SLOVENSKI STANDARD
SIST EN 10107:2005

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Orientirana elektroploļevina in trakovi, dobavljeni v konļnem ģarjenem stanju

Grain-oriented electrical steel sheet and strip delivered in the fully processed state

Kornorientiertes Elektroblech und -band im schlussgeglühten Zustand

Tôles et bandes magnétiques en acier a grains orientés livrées a l'état fini

Ta slovenski standard je istoveten z: EN 10107:2005

ICS:

77.140.50	Ploģļati jekleni izdelki in polizdelki	Flat steel products and semi-products

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English Version

Grain-oriented electrical steel sheet and strip delivered in the fully processed state

Tôles et bandes magnétiques en acier à grains orientés livrées à l'état fini

Kornorientiertes Elektroblech und -band im schlussgeglühten Zustand

This European Standard was approved by CEN on 27 June 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This European Standard (EN 10107:2005) has been prepared by Technical Committee ECISS/TC 24 “Electrical steel sheet and strip qualities - Qualities, dimensions, tolerances and specific tests”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

This document supersedes EN 10107:1995.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies the steel grades of grain-oriented electrical sheet and strip in nominal thicknesses of 0,23 mm, 0,27 mm, 0,30 mm and 0,35 mm; in particular, general requirements, magnetic properties, geometric characteristics and tolerances and technological characteristics, as well as inspection procedures.

This European Standard applies to Goss textured grain-oriented magnetic sheet steel supplied in the final annealed condition in sheets or coils, and intended for the construction of magnetic circuits.

The materials are grouped into two classes :

a) conventional grain oriented material ;

b) high permeability grain oriented material .

They correspond to Clause C22 of IEC 60404-1:2000.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10021, *General technical delivery requirements for steel and iron products*

EN 10027-1, *Designation systems for steel - Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10204, *Metallic products — Types of inspection documents*

EN 10251, *Magnetic materials - Methods of determination of the geometrical characteristics of electrical steel sheet and strip*

EN 10280, *Magnetic materials — Methods of measurement of the magnetic properties of electrical sheet and strip by means of a single sheet tester*

EN 10282:2001, *Magnetic materials — Method of test for the determination of surface insulation resistance of electrical sheet and strip*

EN 60404-2, *Magnetic materials — Part 2: Methods of measurement of the magnetic properties of electrical steel sheet and strip by means of an Epstein frame (IEC 60404-2:1996)*

EN ISO 7799, *Metallic materials — Sheet and strip 3 mm thick or less — Reverse bend test (ISO 7799:1985)*

IEC 60050-121:1998, *International Electrotechnical Vocabulary — Chapter 121: Electromagnetism*

IEC 60050-221:1990, *International Electrotechnical Vocabulary — Chapter 221: Magnetic materials and components*

IEC 60404-1:2000, *Magnetic materials — Part 1: Classification*

IEC 60404-13, *Magnetic materials — Part 13: Methods of measurement of density, resistivity and stacking factor of electrical steel sheet and strip*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions of the principal terms relative to magnetic properties given in IEC 60050-121:1998 and IEC 60050-221:1990 and the following apply.

3.1
edge camber
greatest distance between a longitudinal edge of the sheet and the line joining the two extremities of the measured length of this edge

3.2
flatness
property of a sheet or of a length of strip which is characterized by the wave factor i.e. by the relation of the height of the wave to its length

3.3
number of bends
number of alternate bends possible before the appearance of the first crack in the base metal visible to the naked eye indicating the ductility of the material

3.4
internal stresses
stresses which are characterized by a deviation in relation to the line of cutting

4 Classification and designation

4.1 Classification

The steel grades covered by this European Standard are classified according to the value of maximum specific total loss in watts per kilogram and according to the nominal thickness of the material (0,23 mm, 0,27 mm, 0,30 mm, 0,35 mm).

4.2 Designation

4.2.1 For the steel grades covered by this European Standard, the steel names are allocated in accordance with EN 10027-1. The steel numbers are allocated in accordance with EN 10027-2.

