

Title (en)

Method of making high silicon, low carbon regular grain oriented silicon steel

Title (de)

Verfahren zum Herstellen von normal kornorientiertem Stahl mit hohem Silizium- und niedrigem Kohlenstoffgehalt

Title (fr)

Procédé de fabrication d'acier ordinaire à haute teneur en silicium, à basse teneur en carbone et à grains orientés

Publication

**EP 0538519 B1 19980107 (EN)**

Application

**EP 91309686 A 19911021**

Priority

EP 91309686 A 19911021

Abstract (en)

[origin: EP0538519A1] A process of producing high silicon, low melt carbon regular grain electrical silicon steel having a final gauge of from 14 mils (0.35 mm) to about 6 mils (0.15 mm) or less, including the steps of providing a hot band and removing the hot band scale, if needed. The silicon steel is cold rolled to intermediate gauge and subjected to an intermediate anneal at a soak temperature of about 1650 DEG F (900 DEG C) to about 1700 DEG F (930 DEG C). Thereafter, the silicon steel is cooled in a first stage slow cooling at a rate of about 500 DEG F (280 DEG C) to about 1050 DEG F (585 DEG C) per minute down to about 1100 DEG F +/- 50 DEG F (595 DEG C +/- 30 DEG C). The silicon steel is then subjected to a second stage fast cooling down to from about 600 DEG F (315 DEG C) to about 1000 DEG F (540 DEG C) at a cooling rate of from about 2500 DEG F (1390 DEG C) to about 3500 DEG F (1945 DEG C) per minute followed by a water quench. The silicon steel is cold rolled to final gauge, decarburized, coated with an annealing separator and final annealed. Preferably, but optionally, the hot band is annealed prior to the first cold rolling. Preferably, but optionally, the final gauge silicon steel prior to decarburization is subject to an ultra-rapid annealing treatment at a rate greater than 180 DEG F (100 DEG C) per second to a temperature greater than 1250 DEG F (675 DEG C). <IMAGE>

IPC 1-7

**C21D 8/12**; **C21D 9/52**

IPC 8 full level

**C21D 8/12** (2006.01); **C21D 9/52** (2006.01)

CPC (source: EP)

**C21D 8/1266** (2013.01); **C21D 9/52** (2013.01); **C21D 8/1244** (2013.01); **C21D 8/1261** (2013.01)

Cited by

US6241829B1; CN103725995A; EP1795617A1; CN102330021A; CN115449696A; US9240265B2; US9997283B2

Designated contracting state (EPC)

DE FR GB IT SE

DOCDB simple family (publication)

**EP 0538519 A1 19930428**; **EP 0538519 B1 19980107**; **EP 0538519 B2 20010613**; CN 1033653 C 19961225; CN 1071960 A 19930512; DE 69128624 D1 19980212; DE 69128624 T2 19980423; DE 69128624 T3 20020529

DOCDB simple family (application)

**EP 91309686 A 19911021**; CN 91108401 A 19911029; DE 69128624 T 19911021