

ICS 77.150.30
CCS H62



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3114-2023

Copper and copper alloy rectangular wire

铜及铜合金扁线

Issued on: August 6, 2023

Implemented on: March 1, 2024

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Classification and identification	6
5 Technical requirements	8
6 Test methods	14
7 Inspection rules	15
8 Marking, packaging, transportation, storage and accompanying documents	18
9 Order form content	19

Foreword

This document was issued on 6 August 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 March 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 3114-2023 covers rectangular wire made from copper and copper alloys, the flat section stock supplied in coils and on spools for windings, contacts and conductor work. It classifies the product by designation, code, temper, dimensions and method of supply, sets the technical requirements on chemical composition among the properties it fixes, and gives the test methods, with composition analysis carried out to the GB/T 5121 series or the YS/T methods. Inspection rules cover who inspects, how a lot is formed and sampled, and what happens when a lot fails. Further clauses fix marking, packaging, transport and storage, the documents that travel with the consignment, and the information an order has to state. That last clause carries more weight than its length suggests. Rectangular wire is bought to a cross-section and a temper for one particular winding, and edge condition, straightness and the way the wire comes off the spool decide whether it lies flat in a slot or on a former without gaps or surface damage. A hard temper delivered where a soft one was wanted, or a coil that springs when the binding is cut, stops a winding line and the wire cannot be reworked into shape. Wire mills, motor and transformer winders, connector makers and purchasing engineers use it.

This document specifies the classification and identification, technical requirements, test methods, inspection rules, as well as marking, packaging, transportation, storage, accompanying document and order form content of copper and copper alloy rectangular wire (hereinafter referred to as "rectangular wire").

This document applies to pure copper, brass, bronze and cupronickel rectangular wires for industrial use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 238, Metallic materials - Wire - Reverse bend test

GB/T 239.1, Metallic materials - Wire - Part 1: Simple torsion test

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 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 judgment of limiting values

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

GB/T 10567 (all parts), Wrought copper and copper alloys - Detection of residual stress

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, Copper and copper alloy materials - Tensile testing at room temperature

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

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

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 Terms and definitions

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

3.1

free roll

Uncoiled roll-shaped rectangular wires that are freely formed in a certain direction and sequence.

3.2

close-packed roll

Rectangular wires, wound layer by layer, arranged closely according to certain winding direction rules.

4 Classification and identification

4.1 Product classification

The designation, code, state, specifications and supply method of rectangular wires shall comply with the provisions of Table 1.

5.9.2 When the weight per roll (reel) is less than or greater than 10% of the weight specified in Table 8, it is a lighter roll (reel) or a heavier roll (reel), and the number of lighter rolls (reels) or heavier rolls (reels) in each batch shall not exceed 10% of the total number of rolls (reels).

5.9.3 If the buyer has special requirements for the roll (reel) weight of rectangular wires,

it shall be determined through negotiation between the supplier and the buyer.

6 Test methods

6.1 Chemical composition

The chemical composition analysis of rectangular wires shall be carried out in accordance with the provisions of GB/T 5121 (all parts), YS/T 482 or YS/T 483. The arbitration shall be conducted in accordance with the provisions of GB/T 5121 (all parts).

6.2 Dimensions and their allowable deviation

The overall dimensions and allowable deviations of rectangular wires shall be in accordance with the provisions of GB/T 26303.2.

6.3 Mechanical properties

The room temperature tensile mechanical properties of rectangular wires shall be tested in accordance with the provisions of GB/T 34505. The test portions shall comply with the requirements of GB/T 34505.

6.4 Process performance

6.4.1 The reverse bend test of rectangular wires shall be carried out in accordance with the provisions of GB/T 238.

6.4.2 The torsion test of rectangular wires shall be carried out in accordance with the provisions of GB/T 239.1.

6.5 Grain size

The grain size detection of rectangular wires shall be carried out in accordance with the provisions of YS/T 347.

6.6 Residual stress

The residual stress inspection of rectangular wires shall be carried out in accordance with the provisions of GB/T 10567 (all parts).

6.7 Internal quality

The internal quality inspection of rectangular wires shall be carried out in accordance with the provisions of YS/T 336.