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# National Standard of the People's Republic of China

GB/T 12769-2025

Replaces GB/T 12769-2015

# Titanium-clad copper bar

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# Foreword

This document is drafted in accordance with the provisions of GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standard Documents.

This document replaces GB/T 12769-2015 Titanium-Copper Clad Rods. Compared with GB/T 12769-2015, the main technical changes, in addition to structural adjustments and editorial revisions, are as follows:

a) Deleted the manufacturing methods limited to the clad rods, including the hot extrusion process, hot extrusion and drawing process, explosive cladding process, and explosive cladding and hot rolling process (see Chapter 1 of the 2015 edition);

b) Deleted grades TA1 and TA2 in the cladding material (see 3.1.1.1 of the 2015 edition);

c) Deleted BR and BM delivery conditions of the clad rods (see 3.1.1.2 of the 2015 edition);

d) Added titanium-copper-steel clad rod products and their relevant requirements (see 4.1.1, Table 1 and Table 2);

e) Revised the specification requirements for the cross-sectional dimensions of rectangular clad rods (see Table 1, replacing Table 1 of the 2015 edition);

f) Revised the chemical composition requirements for the cladding material of the clad rods (see 5.1.2, replacing 3.2.2 of the 2015 edition);

g) Added the chemical composition requirements for the core material of the clad rods (see 5.1.3);

h) Revised the straightness requirements for the clad rods (see 5.2.4, replacing 3.3.4 of the 2015 edition);

i) Added the requirements for the testing system of the clad rods (see A.2.4).

Please note that certain contents of this document may involve patents. The issuing body of this document shall not be liable for identifying any such patents.

This document was proposed by the China Nonferrous Metals Industry Association.

This document is administered by the National Technical Committee 243 on Non-ferrous Metals Standardization of Standardization Administration of China (SAC/TC 243).

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This document was first issued in 1991, revised for the first time in 2003, revised for the second time in 2015, and this is its third revision.

# Titanium-clad copper bar

## 1 Scope

This document specifies the classification and marking, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, accompanying documents and order form contents of titanium-copper clad rods.

This document is applicable to titanium-copper/titanium-copper-steel clad rods (hereinafter referred to as clad rods) used for manufacturing metal anode electrolytic cells and for other purposes.

## 2 Normative References

The contents of the following documents constitute an indispensable part of this document through normative reference in the text. For dated reference documents, only the edition corresponding to that date applies to this document; for undated reference documents, the latest edition (including all amendments) applies to this document.

GB/T 700 Carbon Structural Steels

GB/T 3620.1 Titanium and Titanium Alloys - Designation and Chemical Compositions

GB/T 5231 Wrought Copper and Copper Alloys - Designation and Chemical Compositions

GB/T 6611 Terminology and Atlas for Titanium and Titanium Alloys

GB/T 15073 Cast Titanium and Titanium Alloys

GB/T 38982 Methods for Dimensional Inspection of Wrought Titanium and Titanium Alloy Products

JB/T 10061 General Technical Conditions for Type A Pulse Reflection Ultrasonic Flaw Detectors

## 3 Terms and Definitions

The terms and definitions defined in GB/T 6611 and GB/T 38982 apply to this document.

