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GB/T 10129-2019

Methods of measurement of magnetic properties of electrical steel strip and sheet at medium frequencies

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 10129-1988 "Electrical steel sheet (band) intermediate frequency magnetic performance measurement method". And GB/T 10129-1988

The main changes are as follows.

--- Added digital sampling and data processing methods;

---Modified the content of air flux compensation under high frequency conditions, and replacing the capacitive coupling of the mutual inductance with digital compensation;

--- Removed standard samples and instrumentation verification;

--- Added test report;

--- Revised Chapter 2 of the 1988 edition as Appendix A of this standard;

--- Added Appendix B "Epstein Square Circle for IF Measurement";

--- Added Appendix C "Digital Sampling Method for Magnetic Performance Measurement".

This standard uses the redrafting method to modify the use of IEC 60404-10.2016 "magnetic materials part 10. electrical steel strip (sheet) medium frequency magnetic

Performance Measurement Method.

This standard has a slight adjustment in structure compared to IEC 60404-10.2016, adjusted as follows.

--- Appendix B of this standard corresponds to Appendix A of IEC 60404-10.2016;

--- Appendix C of this standard corresponds to Appendix B of IEC 60404-10.2016.

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This standard is compared with IEC 60404-10.2016 "Magnetic materials part 10. Electrical steel strip (sheet) medium frequency magnetic properties measurement method"

In the case of technical differences, the terms involved in these differences have been marked by a vertical single line (|) in the outer margin of the margin, Appendix D

A list of the corresponding technical differences and their causes is given.

This standard has made the following editorial changes.

--- Modified the standard name;

---Modified the winding diameter of the winding coil of Appendix B is 0.35mm;

-- (B.1) added a restrictive expression;

--- Fixed an error in equation (C.2).

This standard was proposed by the China Iron and Steel Association.

This standard is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

This standard was drafted. Baoshan Iron and Steel Co., Ltd., Changsha Tianheng Measurement and Control Technology Co., Ltd., Metallurgical Industry Information Standards Institute.

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1 Scope

This standard specifies the general principle, specific loss, and magnetic polarization of the intermediate frequency AC magnetic properties of electrical steel strips (sheets) measured by Epstein squares.

Degree peak, magnetic field strength RMS, magnetic field strength peak and specific apparent power measurement method, measuring device, measurement procedure and test report.

This standard applies to alternating current magnetic measurements of grain orientation and grain non-oriented electrical steel strips (sheets) in the frequency range of 400 Hz to 10 kHz.

Amount, suitable for test specimens taken from any grade of electrical steel strip (sheet).

The sample was demagnetized before measurement and the measurement was carried out at ambient temperature (23 +/- 5) °C.

Note. The definition of "magnetic polarization" in this standard refers to GB/T 9637, and some standards of the electrical steel series use the definition of "magnetic flux density".

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2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2521.1 Full-process cold-rolled electrical steel - Part 1. Grain-oriented steel strips (sheets) (GB/T 2521.1-2016,

IEC 60404-8-4.2013, MOD)

GB/T 2521.2 Whole Process Cold Rolled Electrical Steel Part 2. Grain Oriented Steel Strips (Sheets) (GB/T 2521.2-2016,

IEC 60404-8-7.2008, MOD)

GB/T 2900.60 Electrotechnical terminology electromagnetics [GB/T 2900.60-2002, eqvIEC 60050 (121)..1998]

GB/T 3658 soft magnetic material AC magnetic properties ring sample measurement method (GB/T 3658-2008, IEC 60404-6.2003,

MOD)

GB/T 9637 Electrotechnical terminology standard magnetic materials and components [GB/T 9637-2001, eqvIEC 60050 (221)..1990]

GB/T 19289 Method for measuring the density, resistivity and stacking factor of electrical steel sheets (belts) (GB/T 19289-2003,

IEC 60404-13.1995, MOD)

3 Terms and definitions

The terms and definitions defined in GB/T 2900.60 and GB/T 9637 apply to this document.

4.1 General

This chapter specifies the general conditions for measuring the intermediate frequency AC magnetic properties of electrical steel strips (sheets) using a 25 cm Epstein square. Measuring with a ring sample

See Appendix A for the IF AC magnetic properties of electrical steel strips (sheets).

4.2 Principle of 25cm Epstein's Square Circle Method

The 25cm Epstein square consists of a primary coil, a secondary coil and a sample to be

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tested as a core. It forms a no-load transformer

The AC characteristics are measured according to the method described in 4.3~4.10.

At the high end of the frequency range of this standard, a special structure of the Epstein square is required (see Appendix B). Coupling between windings

The capacitance should be low enough that the effect of the capacitive impedance on the loss result is negligible; and the frame material supporting the coil should also have a low

Dielectric loss.

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