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Copper profiles for electrical purposes

导电用铜型材

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Copper profiles for electrical purposes

1 Scope

This document specifies the classification and marking, technical requirements, test methods, inspection rules and marking, packaging, transportation, storage and accompanying documents and order form contents of copper profiles for electrical purposes (hereinafter referred to as “profiles”).

This document applies to copper profiles for electrical purposes, with a circumscribed circle diameter not exceeding 180 mm.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1: Test method

GB/T 2828.1 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 3048.2 Test methods for electrical properties of electric cables and wires - Part 2: Test of electrical resistivity of metallic materials

GB/T 4340.1 Metallic materials - Vickers hardness test - Part 1: Test method

GB/T 5121 (all parts) Methods for chemical analysis of copper and copper alloys

GB/T 5231 Designation and chemical composition of wrought copper and copper alloys

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

GB/T 8888 Wrought heavy non-ferrous metal products - Packing, marking, transportation, storing and certificate of quality

GB/T 23606 Copper-hydrogen embrittlement test method

GB/T 26303.2 Measuring methods for dimensions and shapes of wrought copper and copper alloy - Part 2: Rod, wire and profile

5.7 Surface quality

The surface of profiles shall be clean and shall not have harmful defects and joints that affect use. If no special requirements are specified on the order form or drawing, discoloration that does not affect use is allowed.

6 Test methods

6.1 Chemical composition

The chemical composition analysis method for profiles shall be carried out in accordance with the provisions of GB/T 5121 (all parts) and YS/T 482. The arbitration test method shall be carried out in accordance with the provisions of GB/T 5121 (all parts).

6.2 Dimensions and their allowable deviations

6.2.1 The dimensions of profiles shall be tested with measuring tools of corresponding accuracy.

6.2.2 The dimension testing method for profiles shall be carried out in accordance with the provisions of GB/T 26303.2.

6.3 Mechanical properties

6.3.1 Room temperature tensile test

The room temperature tensile test method for profiles shall be carried out in accordance with the provisions of GB/T 34505, and the tensile test pieces shall comply with the provisions of GB/T 34505.

6.3.2 Hardness test

The Brinell hardness test method for profiles shall be carried out in accordance with the provisions of GB/T 231.1; the Vickers hardness test method for profiles shall be carried out in accordance with the provisions of GB/T 4340.1.

6.4 Electrical properties

The test method for electrical properties of profiles shall be carried out in accordance with the provisions of GB/T 3048.2 and GB/T 32791, the arbitration test method shall be carried out in accordance with the provisions of GB/T 3048.2, and the electrical conductivity corresponding to the resistivity is shown in Annex A. The electrical properties test pieces shall be processed into samples that meet the requirements of GB/T 3048.2.

6.5 Hydrogen embrittlement test

The hydrogen embrittlement test method for profiles shall be carried out in accordance with the provisions of GB/T 23606.

6.6 Internal quality

The internal quality inspection method for profiles can refer to the provisions of YS/T 336 or be determined by the agreement between the supplier and purchaser.

6.7 Surface quality

The surface quality of profiles is visually inspected.

7 Inspection rules

7.1 Inspection and acceptance

7.1.1 Profiles shall be inspected by the supplier or a third party to ensure that the product quality meets the requirements of this document and the order form.

7.1.2 The purchaser shall inspect the received products in accordance with the provisions of this document. If the inspection results do not meet the requirements of this document or the order form, it shall be reported to the supplier and resolved by the agreement between the supplier and purchaser. Objections to surface quality, dimensions and their allowable deviations shall be raised within 1 month from the date of receipt of products; other objections shall be raised within 3 months from the date of receipt of products. If arbitration is required, it shall be determined by the agreement between the supplier and purchaser.

7.2 Batch grouping

Profiles shall be submitted for inspection in batches. Each batch shall consist of profiles of the same designation, state, specification or drawing number. The mass of each batch shall not exceed 2000 kg.

7.3 Inspection items

The inspection items of profiles are divided into factory-exit inspection items and type inspection items, see Table 16. Type inspection shall be carried out in any of the following situations:

- a) trial modeling and identification of new products or old products when transferred to other factories;
- b) when the raw materials and processes of the product have changed significantly, which may affect the product performance;
- c) when the production of the product is resumed after suspended;

Each batch of products shall be accompanied by accompanying documents, which shall include supplier information, product information, serial number of this document, factory-exit date or packaging date, and should also include.

- a) Product quality guarantee, the contents of which are as follows:
 - 1) main performance and technical parameters of the product;
 - 2) product characteristics (including manufacturing process and raw material characteristics);
 - 3) responsibility for product quality;
 - 4) quality certification obtained by the product and various analysis and test results with the seal of the supplier's technical supervision department.
- b) Product certificate, the contents of which are as follows:
 - 1) inspection items and their results or inspection conclusions;
 - 2) batch number;
 - 3) inspection date;
 - 4) signature or seal of the inspector.
- c) Inspection report during product quality control and finished product inspection report.
- d) Product instructions: correct handling, use, storage methods, etc.
- e) Others.

9 Order form contents

The order form for the materials listed in this document shall include the following contents:

- a) product name;
- b) designation;
- c) specification;
- d) state;
- e) drawing number;

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