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Method for Determination of Specific Resistance of Carbon Materials

炭素材料电阻率测定方法

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Foreword

This Standard was proposed by China Iron and Steel Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel.

Drafting organizations of this Standard: Sinosteel Jilin Carbon Co., Ltd., and China Metallurgical Information and Standardization Research Institute.

Chief drafting staffs of this Standard: Wang Jun, Guo Rongyao, Kang Jian, and Cui Guowei.

Method for Determination of Specific Resistance of Carbon Materials

1 Scope

This Standard specifies the principle, apparatus, test procedures and allowable error for the determination of specific resistance of carbon materials.

This Standard is applicable to the determination of specific resistance of carbon products and graphite products at room temperature.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 1427 Sample Method of Carbon Material

GB/T 8170 Rules of Rounding off for Numerical Values & Expression and Judgement of Limiting Values

3 Principle

The specific resistance represents a property of the material, which is the amount of resistance when current passing the material. It numerically equals to the resistance value of the conductor with length (L) of 1m and sectional area (S) of 1m², which is expressed by ρ . The following formula can be obtained as per Ohm's Law and the characteristics of the conductor:

$$\rho = \frac{US}{IL}$$

Where:

ρ – Specific resistance of conductor, in $\mu\Omega\text{m}$;

Figure 3 Diagram of Testing System of Specific Resistance Tester

5.3.4 Clamp the test body on the test bench; press the current button, so that current passes the extrusion axial of test body, then read the specific resistance value.

5.3.5 When measuring the current, the test body temperature may raise; therefore, the measuring time is required to be as short as possible (not exceed 1 min); current density is lower than 1 A/cm²; so that the change of specific resistance caused by heat is no more than $\pm 0.5\%$.

6 Allowable Error

The allowable error when measuring the specific resistance of carbon materials shall be 2%.

7 Test Report

The test report shall contain the following contents:

- a) Entrusting organization;
- b) Specimen number, name and specification;
- c) Individual and average value of the test result;
- d) Potential contact spacing;
- e) Current value at the time of measurement;
- f) Testing organization;
- g) Auditors;
- h) Test date.

_____ **END** _____

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