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**GB**

NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

ICS 29.060.10

CCS K 11

**GB/T 4910-2022**

Replacing GB/T 4910-2009

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**Tinned round copper wire**

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**Issued on: July 11, 2022**

**Implemented on: February 01, 2023**

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**Issued by: State Administration for Market Regulation;  
Standardization Administration of the People's Republic of China.**

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## Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*.

This document replaces GB/T 4910-2009 *Tinned round copper wire*. Compared with GB/T 4910-2009, in addition to structural adjustments and editorial changes, the main technical changes of this document are as follows:

- Amend the normative references (see Chapter 2; Chapter 2 of the 2009 edition);
- Add the model and specification of tinned hard round copper wire (see 4.1, 4.2);
- Change the specification range of tinned round copper wire (see 4.2; Chapter 4 of the 2009 edition);
- Change the material of tinned round copper wire (see Chapter 5; Chapter 5 of the 2009 edition);
- Change the diameter deviation of tinned round copper wire (see Chapter 6; Chapter 6 of the 2009 edition);
- Add the tensile strength, elongation and DC resistivity at 20°C of tinned hard round copper wire (see Chapter 7 and Chapter 8);
- Add the sample gauge length requirements for the elongation test (see 7.2);
- Change the test method requirements for coating (see Chapter 9; Chapter 9 of the 2009 edition);
- Change the test method and requirements of solderability (see Chapter 10; Chapter 10 of the 2009 edition);
- Add requirements for regulated substances of tinned round copper wire (see Chapter 11);
- Change the test method corresponding to the inspection item (see 12.2; 11.2 of the 2009 edition).

Please note that some of the contents of this document may involve patents. The issuing organization of this document is not responsible for identifying patents.

This document was proposed by China Electrical Equipment Industry Association.

This document shall be under the jurisdiction of National Technical Committee 422 on Bare Wires of Standardization Administration of China (SAC/TC 422).

# Tinned round copper wire

## 1 Scope

This document specifies the models, specifications, materials, diameter deviation, mechanical and electrical properties, coating, solderability, requirements for regulated substances, acceptance rules, packaging and marking of tinned round copper wire.

This document applies to tinned round copper wires for connecting wires, cables and electronic equipment, including tinned soft round copper wires, solderable tinned soft round copper wires and tinned hard round copper wires.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable to its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 728, Tin ingot

GB/T 2423.28-2005, Basic environmental testing procedures for electric and electronic products - Part 2: Test methods - Test T: Soldering

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 3952, Copper drawing stock for electrical purpose

GB/T 4909.2, Test methods for bare wires - Part 2: Measurement of dimensions

GB/T 4909.3, Test methods for bare wires - Part 3: Tensile test

GB/T 4909.9-2009, Test methods for bare wires - Part 9: Test for continuity of coating - Sodium polysulfide solution method

GB/T 4909.10, Test methods for bare wires - Part 10: Test for continuity of coating - Ammonium persulphate solution method

GB/T 4909.11, Test methods for bare wires - Part 11: Test for adherence of coating

GB/T 4909.12, Test methods for bare wires - Part 12: Solderability test of coating - Solder globule method

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

GB/T 26572, Requirements of concentration limits for certain restricted substances in electrical and electronic products

### **3 Terms and definitions**

No terms and definitions need to be defined in this document.

### **4 Product representation method**

#### **4.1 Models**

See Table 1 for the models of tinned round copper wires.

#### **4.2 Specifications**

The specification of tinned round copper wire is indicated by the nominal diameter  $d$ , as shown in Table 2.

#### **4.3 Representation method**

The tinned round copper wire is represented by model, specification and the number of this document.

**Example 1:** TXR 0.500 GB/T 4910-2022 represents: tinned soft round copper wire, of nominal diameter 0.500 mm, in soft state.

## 9 Coating

**9.1** The surface of the tin coating shall be smooth and continuous, and shall be free from defects affecting product performance. Check with normal vision.

**9.2** The tin coating shall be continuous. As required by the buyer, the test for continuity of coating of the tinned round copper wire shall be carried out in accordance with GB/T 4909.9-2009 or GB/T 4909.10. When following GB/T 4909.9-2009, the test shall be carried out according to the test procedure a) in 5.5 of GB/T 4909.9-2009, the immersion cycle shall be 2 cycles, and the surface of the sample shall not turn black after the test. When testing according to GB/T 4909.10, the color of the solution shall not be darker than that of the standard colorimetric solution.

**9.3** The tin coating be firmly attached to the surface of the copper wire. The test for adherence of coating of tinned round copper wire shall be carried out in accordance with GB/T 4909.11, and the sample shall be wound on a test rod of 4 times its nominal diameter. After the tinned round copper wire is subjected to the test for adherence of coating, the outer peripheral surface of the spirally wound part of the sample shall not turn black, and the coating shall have no cracks.

## 10 Solderability

TXRH-type tinned round copper wire shall be solderable.

As required by the buyer, the solderability test of the TXRH-type tinned round copper wire shall be carried out in accordance with GB/T 4909.12 or GB/T 2423.28-2005. When following GB/T 4909.12, the welding time shall not be greater than 2 s. When following GB/T 2423.28-2005, the test method 1 in 4.6 of GB/T 2423.28-2005 (slot welding at a temperature of 235 °C) shall be used for the test. After the test, the surface of the sample shall be covered with a layer of smooth and bright solder layer, and shall not have concentrated defects such as pinhole non-wetting or weakly wetting areas.

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