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# Copper Alloy Seamless Coil Tube for Sheath

# 铜合金护套无缝盘管

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**Standardization Administration of the People's Republic of China.**

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# Copper Alloy Seamless Coil Tube for Sheath

## 1 Scope

This Document stipulates the classification and labeling, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage and accompanying documents and order forms of copper alloy seamless coil tube for sheath (hereinafter referred to as "tube").

This Document is applicable to copper alloy seamless coil tube for sheath used in high-speed railways, urban rail transit, communication optical cables, safety conductor cables and other fields.

## 2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 242 Metallic Materials Tube - Drift Expanding Test

GB/T 246 Metallic Materials - Tube - Flattening Test

GB/T 2828.1 Sampling procedures for inspection by attribute - Part1: 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 alloy

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, transporting and storing

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

GB/T 26125 Electrical and electronic products - Determination of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)

GB/T 26303.1 Measuring method for dimensions and shapes of wrought copper and copper alloy - Part 1: Tube

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

YS/T 347 Copper and copper alloys - Estimation of average grain size

YS/T 482 Method 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 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

**3.1 Precise coiling coil**

The tubes in the delivery state are finished by the winding machine and turned into coils arranged relatively regularly up and down.

**3.2 Free coiling coil**

After the tube is produced, it is cut into rolls by a stretching machine, forming an irregularly arranged coil in the basket.

# 4 Classification and Labelling

**4.1 Product classification**

The designation, code, state, type and specification of the tube shall comply with the provisions of Table 1.

**6.2 Overall dimension and its tolerance**

The measurement method of overall dimension and its tolerance of the tube shall be carried out in accordance with the provisions of GB/T 26303.1.

**6.3 Mechanical properties**

**6.3.1** The tensile test of the tube shall be carried out in accordance with the provisions of GB/T 34505-2017. The tensile test specimens with an outer diameter of the tube less than or equal to 30mm shall be carried out in accordance with the provisions of full-section specimens specified in GB/T 34505-2017. For the tube with outer diameter greater than 30mm, it shall be carried out according to the provisions of S1 specimen specified in GB/T 34505-2017.

**6.3.2** The hardness test method of the tube shall be carried out in accordance with the provisions of GB/T 4340.1.

**6.4 Volume resistivity**

The measurement method of the volume resistivity of the tube shall be carried out according to the method specified in GB/T 3048.2.

**6.5 Process performance**

**6.5.1** The drift-expanding test of the tube shall be carried out in accordance with the provisions of GB/T 242.

**6.5.2** The flattening test of the tube shall be carried out in accordance with the provisions of GB/T 246.

**6.6 Grain size**

The grain size inspection of the tube shall be carried out in accordance with the provisions of YS/T 347.

**6.7 Environmental requirements**

The detection of harmful substance content in the tube shall be carried out in accordance with the provisions of GB/T 26125.

**6.8 Residual stress**

The residual stress test of the tube shall be carried out in accordance with the provisions of GB/T 10567.2.

**6.9 Surface quality**

The surface quality of the tube is inspected visually.

# 7 Inspection Rules

### 7.1 Inspection and acceptance

**7.1.1** Tubes shall be inspected by the supplier or a third party to ensure that the product quality complies with the provisions of this Document and the requirements of the order form.

**7.1.2** The purchaser may inspect the received products in accordance with the provisions of this Document. If the inspection results are inconsistent with the provisions of this Document and the requirements of the order form, it shall be submitted to the supplier in written, and the purchaser and the supplier shall negotiate and resolve. Objections related to surface quality and dimensions shall be raised within 1 month from the date of receipt of the product. Objections related to other performance shall be raised within 3 months from the date of receipt of the product. If arbitration is needed, it shall be determined by both the supplier and the purchaser through joint sampling or negotiation on the supplier side.

### 7.2 Batching

Tubes shall be submitted for acceptance in batches. The weight of each batch of tubes shall not exceed 5000kg.

### 7.3 Inspection

Product inspection items are divided into exit-factory inspection and type inspection, which shall comply with the provisions of Table 7. When any of the following situations occurs, type inspection shall be carried out:

a) Trial prototype identification of new products or old products transferred to other factories;

b) When there are major changes in the raw materials and processes of the product, which may affect product performance;

c) After the product is discontinued, when production is resumed;

d) When the exit-factory inspection results are significantly different from the last type inspection;

e) When type inspection has not been carried out for two consecutive years;

f) When required by the purchaser (specified in the order form);

g) When the national quality supervision agency requests type inspection.

# 8 Marking, Packaging, Transportation, Storage and Accompanying Document

## 8.1 Marking

### 8.1.1 Product marking

Tubes that have passed the inspection shall have the following marks (or labels):

a) Product label;

b) Batch number;

c) Date of production;

d) Net weight;

e) Others.

### 8.1.2 Packaging marking

The marking of packaging box of tubes shall comply with the provisions of GB/T 8888.

## 8.2 Packaging, transportation and storage

**8.2.1** The packaging, transportation and storage of tubes shall comply with the provisions of GB/T 8888.

**8.2.2** If there are special requirements for packaging methods, they shall be determined through negotiation between the supplier and the purchaser.

## 8.3 Accompanying document

Each batch of products shall be accompanied by accompanying documents, which shall include the following information, in addition to supplier information, product information, this document number, exit-factory date or packaging date.

a) Product quality warranty, the contents are as follows:

1) The main performance and technical parameters of the product;

2) Product characteristics (including manufacturing process and raw material characteristics);

3) Responsibility for product quality;

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