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Calibration Specification for DC Magnetic Properties Measuring Instruments for Magnetically Soft Materials

软磁材料直流磁特性测量仪校准规范

(English Translation)

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Introduction

JJF 1001-2011 "General Metrology Terms and Definitions", JJF 1059.1-2012 "Measuring Uncertainty Evaluation and Representation" and JJF 1071-2010 "Rules for the Compilation of National Metrology and Calibration Specifications" together constitute the foundation supporting this specification Series specifications.

This specification refers to JJG317 "Trial Verification Regulations for Magnetic Flux Meters" and JJG354 "Trial Standard Samples of Soft Magnetic Materials" Verification Regulations, JJG407 Trial Verification Regulations for Pure Iron Standard Samples for Electrical Engineering, JJF 1013 Common Names for Magnetic Metrology Terms and Definitions (Trial)", JJF 1094 "Characteristic Evaluation of Measuring Instruments", JJF 1587-2016 "Digital Multipurpose

Table Calibration Specification" and GB/T 13012-2008 "Measurement Method of DC Magnetic Properties of Soft Magnetic Materials".

This specification is released for the first time.

Calibration specification for DC magnetic property measuring instrument for soft magnetic materials

1 Scope

This specification is applicable to the calibration of DC magnetic characteristic measuring instruments for soft magnetic materials using the ring sample method or the A-type permeance method (hereinafter referred to as the permeameter method).

The upper limit of the magnetic field strength of the ring sample method is 10kA/m; the magnetic field strength range of the magnetometer method is (1~200)kA/m.

2 Reference documents this specification refers to the following documents.

JJG317 Flux Meter Trial Verification Regulation JJG354 Trial Verification Regulations for Standard Samples of Soft Magnetic Materials JJG407 Electrician pure iron standard sample trial verification regulation JJF 1013 Commonly Used Terms and Definitions in Magnetic Metrology (Trial) JJF 1094 Evaluation of Characteristics of Measuring Instruments JJF 1587-2016 Calibration Specification for Digital Multimeter GB/T 13012-2008 Measurement method for DC magnetic properties of soft magnetic materials for dated reference documents, only the dated version applies to this specification; for undated reference documents, the latest version (including all amendments) is applicable to this specification.

3 Terms and units of measurement

3.1 Magnetic field inhomogeneity of magnetometer the absolute value of the relative deviation between the magnetic field intensity in a certain area near the center of the

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magnetometer solenoid and the magnetic field intensity at the center.

4 overview

The DC magnetic characteristic measuring instrument for soft magnetic materials adopts the ring sample method or the permeability meter method to measure the DC magnetic characteristics of soft magnetic materials.

Dedicated instrument for performance parameters. For the ring sample method, the magnetic field strength is obtained by measuring the primary current, which is mainly suitable for magnetic Measurement of field strength below 10kA/m. For the permeance method, the magnetic the field detection system measures the magnetic field strength and is used to measure the magnetic field strength in the range of (1~200) kA/m.

The basic principle of the DC magnetic characteristic measuring instrument for soft magnetic materials with ring sample method is shown in Figure 1.Its magnetization device includes straight Current source, current measuring device and primary winding. The sample is magnetized by the primary winding and measured by the current measuring device Measure the primary current, calculate the magnetic field strength, and measure the magnetic flux density of the sample through a flux meter connected to the secondary winding. Advance and get the saturation magnetic flux density, remanence, coercivity, initial permeability and maximum permeability.

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