

Title (en)

Process for producing grain-oriented electrical steel sheet having high magnetic flux density

Title (de)

Verfahren zum Herstellen kornorientierter Elektrobleche mit hoher magnetischer Flussdichte

Title (fr)

Procédé de fabrication d'une tôle en acier électromagnétique à grain orienté ayant une haute densité de flux magnétique

Publication

**EP 0390142 B1 19960626 (EN)**

Application

**EP 90106018 A 19900329**

Priority

- JP 7999189 A 19890330
- JP 7999289 A 19890330

Abstract (en)

[origin: EP0390142A2] A process for producing a grain-oriented electrical steel sheet having a high magnetic flux density, comprising the steps of: heating a steel slab comprising 1.8 to 4.8 wt% Si, 0.012 to 0.050 wt% acid-soluble Al, 0.010 wt% or less N, and the balance consisting of Fe and unavoidable impurities, to a temperature for hot rolling; hot-rolling the heated slab to form a hot-rolled strip; cold-rolling the hot-rolled strip to a final product sheet thickness at a final cold rolling reduction of 80% or more by a single step of cold rolling or by two or more steps of cold rolling with an intermediate annealing step inserted therebetween; primary-recrystallization-annealing the cold-rolled strip; final-annealing the primary-recrystallization-annealed strip so that secondary-recrystallized grains substantially completely grow up in a temperature region of from 1000 to 1100 DEG C and then purification is effected above 1100 DEG C; and subjecting the primary-recrystallization-annealed steel strip to a nitriding treatment before a secondary recrystallization occurs during the final annealing.

IPC 1-7

**C21D 8/12**

IPC 8 full level

**C21D 8/12** (2006.01)

CPC (source: EP)

**C21D 8/1255** (2013.01); **C21D 8/1272** (2013.01)

Cited by

US5261972A; EP0585956A1; EP0600181A1; DE4311151C1; US5266129A; EP0566986A1; US5512110A; EP2107130A1; EP1179603A3; EP0588342A1; US5858126A; DE10311215A1; DE10311215B4; EP0526834A1; US5354389A; US5489342A; US6858095B2

Designated contracting state (EPC)

DE FR GB IT SE

DOCDB simple family (publication)

**EP 0390142 A2 19901003; EP 0390142 A3 19920930; EP 0390142 B1 19960626; EP 0390142 B2 19990428**; DE 69027553 D1 19960801; DE 69027553 T2 19970220; DE 69027553 T3 19991111

DOCDB simple family (application)

**EP 90106018 A 19900329**; DE 69027553 T 19900329