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

GB/T 13789-2022

Replacing GB/T 13789-2008

**Methods of measurement of the magnetic properties of
electrical steel strip and sheet by means of a single sheet tester**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document replaces GB/T 13789-2008 "Method for Measuring Magnetic Properties of Electrical Steel Sheets (Strips) with Single Chip Tester", and GB/T 13789-

Compared with.2008, except for structural adjustment and editorial changes, the main technical changes are as follows.

- a) Changed Figure 1 and added a schematic diagram of a C-shaped yoke (see Figure 1, Figure 1 of the.2008 edition);
- b) Method A (current method) has been changed (see Chapter 4, Chapter 4 and Chapter 5 of the.2008 edition);
- c) Changed the reproducibility requirements for peak magnetic polarization and magnetic field intensity (see 4.7.6, 5.3 of the.2008 edition);
- d) Add method B (magnetic field coil method) (see Chapter 5);
- e) Increase the selection of methods in the test report (see Chapter 6);
- f) Some requirements for the manufacture of the yoke have been changed, and the typical value of the proportion of the yoke loss to the total loss of the sample has been added (see Appendix C,

Appendix A of the.2008 edition).

This document is modified to adopt IEC 60404-3.1992 "Magnetic materials Part 3.Measuring the magnetic properties of electrical steel strip (sheet) by single-chip tester Methods".

Compared with IEC 60404-3.1992, this document has more structural adjustments. Comparison overview of structure number changes between two files

See Appendix A for the table.

Compared with IEC 60404-3.1992, this document has many technical differences, and vertical

Straight line (|) is marked. See Appendix B for a list of these technical differences and their causes.

The following editorial changes have been made to this document.

--- In order to coordinate with the current standard, change the name of the standard to

"Method for Measuring Magnetic Properties of Electrical Steel Strip (Sheet) with Single Chip Tester";

---Incorporated the content of IEC 60404-3.1992/AMD.1.2002 AMD.2.2009 and COR.1.2009, in the involved

The position of the outer margin of the clause is marked with a vertical double line (||);

---Replace the international documents for informative references with Chinese standards;

--- Due to the addition of method B, the current method is changed to method A;

--- Modify and add the notes in 4.6 and 6.3.3;

--- Deleted the calibration of the single-chip method relative to the Epstein method in Appendix B (informative) of IEC 60404-3.1992;

--- Adjust Appendix C (informative) of IEC 60404-3.1992 to Appendix D;

--- Adjusted Appendix D (informative) of IEC 60404-3.1992 to Appendix E, and added peak magnetic field strength and specific apparent power

The calculation formula;

--- Increased the confirmation and calibration scheme of Appendix F (informative) magnetic measuring equipment;

--- Added Appendix G (informative) digital method to control the sine of the magnetic polarization waveform.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document specifies the general rules and technical details for measuring the magnetic properties of electrical steel strip (sheet) with a single-chip tester, including methods A (current method) and

Method B (Field Coil Method).

This document is applicable to.

a) Grain oriented electrical steel strip (sheet)

1) Measured at the peak of 1.0T~1.8T magnetic polarization.

--- Specific total loss;

--- Specific apparent power;

--- Effective value of magnetic field strength.

2) Measured at the peak value of the magnetic field strength not higher than 1000A/m.

--- The peak value of the magnetic polarization;

--- The peak value of the magnetic field strength.

b) Grain-free oriented electrical steel strip (sheet)

1) Measured at the peak of the magnetic polarization of 0.8T~1.5T.

--- Specific total loss;

--- Specific apparent power;

--- RMS value of excitation current.

2) Measured at the peak value of the magnetic field strength not higher than 10000A/m.

--- The peak value of the magnetic polarization;

--- The peak value of the magnetic field strength.

The single-chip tester specified in this document is suitable for measuring samples made of various types of electrical steel strips (sheets), and is suitable for use in specified magnetic polarization.

Magnetic properties were measured in a state where the intensity peak value, frequency, and induced voltage were sinusoidal waveforms.

The measurement is carried out at an ambient temperature of 23°C+/-5°C, and the sample should be demagnetized before the test.

Note 1.The "magnetic polarization" used in this document is defined in GB/T 9637.In some standards related to electrical steel, there is a use of "magnetic flux density"

and the case of "magnetic induction". Under normal measurement conditions, the difference in magnitude between the above-mentioned differently defined physical quantities can be ignored.

Note 2.The magnetic field strength measurement of method A (current method) is based on the conventional magnetic path length, and the measurement is relative; the magnetic field strength measurement of method B (magnetic field coil method) is

Direct; there is a certain difference in the results measured by the two methods.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document;