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Magnetic materials -
Part 8-4: Specifications for individual materials - Cold-rolled non-oriented electrical steel strip and sheet delivered in the fully-processed state

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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

IEC 60404-8-4 edition 4.1 contains the fourth edition (2022-09) [documents 68/700/CDV and 68/713/RVC] and its amendment 1 (2026-06) [documents 68/793/CDV and 68/806/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.

IEC 60404-8-4 has been prepared by IEC technical committee 68: Magnetic alloys and steels. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2013. This edition constitutes a technical revision.

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

a) modification of terms and technical requirements concerning geometrical characteristics to be consistent with IEC 60404-9:2018;
b) insertion of Table 3 – Tolerances on nominal thickness;
c) change of the length of test specimen for determination of geometrical characteristics from 2 m to 1 m.

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

Draft	Report on voting
68/700/CDV	68/713/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

This revision of International Standard IEC 60404-8-4 has been prepared by the experts of the Working Group 1 of the IEC Technical Committee 68: Magnetic alloys and steels.

The third edition of IEC 60404-8-4 was issued in 2013. After that, other IEC 60404 standards were revised and IEC TC 68 decided in 2019 at their meeting in Düsseldorf to revise this document to maintain consistency for user's convenience. The revision is made mainly on technical amendments regarding testing and definitions of geometrical characteristics in accordance with IEC 60404-9. The length of test specimen for determination of geometrical characteristics is changed from 2 m to 1 m. The term of “flatness” is divided into “edge wave (wave factor)” and “residual curvature” and the horizontal method is introduced for verification of residual curvature. This revision also includes corrections in order to improve consistency with other standards of the IEC 60404-8 series.

1 Scope

This part of IEC 60404 defines the grades of cold-rolled non-oriented electrical steel strip and sheet in nominal thicknesses of 0,35 mm, 0,47 mm, 0,50 mm, 0,65 mm and 1,00 mm. In particular, it gives general requirements, magnetic properties, geometric characteristics, tolerances and technological characteristics, as well as inspection procedure. The nominal thickness 0,47 mm applies to the grades for use at 60 Hz only.

This document applies to cold-rolled non-oriented electrical steel strip and sheet supplied in the fully-processed state, i.e. the final annealed condition, in coils or sheets, and intended for the construction of magnetic circuits. This document does not apply to materials supplied in the semi-processed state.

NOTE The cold-rolled non-oriented electrical steel strip and sheet supplied in the semi-processed state is specified in IEC 60404-8-3.

The grades defined in this document correspond to Class C21 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 60404-3, *Magnetic materials – Part 3: Methods of measurement of the magnetic properties of electrical steel strip and sheet by means of a single sheet tester*

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

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

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

ISO 7799, *Metallic materials – Sheet and strip 3 mm thick or less – Reverse bend test*

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

Bibliography

IEC 60404-1-1, *Magnetic materials – Part 1-1: Classification – Surface insulations of electrical steel sheet, strip and laminations*

IEC 60404-8-3, *Magnetic materials – Part 8-3: Specifications for individual materials – Cold-rolled electrical non-alloyed and alloyed steel sheet and strip delivered in the semi-processed state*

IEC TR 63114, *Electrical steel – Reverse bend test method of electrical steel strip and sheet*

ASTM A34/A34M, *Standard Practice for Sampling and Procurement Testing of Magnetic Materials*

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