SLOVENSKI STANDARD
oSIST prEN 10265:2024

01-februar-2024

Magnetni materiali - Specifikacija električnih jeklenih trakov in pločevin s specifičnimi mehanskimi lastnostmi in magnetno polarizacijo

Magnetics materials - Specification for electrical steel strip and sheet with specified mechanical properties and magnetic polarisation

Magnetische Werkstoffe - Anforderungen an Elektroband und -blech mit festgelegten mechanischen Eigenschaften und magnetischer Polarisation

Matériaux magnétiques - Spécification pour les bandes et tôles en acier électrique à caractéristiques mécaniques et polarisation magnétique spécifiées

Ta slovenski standard je istoveten z: **prEN 10265**

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29.030	Magnetni materiali	Magnetic materials
77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products

oSIST prEN 10265:2024 **en,fr,de**

EUROPEAN STANDARD

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English Version

Magnetics materials - Specification for electrical steel strip and sheet with specified mechanical properties and magnetic polarisation

Matériaux magnétiques - Spécification pour les bandes et tôles en acier électrique à caractéristiques mécaniques et polarisation magnétique spécifiées

Magnetische Werkstoffe - Anforderungen an Elektroband und -blech mit festgelegten mechanischen Eigenschaften und magnetischer Polarisation

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 8.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 10265:2023) has been prepared by Technical Committee CEN/TC 459/SC 8 “Steel sheet and strip for electrical applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 10265:1995.

In comparison with the previous edition EN 10265:1995, the following technical modifications have been made:

— the title of the document has been amended;

— to take into account the revision of the geometrical characterisation of FprEN 10251;

— to include the residual curvature for sheets regarding the internal coil diameter for hot-rolled grades;

— to clarify in the surface condition text how precautions against oxidation can be taken;

— to include in the technical requirements too higher strength new cold-rolled grades;

— to rationalize the tables in the geometrical characteristics and tolerances;

— to clarify the density to be used for the magnetic measurements;

— to reduce the minimum number of Epstein test strips for the magnetic property measurement;

— to add a paragraph on the marking, labelling and packaging;

— to add a clarification on the information to be supplied by the purchaser.

1 Scope

This document defines the grades of electrical steel strip and sheet with specified mechanical properties and magnetic polarization. It specifies general requirements, mechanical properties, magnetic polarization, geometric characteristics, tolerances and technological characteristics, as well as inspection procedures.

This document applies to electrical steel strip and sheet for the construction of poles and rims of rotating electrical machines.

The grades are grouped into two classes according to their manufacturing process:

— hot-rolled grades;

— cold-rolled grades.

NOTE These materials correspond to EN 60404-1:2017, D.2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 conditions for steel products*

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

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

FprEN 10251:2023, *Magnetic materials — Methods of determination of the geometrical characteristics of electrical steel sheet and strip*

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

EN 60404-4, *Magnetic materials — Part 4: Methods of measurement of d.c. magnetic properties of magnetically soft materials*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

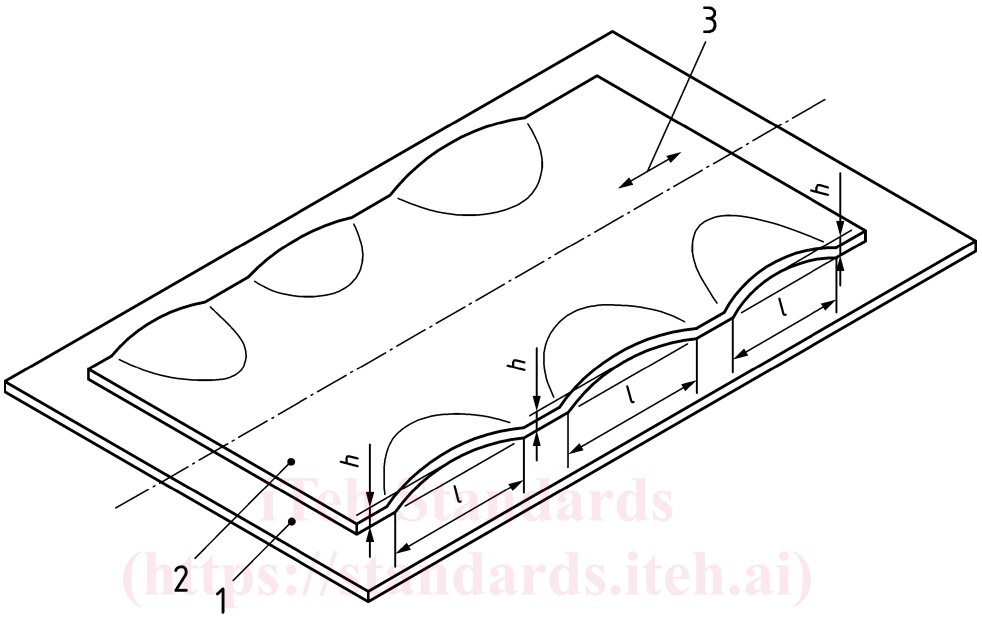
— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
edge wave
wave factor
variation of flatness of a length of strip or sheet taking a form of waves at the slit edge of the product after longitudinal side trimming or slitting of the product; characterised by the wave factor, i.e. by the relation of the height of the wave to its length

Note 1 to entry: For examples of waves, see Figure 1.

[SOURCE: FprEN 10251:2023, definition 3.1]



Key

1	flat surface	*h*	height of wave (mm)
2	sheet	*l*	length of wave (mm)
3	rolling direction		

Figure 1 — Example of wave

3.2
residual curvature
variations of flatness of a length of unwound strip or a sheet taking a permanent curvature in the direction of rolling of the product

[SOURCE: FprEN 10251:2023, definition 3.2]

3.3
edge camber
greatest distance between a longitudinal edge of a length of strip or a sheet and the line joining the two extremities of the measured length of this edge

Note 1 to entry: See Figure 2.

