

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Magnetic materials –

**Part 8-1: Specifications for individual materials – Permanent magnet
(magnetically hard) materials**

Matériaux magnétiques –

**Partie 8-1: Spécifications pour matériaux particuliers – Matériaux (magnétiques
durs) pour aimants permanents**



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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 Types of materials and their applications.....	9
5 Classification.....	9
5.1 General.....	9
5.2 Principal magnetic properties.....	10
5.3 Additional magnetic properties.....	10
6 Chemical composition.....	11
7 Densities	11
8 Designation	11
9 Mode of shipment and dimensions.....	11
10 Testing.....	12
10.1 Extent of testing.....	12
10.2 Testing methods.....	12
11 Grounds for rejection.....	12
12 Description of tables of standard properties.....	12
12.1 Magnetically hard alloys.....	12
12.1.1 Aluminium-nickel-cobalt-iron-titanium alloys (AlNiCo).....	12
12.1.2 Chromium-iron-cobalt alloys (CrFeCo).....	13
12.1.3 Iron-cobalt-vanadium-chromium alloys (FeCoVCr).....	14
12.1.4 Rare earth-cobalt alloys (RECo).....	14
12.1.5 Rare earth-iron-boron sintered and hot deformed magnets (REFeB).....	15
12.2 Magnetically hard ceramics (magnetically hard ferrites).....	16
12.2.1 Chemical composition.....	16
12.2.2 Manufacturing method.....	17
12.2.3 Sub-classification.....	17
12.2.4 Magnetic properties and densities.....	17
12.2.5 Dimensional tolerances.....	17
12.3 Bonded magnetically hard materials (Bonded magnets).....	17
12.3.1 General.....	17
12.3.2 Magnet materials.....	17
12.3.3 Manufacturing method.....	18
12.3.4 Sub-classification.....	18
12.3.5 Magnetic properties and densities.....	20
12.3.6 Dimensional tolerances.....	20
13 Irreversible demagnetization behaviour.....	20
13.1 General.....	20
13.2 General definition of demagnetization field strength H_D	20
13.3 Simplified definition of demagnetization field strength H_D	21
14 Tables 10 to 25.....	23

Annex A (informative) Physical data and mechanical reference values of AlNiCo, CrFeCo, FeCoVCr, SmCo, NdFeB, hard ferrite and SmFeN bonded magnets	43
Annex B (informative) Grain boundary diffusion (GBD) process for REFeB sintered magnets.....	45
Annex C (informative) Cerium-iron-boron sintered magnets (CeFeB)	46
Bibliography.....	47
Figure 1 – Graphic representation of $B(H)$ and $J(H)$ demagnetization and recoil curves	21
Figure 2 – Simplified evaluation of $B(H)$ and $J(H)$ demagnetization and recoil curves	23
Figure B.1 – Example of coercivity gain of GBD processed sintered REFeB magnets in dependence of the distance to the magnet surface	45
Figure C.1 – Manufacturing flow chart of CeFeB sintered magnets	46
Table 1 – Classification of permanent magnet (magnetically hard) materials.....	9
Table 2 – Magnetic properties – Symbols and units.....	10
Table 3 – Additional magnetic properties – Symbols and units.....	10
Table 4 – Chemical compositions of AlNiCo alloys (% mass fraction) – for information purposes only	12
Table 5 – Chemical compositions of CrFeCo alloys (% mass fraction) – for information purposes only	13
Table 6 – Chemical compositions of FeCoVCr alloys (% mass fraction) – for information purposes only	14
Table 7 – Chemical compositions of RECo alloys (% mass fraction) – for information purposes only	15
Table 8 – Chemical compositions of REFeB sintered and hot deformed magnets (% mass fraction) – for information purposes only	16
Table 9 – Chemical compositions of REFeB alloys for bonded magnet (% mass fraction) – for information purposes only	18
Table 10 – Magnetic properties and densities of AlNiCo magnets	24
Table 11 – Magnetic properties and densities of CrFeCo and FeCoVCr magnets	25
Table 12 – Magnetic properties and densities of RECo sintered magnets.....	26
Table 13 – Magnetic properties and densities of REFeB sintered magnets.....	28
Table 14 – Magnetic properties and densities of REFeB hot deformed magnets.....	30
Table 15 – Magnetic properties and densities of hard ferrites.....	31
Table 16 – Magnetic properties and densities of isotropic AlNiCo bonded magnets.....	33
Table 17 – Magnetic properties and densities of isotropic and anisotropic RECo bonded magnets	34
Table 18 – Magnetic properties and densities of isotropic REFeB bonded magnets.....	35
Table 19 – Magnetic properties and densities of anisotropic REFeB bonded magnets.....	37
Table 20 – Magnetic properties and densities of isotropic and anisotropic hard ferrite bonded magnets	38
Table 21 – Magnetic properties and densities of isotropic and anisotropic REFeN bonded magnets	39
Table 22 – Dimensional tolerances (as cast or as sintered) of AlNiCo magnets.....	40
Table 23 – Dimensional tolerances of cold rolled strips of FeCoVCr and CrFeCo magnets with a maximum thickness of 6 mm and maximum width of 125 mm.....	40

Table 24 – Dimensional tolerances of the diameter of cold drawn wires and bars of FeCoVCr and CrFeCo magnets.....41

Table 25 – Dimensional tolerances on hard ferrites.....42

Table A.1 – Physical data and mechanical reference values of AlNiCo, CrFeCo, FeCoVCr, SmCo, NdFeB, hard ferrite and SmFeN bonded magnets44

Table C.1 – Chemical compositions of CeFeB sintered magnets (% mass fraction).....46

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MAGNETIC MATERIALS –

**Part 8-1: Specifications for individual materials –
Permanent magnet (magnetically hard) materials**

FOREWORD

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IEC 60404-8-1 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 2015. This edition constitutes a technical revision.

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

- a) recently developed anisotropic REFeB hot deformed magnets and anisotropic HDDR REFeB bonded magnets are included;
- b) high energy Ca-La-Co ferrites stabilized by La and Co substitution are included;
- c) new and high-performance grades of REFeB and RE₂Co₁₇ sintered magnets and isotropic REFeN bonded magnets are added.

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

Draft	Report on voting
68/732/CDV	68/742/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 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 document includes the recently developed REFeB hot deformed magnets, anisotropic HDDR REFeB bonded magnets and high energy Ca-La-Co ferrites which have become established in permanent magnet applications. New and high-performance materials of REFeB and RE_2Co_{17} sintered magnets and isotropic and anisotropic REFeN bonded magnets are added to each table with new codes. Almost all materials added to this document have been used for various motors to save energy and contribute to the prevention of global warming.

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MAGNETIC MATERIALS –

Part 8-1: Specifications for individual materials – Permanent magnet (magnetically hard) materials

1 Scope

This part of IEC 60404 specifies minimum values for the principal magnetic properties of, and dimensional tolerances for, technically important permanent magnet (magnetically hard) materials.

For information purposes only, this document provides values for the densities of the materials and the ranges of their chemical compositions.

NOTE Some additional physical data and mechanical reference values concerning the magnetic materials are given in Table A.1 for information and comparison purposes.

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 (IEV) - Part 121: Electromagnetism*

IEC 60050-151, *International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices*

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

IEC 60404-5:2015, *Magnetic materials - Part 5: Permanent magnet (magnetically hard) materials - Methods of measurement of magnetic properties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-121, IEC 60050-151 and IEC 60050-221 apply.

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