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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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GB/T 4423-2020

Replacing GB/T 4423-2007

Copper and copper alloy cold-drawn rod and bar

铜及铜合金拉制棒

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Foreword

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

This Standard replaces GB/T 4423-2007 "Copper and copper-alloy cold-drawn rod and bar". Compared with GB/T 4423-2007, the main technical changes are as follows:

- modified scope of application (see Clause 1 of this Edition, Clause 1 of Edition 2007);
- modified representation method for state; added code (see Table 1 of this Edition, Table 1 of Edition 2007);
- added designations of H59, H70, HSn70-1, HA161-4-3-1; deleted designation of QSi1.8 (see Table 1 of this Edition, Table 1 of Edition 2007);
- added specification range of some designations (see Table 1 of this Edition);
- added T2, T3 semi-hard (H02) state, H65 semi-hard (H02) state, HPb59-1 hard (H04) state, HPb63-3 soft annealing (O60) and 1/4 hard (H01) state (see Table 1 of this Edition);
- deleted regulations of indefinite length of rod and bar; added regulations of bar length with a range of 500mm~6000mm (see Table 1 of this Edition, Table 1 of Edition 2007);
- modified allowable deviation requirements for copper and brass rectangular rod and bar AND same allowable deviation specified for square and hexagonal rod and bar (see Table 4 of this Edition, Table 4 of Edition 2007);
- modified allowable deviation of fixed length or double length of rod and bar from +15mm to +10mm (see 4.2.3 of this Edition, 3.3.3 of Edition 2007);
- modified requirements for straightness (see 4.2.6 of this Edition, 3.3.6 of Edition 2007);
- modified some mechanical performance indicators (see 4.3 of this Edition, 3.4 of Edition 2007);
- modified Brinell hardness in the mechanical properties table to Vickers hardness, Rockwell hardness and Brinell hardness; added requirements for specified plastic extension strength (see Table 8 and Table 9 of this Edition, Table 7 and Table 8 of Edition 2007);
- deleted requirements for oxygen content (see 3.6 of Edition 2007);

Copper and copper alloy cold-drawn rod and bar

1 Scope

This Standard specifies classification and marking, technical requirements, test methods, inspection rules, marks, packaging, transportation, storage and quality certificate, purchase order (or contract) content for copper and copper alloy cold-drawn rod and bar.

This Standard is applicable to general purpose round, rectangular, square and regular hexagonal copper and copper alloy cold-drawn rod and bar (hereinafter referred to as rod and bar).

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 230.1, *Metallic Rockwell hardness test - Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

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

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

GB/T 3310, *Ultrasonic testing method of copper and copper alloy bars*

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 10567.1, Wrought copper and copper alloys - Detection of residual stress - Mercury nitrate test

GB/T 10567.2, Wrought copper and copper alloys - Detection of residual stress - Ammonia test

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

GB/T 34505-2017, Copper and copper alloy materials - Tensile testing at room temperature

YS/T 336, Method of fracture test for tube and rod of copper and copper alloys, nickel and nickel alloys

YS/T 482, Methods for analysis of copper and copper alloys - The atomic emission spectrometry

YS/T 483, Methods for analysis of copper and copper alloys - X-Ray fluorescence spectrometric (wavelength dispersive)

YS/T 668, Sampling method of physical and chemical testing for copper and copper alloys

3 Classification and marking

3.1 Product classification

Designations, codes, states and specifications of rod and bar shall comply with Table 1. The aspect ratio of the rectangular rod and bar shall meet the requirements of Table 2.

6 Inspection rules

6.1 Inspection and acceptance

6.1.1 Rod and bar shall be inspected by the supplier's technical supervision department to ensure that the product quality meets the requirements of this Standard. Fill in the quality certificate.

6.1.2 The purchaser shall inspect the received products in accordance with the provisions of this Standard. If the inspection result does not conform to the provisions of this Standard (or order contract), it shall be submitted to the supplier within 1 month from the date of receipt of the product. It shall be solved by negotiation between the supplier and the purchaser. If arbitration is required, arbitration sampling shall be conducted jointly by both parties.

6.2 Batching

Rod and bar shall be submitted for acceptance in batches. Each batch shall be composed of rods and bars of the same designation, specification and state. The weight of each batch does not exceed 5000kg.

6.3 Inspection items

6.3.1 Each batch of rods and bars shall be inspected for chemical composition, dimensions and allowable deviation, internal quality and surface quality.

6.3.2 Each batch of rods and bars shall be inspected for mechanical properties (tensile test or hardness test). Choose either tensile test or hardness test. When not specified in the contract, perform tensile test. When the tensile test is selected, if the purchaser also requires hardness test and it is specified in the contract, hardness test shall also be carried out. The hardness test results are for reference only. When choosing hardness test, when the purchaser also requires tensile test and it is specified in the contract, tensile test shall also be carried out. The tensile test results are for reference only.

6.3.3 When requested by the purchaser, residual stress inspection shall also be carried out.

6.4 Sampling

Product sampling shall meet the requirements of Table 11. Sampling method is carried out in accordance with YS/T 668.

properties, fracture and residual stress, double the number of samples shall be taken from the batch of products (including the one that failed the original inspection) for the reinspection of rejected items. If all retest results are conforming, the batch of products shall be accepted. If there is still sample failing in the retest result, the batch of products shall be rejected. Or it is inspected by the supplier piece by piece and only accepted products are delivered.

6.5.5 When the ultrasonic flaw detection is nonconforming, it shall be rejected by piece.

6.5.6 When there are other defects, it shall be negotiated and determined by both parties.

7 Marks, packaging, transportation, storage and quality certificate

Product's marks, packaging, transportation, storage and quality certificate shall comply with GB/T 8888.

8 Order sheet (or contract) content

The order sheet (or contract) for rod and bar listed in this Standard shall include the following:

- a) Product name;
- b) Designation (or code);
- c) State;
- d) Specifications;
- e) Accuracy level (normal level or high-precision level);
- f) Weight or number of pieces;
- g) Selection of tensile test and hardness test;
- h) Residual stress (when necessary);
- i) Reference to this Standard;
- j) Others.

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