

ABSTRACT

NON-ORIENTED ELECTRICAL STEEL SHEET AND METHOD OF PRODUCING SAME

Disclosed is a non-oriented electrical steel sheet having low iron loss
5 in a frequency range of about 400 Hz. The non-oriented electrical steel sheet
comprises an inner layer and surface layers, and has a chemical composition
containing: Si; and C: 0.020 mass% or less, Mn: 0.010 mass% to 2.0 mass%,
and S: 0.0100 mass% or less, as average contents in the total sheet thickness,
with the balance being Fe and inevitable impurities, wherein each of the surface
10 layers has an average Si content $[Si]_1$ of 2.5 mass% to 7.0 mass%, the inner
layer has an average Si content $[Si]_0$ of 1.5 mass% to 5.0 mass%, each of the
surface layers has an in-plane tensile stress of 5 MPa to 50 MPa, the non-
oriented electrical steel sheet has a sheet thickness t of 0.01 mm to 0.35 mm,
the surface layers have a total thickness t_1 with a ratio t_1/t of the total thickness
15 t_1 to the sheet thickness t being 0.10 to 0.70, the non-oriented electrical steel
sheet has an average N content $[N]$ in the total sheet thickness of 40 ppm or
less, and an iron loss $W_{10/400}$ in W/kg at a maximum magnetic flux density of
1.0 T and a frequency of 400 Hz and the sheet thickness t in mm satisfy the
following formula (1):

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$$W_{10/400} \leq 8 + 30t \dots (1).$$