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

GB/T 12966-2022

Replacing GB/T 12966-2008

**The methods for determining aluminium and aluminium alloys
conductivity using eddy current**

铝及铝合金电导率涡流测试方法

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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 of Standardization Documents" drafted. This document replaces GB/T 12966-2008 "Eddy Current Test Method for Electrical Conductivity of Aluminum Alloys". In addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) changed the scope (see Chapter 1, Chapter 1 of the.2008 edition);
- b) Deleted "Eddy Current", "Effective Penetration Depth", "Standard Penetration Depth", "lift-off effect", "edge effect", "instrument sensitivity" and "instrument stability". "Qualitative", "lift-off inhibition", "direct test", "correction test", "correction coefficient" terms (see Chapter 3, Chapter 3 of the.2008 edition);
- c) Changed the test range of the eddy current conductivity meter (see 4.3.1.2, 5.2.2 of the.2008 edition);
- d) Increased the stability of the conductivity meter running for 30min (see 4.3.1.4);
- e) Added standard test block (see 4.3.2);
- f) Added the minimum test thickness for the calculation formula of eddy current standard penetration depth and typical conductivity value (see 4.4.1.5);
- g) Added non-contact test method (see Chapter 5);
- h) Added period verification (see Appendix A);
- i) Added the test method for narrow material (see Appendix B);
- j) The specimens for surface correction test are added (see C.1);
- k) Added SigmatestD

1 Scope

GB/T 12966-2022 is the Chinese national standard on the methods for determining aluminium and aluminium alloys conductivity using eddy current, in the field of testing. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 9 March 2022 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2022. Classification: ICS 19.100, CCS H20. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies a method for the determination of the electrical conductivity of aluminium and its aluminium alloys by contact or non-contact. This document applies to the eddy current test of the electrical conductivity of aluminum and aluminum alloy materials.

2 Normative references

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

GB/T 12604.6 Nondestructive Testing Terminology Eddy Current Testing

JJF1516 Non-ferromagnetic metal conductivity sample (standard) calibration specification

3 Terms and Definitions

GB/T 12604.6 as well as the following terms and definitions apply to this document.

3.1 Measurement accuracy The difference between the measured value obtained by the eddy current conductivity meter testing the conductivity standard test block and the conductivity value of the standard test block under the given conditions.

4 Contact test method

4.1 Principle When a coil carrying an alternating current of a certain frequency and amplitude approaches the surface of the conductor, the alternating magnetic field generated by the alternating current in the coil is in the conductor. Eddy currents are induced on the surface and near the surface, and the magnetic field of the eddy current reacts to the coil. conductivity is related. According to this principle, the eddy current

conductivity meter can be calibrated with a standard test block with known conductivity value, and the true conductivity value of the sample can be directly measured. When the size, shape or surface state of the sample causes the measured value of conductivity to deviate greatly from the actual value, after the user agrees, the sample stacking can be used. The relationship between the actual value of the conductivity and the test value can be obtained by comparing the plane with the curved surface or removing the surface state, so as to analyze the measured data of the conductivity. Compensation is performed, and the test result after compensation is used as the true value of conductivity.

4.2 Test Conditions

4.2.1 The test site should be a non-corrosive environment, avoiding direct sunlight and no electromagnetic field interference.

4.2.2 The temperature of the test environment should not fluctuate greatly.

4.2.3 The testers should have the basic knowledge of eddy current, be familiar with special technical documents, have practical operation training and pass the internal evaluation of the enterprise. Available for work.