

Magnetic materials (iron and steel) for use in relays

The European Standard EN 10304:2001 has the status of a
British Standard

ICS 29.030

National foreword

This British Standard is the official English language version of EN 10304:2001. It supersedes BS 6404-8.10:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/NFE/5, Magnetic alloys and steels, which has the responsibility to:

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- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 June 2001

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English version

Magnetic materials (iron and steel) for use in relays

Matériaux magnétiques pour relais (fer et acier)

Magnetische Relaiswerkstoffe (Eisen und Stahl)

This European Standard was approved by CEN on 8 March 2001.

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

This Standard is based on IEC 60404-8-10.

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

1 Scope

This European Standard specifies the magnetic materials used principally for relays. In particular it specifies general requirements, the magnetic properties, geometric characteristics and tolerances.

This European Standard applies to pure iron and steel products generally delivered in the semi-processed state.

These materials correspond to clauses A, B, C1 and C2 of IEC 60404-1.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN 10029, *Hot rolled steel plates 3 mm thick and above - Tolerances on dimensions, shape and mass.*

EN 10051, *Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape.*

EN 10131, *Cold rolled uncoated low carbon and high yield strength steel flat products for cold forming - Tolerances on dimensions and shape.*

EN 10204, *Metallic products - Types of inspection documents.*

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

prEN 10058:2000, *Hot rolled flat for general purposes.*

prEN 10059:2000, *Hot rolled square for general purposes.*

prEN 10060:2000, *Hot rolled round for general purposes.*

IEC 60050 (221), *International Electrotechnical Vocabulary (IEV) - Chapter 221 : Magnetic materials and components.*

IEC 60404-7, *Magnetic materials - Part 7 : Method of measurement of the coercivity of magnetic materials in an open magnetic circuit.*

EN 20286-1, *ISO system of limits and fits - Part 1: Bases of tolerances, deviations and fits (ISO 286-1:1988)*

ISO 8457-1, *Steel wire rod : Part 1 : Dimensions and tolerances.*

3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in IEC 60050 (221) and the following apply.

3.1 sheet and plate

flat rolled product with a width of 600 mm or over

NOTE 1 The edges are as rolled, sheared or flame cut.

NOTE 2 A distinction is made between sheets which have a thickness up to 3 mm and plates which have a thickness of 3 mm or over.

3.2

strip

flat rolled product which immediately after the final rolling pass or after pickling or continuous annealing is wound into a regular coil

NOTE As rolled strip has slightly convex edges, but may also be supplied with sheared edges or slit from wider strip

3.3

flats

products of rectangular cross section rolled on the four faces of thickness generally 5 mm or greater and width not greater than 150 mm

3.4

rounds

products having a circular cross section of diameter generally 8 mm or greater

3.5

squares

products having a square cross section whose side is generally 8 mm or greater

3.6

wire rod

hot rolled long product having a nominal size generally of 5 mm or greater and wound into irregular coils

NOTE The cross section may be round, oval, square, rectangular, hexagonal, octagonal, half round or of any similar shape.

3.7

wire

product of constant full cross section along its length, obtained by cold drawing and which can be wound into irregular or regular coils

NOTE It is obtained by cold drawing wire rod through a reducing die or passing under pressure between rollers and rewinding the drawn product.

3.8

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

4 Classification

The materials covered by this standard are classified according to the maximum value of coercivity, the shape and dimensions of the material and its final condition. Not all materials are available in the cold rolled condition throughout the thickness range.

5 Designation

The conventional designation of the material comprises the following in the order given :

the letter M ;

the specified maximum value of coercivity in A/m ;

one of the following symbols :

F : for pure iron ;