[SOURCE: FprEN 10251:2023, definition 3.3]

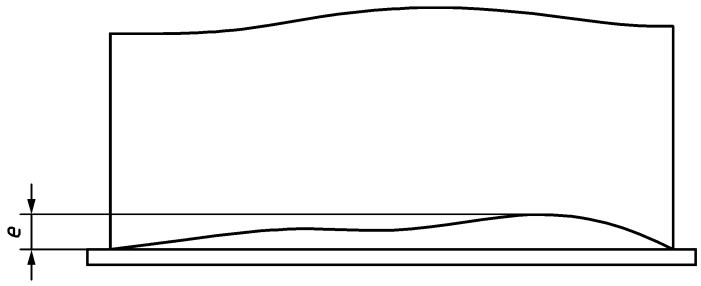


Figure 2 — Verification of the edge camber

4 Classification

The grades covered by this document are classified according to the specified value of the minimum proof strength $R_{p0,2}$, in MPa [1], according to the specified value of the minimum magnetic polarization at a DC magnetic field strength of 15 000 A/m, in T, and according to the nominal thickness of the product [2], in mm.

The grades are classified in two groups according to their manufacturing process: hot-rolled materials and cold-rolled materials.

5 Designation

5.1 The conventional designation[3] of the different grades comprises the following in the order given:

1) the specified minimum value of the minimum proof strength $R_{p0,2}$, in MPa;

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

3) the characteristic letters:

   a) "TG" for hot-rolled grades;

   b) "TF" for cold-rolled grades;

4) one hundred times the specified value of minimum magnetic polarization at a DC magnetic field strength of 15 000 A/m, in T.

EXAMPLE 350-100-TF 181 for a cold-rolled electrical steel strip and sheet with a minimum proof strength $R_{p0,2}$ of 350 MPa, a nominal thickness of 1,0 mm, and a minimum magnetic polarization 1,81 T at a DC magnetic field strength of 15 000 A/m.

5.2 The numerical designation shall be in accordance with EN 10027-2.

[1] 1 MPa = 1 N/mm^2.
[2] In the rest of the document, the word "product" is used to mean "strip and sheet".
[3] The designation of steel products specified in this document is not included in EN 10027-1; therefore the designations used are those from prEN 60404-8-5.

6 General requirements

6.1 Production process

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

6.2 Form of supply

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

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

The internal diameter of coils shall be agreed between the manufacturer and the purchaser at the time of enquiry and order. The recommended value for the internal diameter of coils is approximately 760 mm or 610 mm for hot-rolled grades, and approximately 508 mm for cold-rolled grades.

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

Coils shall be sufficiently tightly wound in order that they do not collapse under their own weight, strip may exhibit welds or interleaves resulting from the removal of defective zones or from the joining of several lengths to obtain the sizes of the coils required by the purchaser at the time of enquiry and order. If necessary, the marking of welds or interleaves may be agreed between the manufacturer and the purchaser at the time of enquiry and order.

For coils containing repair welds or interleaves, 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 product.

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

Products supplied in sheets shall not contain any welds.

6.3 Delivery condition

The product is normally supplied without insulation. By agreement between the purchaser at the time of enquiry and order, the product may be supplied with insulation on one or both sides. If the product is supplied with insulation, the nature of the insulation, its properties and their verification shall be agreed between the manufacturer and the purchaser at the time of enquiry and order.

Hot-rolling grades are normally supplied with an oxide scale layer unless they have been ordered pickled.

The product may be supplied lightly coated with temporary corrosion protection film by agreement between the manufacturer and the purchaser at the time of enquiry and order.

Coils supplied with trimmed edges and sheets shall not contain excessive burrs or cutting distortions which are prejudicial to the method of working of the product.

6.4 Surface condition

The surfaces shall be smooth and clean free from grease and rust [4]. Dispersed defects such as scratches, blisters, cracks, etc. are only permitted if they are within the limits of the tolerance on thickness and if they are not detrimental to the correct use of the supplied product.

[4] This should not be confused with some coloration of the insulating coating inherent to the manufacturing process.

In the case of a “TF” type product, supplied with an insulating coating, further care needs to be taken to avoid condensation on the edge, which can lead to an oxidation of these edges.

6.5 Suitability for cutting

The product shall be able to be cut or punched without causing premature wear of tools. The product shall be suitable for cutting or punching accurately into the usual shapes at any point when appropriate cutting or punching tools and technologies are used.

A special requirement concerning suitability for cutting or punching may be specified by agreement between the manufacturer and the purchaser at the time of enquiry and order.

6.6 Suitability for welding

A special requirement concerning suitability for welding of the product may be specified by agreement between the manufacturer and the purchaser at the time of enquiry and order.

7 Technical requirements

7.1 Mechanical properties

The specified values of minimum proof stress, $R_{p0,2}$, minimum tensile strength, R_m, and minimum percentage elongation after fracture, A, shall be as given in Table 1 and Table 2.

7.2 Magnetic properties

The specified values of minimum magnetic polarization at DC magnetic field strengths of 5 000 A/m and 15 000 A/m shall be as given in Table 1 and Table 2.

The values of peak magnetic polarization at AC magnetic field strengths of 5000 A/m and 15000 A/m (expressed as peak values) and at frequencies of 50 Hz may be used instead, provided the specified values of minimum magnetic polarization given in Table 1 and Table 2 are satisfied.