

Title (en)  
ELECTRICAL STEEL SHEET AND PRODUCTION METHOD THEREFOR

Title (de)  
ELEKTROBLECH UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)  
TÔLE D'ACIER ÉLECTRIQUE ET SON PROCÉDÉ DE PRODUCTION

Publication  
**EP 3438314 B1 20201230 (EN)**

Application  
**EP 17775283 A 20170329**

Priority  
• JP 2016071619 A 20160331  
• JP 2017013027 W 20170329

Abstract (en)  
[origin: EP3438314A1] Provided are an electrical steel sheet having a high saturation magnetic flux density and a low iron-loss at high frequencies and a method for producing the electrical steel sheet. The electrical steel sheet includes, with a symmetry plane being the center of the steel sheet in the thickness direction, a surface part in which the Si concentration in the steel sheet changes continuously from a high Si concentration to a low Si concentration in the thickness direction of the steel sheet from the surface of the steel sheet, a boundary part in which the Si concentration changes discontinuously, and an inner part in which the Si concentration does not change substantially in the thickness direction of the steel sheet, the inner part including the center of the steel sheet in the thickness direction. An in-plane tensile stress is generated in the surface part. An in-plane compressive stress is generated in the inner part. The average aspect ratio of crystal grains included in the surface part, that is, the ratio of the dimension of the crystal grains in a direction parallel to the surface of the steel sheet to the dimension of the crystal grains in a direction (depth direction) perpendicular to the surface of the steel sheet, is 0.7 or more and 4.0 or less.

IPC 8 full level  
**C22C 38/00** (2006.01); **C21D 1/74** (2006.01); **C21D 6/00** (2006.01); **C21D 8/12** (2006.01); **C21D 9/46** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C23C 10/08** (2006.01); **C23C 10/60** (2006.01); **H01F 1/147** (2006.01)

CPC (source: EP KR US)  
**C21D 1/74** (2013.01 - EP US); **C21D 6/008** (2013.01 - EP US); **C21D 8/12** (2013.01 - EP US); **C21D 8/1255** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP KR US); **C22C 38/001** (2013.01 - EP KR US); **C22C 38/002** (2013.01 - EP US); **C22C 38/004** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP KR US); **C22C 38/04** (2013.01 - EP KR US); **C22C 38/06** (2013.01 - EP KR US); **C23C 10/08** (2013.01 - EP KR US); **C23C 10/60** (2013.01 - EP KR US); **H01F 1/147** (2013.01 - KR); **H01F 1/14775** (2013.01 - EP US); **C21D 2211/001** (2013.01 - EP US); **C21D 2211/005** (2013.01 - EP US)

Cited by  
EP3816312A4; US11355271B2; US11551839B2; EP3957758A4

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**EP 3438314 A1 20190206; EP 3438314 A4 20190220; EP 3438314 B1 20201230**; CN 108884535 A 20181123; CN 108884535 B 20200818; JP 6319522 B2 20180509; JP WO2017170749 A1 20180405; KR 102129846 B1 20200703; KR 20180120717 A 20181106; US 2019112697 A1 20190418; WO 2017170749 A1 20171005

DOCDB simple family (application)  
**EP 17775283 A 20170329**; CN 201780020662 A 20170329; JP 2017013027 W 20170329; JP 2017541118 A 20170329; KR 20187027928 A 20170329; US 201716089734 A 20170329