## 4 Classification and Marking

### 4.1 Product Classification

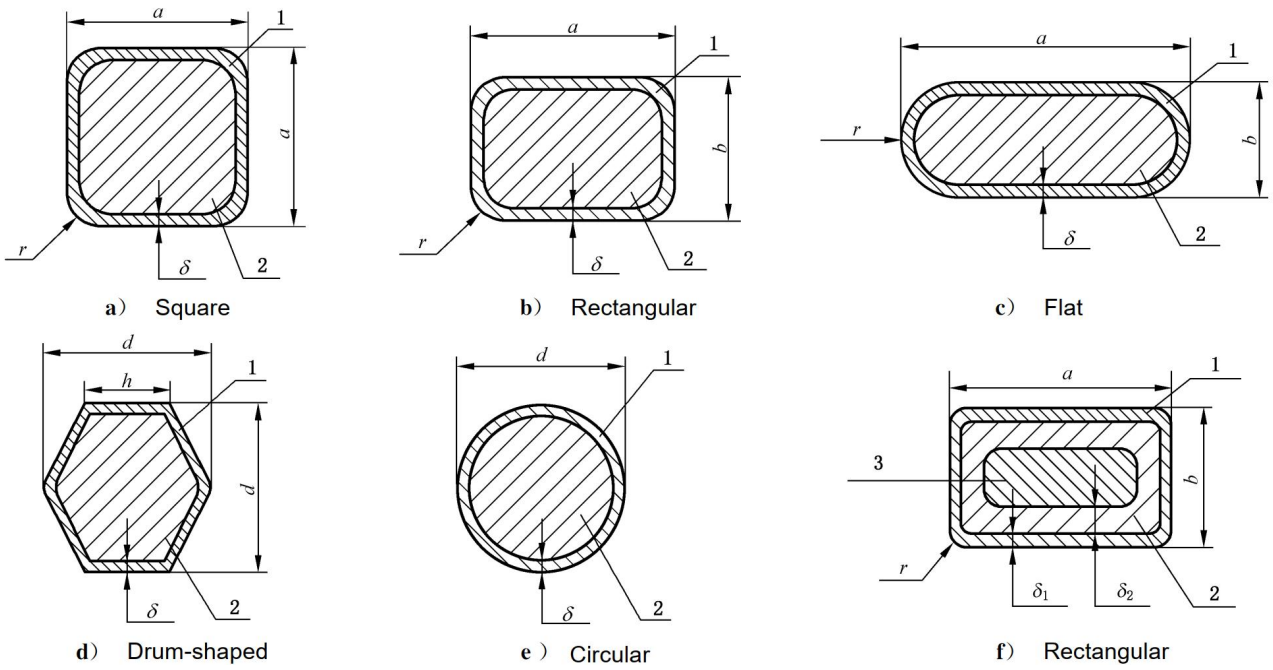
#### 4.1.1 Classification, Condition and Cross-sectional Shape

**4.1.1.1** Clad rods are classified into titanium-copper clad rods and titanium-copper-steel clad rods. The base material of clad rods is copper, with typical grades including T1, T2, etc.; the cladding material is titanium, with typical grades including ZTA1, ZTA2, TA1G, TA2G, TA3G, etc.; the core material of titanium-copper-steel clad rods is steel, with a typical grade of Q235, etc.

**4.1.1.2** Clad rods are supplied in the hot worked condition (R), cold worked condition (Y) and annealed condition (M).

**4.1.1.3** The cross-sectional shapes of clad rods are shown in Figure 1. Clad rods are classified by cross-sectional shape into square clad rods (FXB), rectangular clad rods (JXB), flat clad rods (BXB), drum-shaped clad rods (GXB) and circular clad rods (YXB).

**Figure 1 Cross-sectional Shapes of Clad Rods**




Explanation of Index Numbers and Symbols

1 — Cladding material;

2 — Base material;

3 — Core material;

a — Side length or width of the clad rod;

b — Thickness of the clad rod;

d — Diameter of the clad rod;

r — Arc radius of the clad rod;

h — Plane width of the clad rod;

δ — Cladding material thickness of the titanium-copper clad rod;

$\delta_1$ — Cladding material thickness of the titanium-copper-steel clad rod;

$\delta_2$ — Base material thickness of the titanium-copper-steel clad rod.

### 4.1.2 Representation and Specifications

**4.1.2.1** The cross-sectional representation and specifications of clad rods shall comply with the requirements specified in Table 1.

**Table 1 Cross-sectional Representation and Specifications of Clad Rods**

| Type of Clad Rod | Cross-sectional Shape | Cross-sectional Representation | Specifications<br>mm |
|---|---|---|---|
| Titanium-Copper Clad Rod | Square | $a \times a \times \delta - r$ | (24～33)×(24～33)×(1.5～2.0)－5.0 |
| | Rectangular | $a \times b \times \delta - r$ | (20～40)×(15～25)×(1.0～1.5)－(2.0～3.0) |
| | | | (＞40～50)×(10～15)×(1.0～1.5)－(2.0～3.0) |
| | | | (＞40～50)×(＞15～40)×(1.5～2.0)－(3.0～5.0) |
| | | | (＞50～80)×(12～35)×(1.5～2.0)－(3.0～5.0) |
| | | | (＞50～80)×(＞35～40)×(2.0～2.5)－(3.0～5.0) |
| | | | (＞80～100)×(15～30)×(1.5～2.0)－(3.0～8.0) |
| | | | (＞100～140)×(30～40)×(2.0～2.5)－(3.0～8.0) |