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PEOPLE'S REPUBLIC OF CHINA

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**GB/T 2522-2017**

Replacing GB/T 2522-2007

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**Methods of Test for the Determination  
of Coating Insulation Resistance and  
Coating Adhesion of Electrical Strip and Sheet**

(IEC 60404-11:2012, Magnetic Materials - Part 11: Method of Test for the  
Determination of Surface Insulation Resistance of Magnetic Sheet and Strip, NEQ)

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## Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 2522-2007 *Methods of Test for the Determination of Surface Insulation Resistance and Lamination Factor of Electric Sheet and Strip*; compared with GB/T 2522-2007, this Standard has the major changes as follows:

- Change the standard name from *Methods of Test for the Determination of Surface Insulation Resistance and Lamination Factor of Electric Sheet and Strip* to *Methods of Test for the Determination of Coating Insulation Resistance and Coating Adhesion of Electrical Strip and Sheet*;
- Modify the test circuit diagram of coating insulation resistance;
- Delete the test method B of coating insulation resistance;
- Add test method with total area of 10 contacts of 1000mm<sup>2</sup>;
- Modify the provisions of the total current of 10 contacts;
- Add the calculation of interlayer resistance coefficient;
- Add the repeatability and reproducibility requirements for the coating insulation resistance test;
- Add the coating adhesion levels.

This Standard was prepared by using re-drafting law and with reference of IEC 60404-11:2012 *Magnetic Materials – Part 11: Method of Test for the Determination of Surface Insulation Resistance of Magnetic Sheet and Strip*; the consistency with IEC 60404-11:2012 is not equivalent.

This Standard was proposed by China Iron and Steel Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel (SAC/TC 183).

Drafting organizations of this Standard: Wuhan Iron and Steel Company Limited, Baoshan Iron & Steel Co., Ltd., Shougang Corporation, and China Metallurgical Information and Standardization Institute.

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# Methods of Test for the Determination of Coating Insulation Resistance and Coating Adhesion of Electrical Strip and Sheet

## 1 Scope

This Standard specifies the test methods for the determination of coating insulation resistance and coating adhesion of electrical strip and sheet.

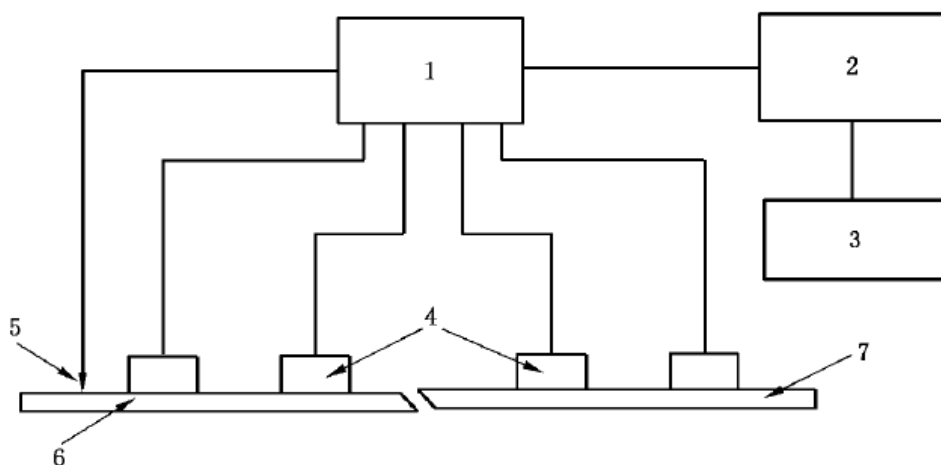
This Standard is applicable to the surface insulation resistance and interlayer resistance test of non-oriented and oriented electrical steel strip and sheet; and the insulation coating adhesion test of non-oriented and oriented electrical steel strip and sheet.

## 2 Coating Insulation Resistance Test

### 2.1 Measurement principle

Franklin Method that can only perform single coating measurement shall be adopted.

The device circuit schematic diagram is shown in Figure 1. Under the specified voltage and pressure, press 10 fixed-area metal contacts against a coating surface of the steel plate. Evaluate the effectiveness of surface insulation coating by measuring the current through 10 contacts.



Key:

Take  $\pm 5\%$  or less test method determining the uncertainty to test the total force exerted by all contacts on the specimen under test.

## 2.4 Device confirmation

The confirmation of the device is suitable to take the following three types:

- a) Under the rated test pressure, apply the contacts and the drilling bit to a clean copper plate; the total current through the 10 contacts shall be  $1.0 \times (1 \pm 3\%)A$ ; if the actual situation doesn't match, check the cleanliness of the contacts, the sharpness of the drilling bit and the contact resistance.
- b) Under the rated test pressure, pressure the carbon paper onto the white paper through the contacts; at this time, even indentation occurs instead of the sign of force concentration. Replace the carbon paper and white paper by a force measurement board that exerts pressure and is displayed by changing the color density.
- c) Successively connect the  $0.1\Omega$ ,  $1\Omega$ ,  $10\Omega$  and  $100\Omega$  standard resistances in between the drilling bit and contact pole-shoe; the indication value is stable and reach the required current level.

## 2.5 Test procedures

**2.5.1** Place the specimen between the test bench and 10 contacts; slower exert a certain force: exert the force of  $1290 \times (1 \pm 5\%)N$  to the total area of  $645\text{mm}^2$ ; exert the force of  $2000 \times (1 \pm 5\%)N$  to the total area of  $1000\text{mm}^2$ , which is equivalent to the pressure of  $2\text{N}/\text{mm}^2$ .

**2.5.2** Power the electrode with a regulated power supply, and read the total current (or read by the computer).

**2.5.3** If the test is to evaluate the single-side coating insulation quality, take 10 data by the 10 contacts on the 10 representative different areas or 10 test specimens.

**2.5.4** If the test is a comprehensive evaluation of double-side coating insulation quality, the 10 contacts shall be tested on 5 representative areas selected from one-side of the steel plate or 5 test specimens; the two-side test shall not be performed within the same area of the test specimen.

## 2.6 Calculation of coating insulation resistance

### 2.6.1 Surface insulation resistance coefficient

Introduce the 10 measured current values of the 10 parallel contacts into Formula (1), calculate and obtain the surface insulation resistance coefficient (there are 10 measured values for single-side coating, or 5 measured values on each side of the