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

GB/T 38437-2019

**Methods of measurement of the magnetic dipole moment of a
ferromagnetic material specimen by the withdrawal or rotation
method**

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Foreword

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

This standard uses the redrafting method to modify and adopt IEC 60404-14..2002 "Magnetic materials-Part 14. Measured by drawing or rotating

Method for measuring the magnetic dipole moment of ferromagnetic material samples.

Compared with IEC 60404-14..2002, this standard has a few structural adjustments. Appendix A lists this standard and IEC 60404-14.

List of.2002 chapter number comparisons.

The technical differences between this standard and IEC 60404-14..2002 and their causes are as follows.

--- Regarding normative references, this standard has made adjustments with technical differences to suit China's technical conditions and the situation of adjustment.

The situation is reflected in Chapter 2 "Regulatory Reference Documents", and the specific adjustments are as follows.

- * Replace IEC 60050-121 with GB/T 2900.60-2002 equivalent to the international standard;
- * Replace IEC 60050 (221) with GB/T 9637-2001 equivalent to the international standard;
- * Use JJF1059.1 instead of ISO /IEC Guide 98-3..2008.

--- In order to adapt to China's national conditions, Figure 1 is simplified, the standard mutual inductance calibration part in Figure 1 is removed, and Figure 1 is moved to the basic measurement principle.

(See Chapter 4), added notes on anti-jamming measures.

--- In order to adapt to China's national conditions, a note on the effect of test temperature on measurement has been added.

--- In order to adapt to China's national conditions, the content of calibrating the magnetic flux integrator with standard mutual inductance has been deleted, and the volt-second calibration has been added (see section

Chapter 7).

The following editorial changes have been made to this standard.

--- Renamed the standard name to "Method for measuring the magnetic dipole moment of ferromagnetic material samples by drawing or rotating";

--- In Chapter 2, IEC 60404-5, IEC 60404-4 and IEC 60404-7, because they are not normatively cited in the text, they are moved to the reference

literature;

--- Added notes in Chapters 4 and 5;

--- Added the expressions mentioned in Appendix B, Appendix C and Appendix D in Chapter 11.

This standard was proposed by the China Electrical Equipment Industry Association.

This standard is under the jurisdiction of the National Electrotechnical Alloy Standardization Technical Committee (SAC/TC228).

This standard was drafted. China Academy of Metrology, Guilin Electric Appliance Research Institute Co., Ltd., Ningbo Institute of Metrology and Testing, Dongguan

Haitian Magnetic Industry Co., Ltd., Henan University of Science and Technology, Tianjin Sanhuan Lexi New Material Co., Ltd., China Jiliang University, Inner Mongolia Autonomous Region

Rare Earth Product Quality Inspection Research Institute, Zhejiang Xinsheng Permanent Magnet Technology Co., Ltd., Fujian Changting Zhuoer Technology Co., Ltd., Guangdong Industry

Industry Analysis and Testing Center, Zhejiang Zhonghang New Material Technology Co., Ltd., Jiangsu Ruxin Intelligent Technology Co., Ltd., Xiamen Kunjin Electronic Technology Co., Ltd.

Company, Xi'an Nuofang Information Technology Co., Ltd., Zhejiang Fengmao Information Technology Co., Ltd., Xi'an Xumai Intelligent Appliance Technology Co., Ltd., Xiamen

Keli Electronics Co., Ltd., Xiamen Wanming Electronics Co., Ltd., Xi'an Kaijinzhe Testing Co., Ltd.

1 Scope

This standard specifies the basic method for measuring the magnetic dipole moment of a

ferromagnetic material sample with a detection coil under an open magnetic circuit.

Measurement of magnetic dipole moment

The amount can be pulled or rotated.

This standard applies to all ferromagnetic materials, especially for the measurement of the magnetic dipole moment of permanent magnetic (hard magnetic) materials and containing ferromagnetic binders.

Measurement of Specific Saturation Magnetic Polarization of Cemented Carbide Materials.

In addition, the sample is magnetized to saturation by a certain method, and the saturation magnetic dipole moment of the sample can also be determined. Flat magnetic polarization

The average value can be calculated by measuring its magnetic dipole moment and the volume of the sample. Calibration of magnetic moment coil system and measurement of magnetic dipole moment of weak magnetic material

The amount can also be used in this method.

Remanence, coercive force, maximum magnetic energy product and other parameters can be measured in a closed magnetic circuit according to the methods described in GB/T 13012 and GB/T 3217

measuring. The intrinsic coercivity H_{cJ} of soft magnetic and semi-hard magnetic materials can be measured under the open magnetic circuit according to the method described in GB/T 13888.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article

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

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

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

JJF1059.1 Evaluation and Expression of Measurement Uncertainty [ISO /IEC Guide98-3..2008, NEQ]

IEC 60050 (151) International Electrotechnical Terminology Part 151. Electromagnetic Devices [Internationalelectrotechnical

vocabulary (IEV) -Part 151. Electricalandmagneticdevices]

3 terms and definitions

The terms and definitions defined in GB/T 2900.60-2002, GB/T 9637-2001 and IEC 60050 (151) apply to this document.

4 Basic principles of measurement

A calibrated detection coil is connected to a calibrated magnetic flux integrator, which forms the basis of the magnetic dipole moment of the ferromagnetic material sample.

Measuring device (see Figure 1). Unless a coil shield (see note to 8.3) or a magnetic field generated by a permanent magnetization system is used to magnetize the specimen (see (Chapter 9), otherwise ferromagnetic materials should be avoided near the detection coil.

Note 1. The interference of electromagnetic signals should be minimized around the detection coil, such as the signals brought by mobile phones, wireless routers, etc. If electromagnetic interference is significant, and

Can eliminate interference signal sources, consider placing the coil plane perpendicular to the horizontal plane to reduce interference.