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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Replacing GB/T 21219-2007

**Magnetic materials - Classification
(English Translation)**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document replaces GB/T 21219-2007 "Classification of Magnetic Materials":
Compared with GB/T 21219-2007, except for structural adjustment and compilation in addition to editorial changes, the main technical changes are as follows:

- a) Deleted the property values specified for materials in all categories and only pointed out

that the properties of materials are specified in the corresponding product specifications (see:2007

Table 2~Table 15, Table 17~Table 49 of the annual edition);

b) Changed the range of nickel content in E1 and E3 materials (see 4.5:1, 4:5:3, 2:5:1, 2:5:3 of the:2007 edition);

c) Changed the range of cobalt content in F3 materials (see 4.6:3, 2:6:3 of the:2007 edition);

d) Added category U5 - bonded rare earth iron nitrogen materials (see 5.5:6):

This document is modified to adopt IEC 60404-1:2016 "Magnetic Materials Part 1: Classification":

Compared with IEC 60404-1:2016, this document has made the following structural adjustments:

---Delete the section number 4:4:2:1, merge the title into 4:2:2, and subsequently adjust 4:4:2:1:1~4:4:2:1:6 to 4:4:2:1~4:4:2:6:

Compared with IEC 60404-1:2016, this document has many technical differences: A list of these technical differences and their causes is shown in Appendix A:

The following editorial changes have been made to this document:

---In order to coordinate with my country's standards, the name of the standard was changed to "Classification of Magnetic Materials";

---Added Appendix A (informative):

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document is suitable for classifying commercially available magnetic materials: The term "magnetic material" refers to applications requiring ferromagnetic or ferrimagnetic properties substance:

In this document, the classification of magnetic materials is based on the two main recognized product categories:

---Soft magnetic materials (coercive force $\leq 1000\text{A/m}$);

---Permanent (hard) magnetic materials (coercivity $>1000\text{A/m}$):

Within these main categories, when properly classified, the following characteristics can be discerned:

---The main alloying elements, metallurgical state and physical properties of the material;

--- Where possible and convenient, the interrelationships between these characteristics can also be identified:

Classification according to specific application areas cannot be applied to all materials, since different materials can often be used in the same application, depending on the properties required by the application:

the use of:

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document:

GB/T 2521.1-2016 Full-process cold-rolled electrical steel Part 1: Grain-non-oriented steel strip (sheet) (IEC 60404-8-4:

2013,MOD)

GB/T 2521.2-2016 Full-process cold-rolled electrical steel Part 2: Grain-oriented steel strip (sheet) (IEC 60404-8-7:2008, MOD) GB/T 2900.60-2002 Electrical terminology electromagnetism (eqvIEC 60050-121:1998) GB/T 2900.83-2008 Electrical terminology Electrical and magnetic devices (IEC 60050-151:2001, IDT) GB/T 3655-2022 Method for measuring the magnetic properties of electrical steel strips (sheets) using Epstein square circles (IEC 60404-2:1996, MOD) GB/T 3658-2022 Ring specimens for magnetic properties of soft magnetic metal materials and powder metallurgical materials in the frequency range of 20Hz~100kHz Measurement method (IEC 60404-6:2018, MOD) GB/T 9637-2001 Electrical terminology Magnetic materials and components (eqvIEC 60050-221:1990) GB/T 10129-2019 Measuring method for medium frequency magnetic properties of electrical steel strips (sheets) (IEC 60404-10:2016, MOD) GB/T 13012-2008 Method for measuring DC magnetic properties of soft magnetic materials (IEC 60404-4:2000, IDT) GB/T 13304.1-2008 Steel Classification Part 1: Classification by Chemical Composition (ISO 4948-1:1982, MOD) GB/T 13789-2022 Method for measuring the magnetic properties of electrical steel strips (sheets) using a single-chip tester (IEC 60404-3:1992, MOD) GB/T 13888-2009 Method for measuring coercive force of magnetic materials in open magnetic circuit (IEC 60404-7:1982, IDT) GB/T 17951-2022 General technical conditions for hard magnetic materials (IEC 60404-8-1:2015, MOD) GB/T 17951.2-2014 Semi-process cold-rolled non-oriented electrical steel strip (IEC 60404-8-3:2005, MOD) GB/T 21220-2007 Soft magnetic metal materials (IEC 60404-8-6:1999, IDT) GB/T 24296-2009 Technical conditions for sintered soft magnetic materials (IEC 60404-8-9:1994, IDT) GB/T

43344-2023 Specification for magnetic materials (iron and steel) for relays (IEC 60404-8-10:2009, IDT)