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Magnetic materials -
Part 8-5: Specifications for individual materials - Electrical steel strip and sheet with specified mechanical properties and magnetic polarization

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Magnetic materials - Part 8-5: Specifications for individual materials - Electrical steel strip and sheet with specified properties and magnetic polarization

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60404-8-5 edition 2.1 contains the second edition (2020-08) [documents 68/648/CDV and 68/662/RVC] and its amendment 1 (2026-06) [documents 68/794/CDV and 68/804/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60404-8-5 has been prepared by IEC technical committee 68: Magnetic alloys and steels.

This second edition cancels and replaces the first edition published in 1989. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) extension of the range of products to include the improved grades;
b) division of "flatness" into "edge wave (wave factor)" and "residual curvature" in consistent with IEC 60404-9;
c) change length of test specimen for determinations of geometrical characters from 2 m to 1 m.

The text of this International Standard is based on the following documents:

CDV	Report on voting
68/648/CDV	68/662/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60404 series, published under the general title *Magnetic materials*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

The first edition of IEC 60404-8-5, "*Magnetic materials – Part 8: Specifications for individual materials – Section Five – Specification for steel sheet and strip with specified mechanical properties and magnetic permeability*", was published in April 1989 and has not been revised for more than 30 years. Since then, new grades of cold-rolled material of minimum proof strength $R_{p0,2}$ greater than 400 MPa were developed and widely used. Thus, IEC TC 68 decided in 2017 at their meeting in Paris to revise this document. This revision also includes corrections to the first edition in order to improve consistency with the other parts of the IEC 60404-8 subseries.

1 Scope

This part of IEC 60404 defines the grades of electrical steel strip and sheet with specified mechanical properties and magnetic polarization. In particular, it gives 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 intended 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.

They correspond to Class D21 of IEC 60404-1.

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.

IEC 60050-121, *International Electrotechnical Vocabulary – Part 121: Electromagnetism*

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

IEC 60404-1, *Magnetic materials – Part 1: Classification*

IEC 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*

IEC 60404-4, *Magnetic materials – Part 4: Methods of measurement of d.c. magnetic properties of iron and steel*

IEC 60404-9, *Magnetic materials – Part 9: Methods of determination of the geometrical characteristics of electrical steel strip and sheet*

ISO 404, *Steel and steel products – General technical delivery requirements*

ISO 2566-1, *Steel – Conversion of elongation values – Part 1: Carbon and low alloy steels*

ISO 6892-1, *Metallic materials – Tensile testing – Part 1: Method of test at room temperature*

ISO 10474, *Steel and steel products – Inspection documents*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-121, IEC 60050-221, IEC 60404-9 and the following apply.