is higher by a factor of between 3 and 8 than the Si content of the base material and which has a depth of between 10 nm and 1 µm; and applying a zinc-based metal anti-corrosion layer by means of electrolytic galvanising or hot dip galvanising of the cold-rolled and finally-annealed flat steel product.

IPC 8 full level

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