4.2.2 The steel names comprise the following in the order given :

a) capital letter M for electrical steel,

b) a number of one hundred times the specified value of maximum specific total loss at 50 Hz, in watts per kilogram corresponding to the nominal product thickness, at 1,7 T,

c) one hundred times the nominal thickness of the product, in millimetres,

d) the characteristic letter :

— S for conventional grain oriented products ;

— P for high permeability grain oriented products.

EXAMPLE Conventional grain oriented electrical steel sheet or strip with a maximum specific total loss at 1,7 T of 1,50 W/kg at 50 Hz and a nominal thickness of 0,30 mm, supplied in the fully processed state:

M150-30S

5 Information to be supplied by the purchaser

5.1 Mandatory information

For material to comply adequately with the requirements of this standard, the purchaser shall include the following information in his enquiry or order :

a) quantity,

b) type of product (strip or sheet),

c) number of this European Standard (EN 10107),

d) steel name or number (see 4.2.1),

e) dimensions of sheets or strips required (including any limitations on the external diameter of a coil) (see 6.2 and 7.2.2),

f) limitations on the mass of a bundle of sheets or of a coil (see 6.2),

g) residual curvature for coils (see 7.2.6),

h) minimum insulation coating resistance (see 7.3.5),

i) inspection procedure required including the nature of the related documents (see 8.1).

5.2 Options

A number of options are specified in this standard and listed below. If the purchaser does not indicate his wish to implement one of these options, the products shall be supplied in accordance with the basis specification of this standard (see 5.1).

a) permissibility of welds and its marking (see 6.2);

b) compatibility between fluid and coating (see 6.4, NOTE);

c) plus tolerances for nominal width (see Table 3, footnote a);

d) requirement concerning residual curvature (see 7.2.6);

e) acceptance unit other than 3 t (see 8.1);

f) test temperature other than (23 ± 5) °C (see 8.4.1);

g) alternative method for determination of magnetic properties (see 8.4.2, NOTE);

h) marking of the products (see Clause 9).

6 General requirements

6.1 Production process

The production process of the steel and its chemical composition are left to the discretion of the manufacturer.

6.2 Form of supply

The material is supplied in bundles in the case of sheets and in coils in the case of strip.

The mass of bundles of sheets or of coils shall be agreed at the time of enquiry and order.

The recommended value for the internal diameter of coils is approximately 508 mm.

Sheets which make up each bundle shall be stacked so that the side faces are substantially flat and approximately perpendicular to the top face.

Strip shall be of constant width and wound in such a manner that the edges are superimposed in a regular manner and that the side faces of the coil are substantially flat.

Coils shall be sufficiently tightly wound so that they do not collapse under their own weight.

Strip may exhibit welds resulting from the removal of defective zones if agreed at the time of enquiry and order. If necessary the marking of welds may be agreed at the time of enquiry and order.

For coils containing welds, each part of the strip shall be of the same grade.

The edges of parts welded together shall not be so much out of alignment as to affect the further processing of the material.

6.3 Delivery condition

Grain-oriented products are usually supplied with an insulating coating on both sides. This coating generally consists of a so called glass film composed essentially of silicates of magnesium on which has been deposited a second coating of inorganic constituents such as phosphates, normally as part of a thermal flattening operation [1)].

6.4 Surface condition

The surfaces shall be smooth and clean, free from grease and rust [2)]. Dispersed defects such as scratches, blisters, cracks, etc., are permitted if they are within the limits of the tolerances on thickness and if they are not detrimental to the correct use of the supplied material.

The insulation coating present on the surface of the material shall be sufficiently adherent so that it does not become detached during cutting operations or heat treatment under conditions specified by the supplier.

NOTE If the product is to be immersed in a fluid, an agreement, initiated by the purchaser, should be reached to ensure compatibility between the fluid and the coating.

6.5 Suitability for cutting

The material shall be able to be cut at any point and into the usual shapes thus ensuring accurate working with the correct cutting tools.

7 Technical requirements

7.1 Magnetic properties

7.1.1 General

The properties defined in 7.1.2 and 7.1.3 are applicable to materials in the delivery conditions defined in 6.3.

7.1.2 Magnetic polarization

1) Other types of coating exist which are used only when particularly specified.
2) Not to be confused with some colouration of the insulating coating inherent in the manufacturing process.