

Translated English of Chinese Standard: GB/T8769-2010

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 77.150.99

H 63

GB/T 8769-2010

Replacing GB/T 8769-1988

Zirconium and Zirconium Alloy Bars and Wires

锆及锆合金棒材和丝材

Issued on: January 14, 2011

Implemented on: November 01, 2011

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;**

Standardization Administration of PRC.

Table of Contents

Foreword.....	3
1 Scope.....	5
2 Normative References	5
3 Requirements	5
4 Test Method	10
5 Inspection Rules	10
6 Marking, Packaging, Transportation, Storage and Quality Certificate	12
7 Contract (or Purchase Order) Content.....	13
Appendix A (Informative) Comparison of Designations in this Standard, ASTM and ASME Standards	14

Zirconium and Zirconium Alloy Bars and Wires

1 Scope

This Standard specifies requirements, test methods, inspection rules and markings, packaging, transportation, storage, and contract (or purchase order) content, etc. for zirconium and zirconium alloy bars and wires.

This Standard is applicable to zirconium and zirconium alloy bars and wires produced by extrusion, forging, rolling, drawing and other processes.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 228 Metallic Materials - Tensile Testing at Ambient Temperature

GB/T 4338 Metallic Materials - Tensile Testing at Elevated Temperature

GB/T 8180 Wrought Titanium and Titanium Alloy Products Packing, Marking, Transporting and Storing

GB/T 13747 (all parts) Methods for Chemical Analysis of Zirconium and Zirconium Alloys

GB/T 26314 Designation and Composition of Zirconium and Zirconium Alloys

3 Requirements

3.1 Classification of products

3.1.1 Designation, state and specification

The designation, state and specification of the bars and wires shall comply with the provisions of Table 1

specimens shall be corroded for 72 h or 336 h in water vapor at $400^{\circ}\text{C} \pm 5^{\circ}\text{C}$, and $10.3^{+0.7}_{-0.5}$ MPa.

3.5.2 After the corrosion test, the surface of the specimen shall be a black, dense, uniform gloss oxide film, without white or brown corrosion products; and the weight gain of the specimen within 72h shall not exceed 22 mg/dm^2 . When the 72h test result is disqualified, the cumulative time (or re-sampling) 336h corrosion test can be continued, and the weight gain shall not exceed 38 mg/dm^2 .

3.6 Microstructure and macrostructure

3.6.1 Wires and bars with a diameter or side length greater than 3 mm are not allowed to have cracks, folds, pores, segregation, tail shrinkage, metallic or non-metallic inclusions, and other visible metallurgical defects at the horizontal macrostructure.

3.6.2 When required by the purchaser and specified in the contract, the bar can be inspected by microstructure, and the acceptance index shall be negotiated and determined by the supplier and the purchaser.

3.7 Ultrasonic inspection

When required by the purchaser and specified in the contract, the turning (grounding) bars can be subjected to ultrasonic inspection, and the acceptance index shall be negotiated and determined by the supplier and the purchaser.

3.8 Appearance quality

3.8.1 Wire

3.8.1.1 The wire is generally straight wire with cold-working or alkali pickling surface, and a diameter of no less than 2.0 mm. Grounding surface can be supplied when required by the buyer and specified in the contract.

3.8.1.2 The surface of the wire shall be clean, and no cracks, peeling, thorns and inclusions are allowed.

3.8.1.3 The wire is allowed to have slight local scratches, abrasions, spots and pits that do not exceed the allowable deviation of the wire.

3.8.2 Bar

3.8.2.1 The surface roughness R_a of the turning (grounding) bar that requires ultrasonic flaw detection in the contract shall be no greater than $3.2\mu\text{m}$ (to meet the flaw detection requirements).

3.8.2.2 The surface of the bar shall be clean and free of foreign objects. The surface shall not be allowed to have transverse cracks and longitudinal splits. Scratches,

indentations and pits with a depth not exceeding half of the allowable deviation of the size are allowed. Local defects are allowed to be removed, and the depth of removal shall be no greater than the allowable deviation of its size, and the ratio of width to depth of the removed part shall be greater than 6.

4 Test Method

4.1 The chemical composition analysis method shall be carried out in accordance with the provisions of GB/T 13747.

4.2 The size and allowable deviation are measured by measuring tools with corresponding accuracy.

4.3 The tensile performance test of the bar at room temperature shall be carried out in accordance with the provisions of GB/T 228.

4.4 The tensile test of the bar at elevated temperature shall be carried out in accordance with the provisions of GB/T 4338.

4.5 The corrosion performance test of the bar shall be carried out according to the method of the supplier and the purchaser.

4.6 Microstructure and macrostructure inspection shall be carried out according to the method determined by the supplier and the purchaser.

4.7 The ultrasonic inspection method shall be carried out according to the method determined by the supplier and the purchaser.

4.8 The appearance quality of the bars shall be inspected visually.

5 Inspection Rules

5.1 Inspection and acceptance

5.1.1 The product shall be inspected by the supplier's quality inspection department to ensure that the quality of the product comply with the provisions of this Standard and the contract (or purchase order); and the quality certificate shall be filled in.

5.1.2 The purchaser shall re-inspect the received product in accordance with the provisions of this Standard. If the re-inspection result does not conform to the provisions of this Standard and the contract (or purchase order), it shall be submitted to the supplier in written form; and both parties shall solve through negotiation. Objections related to surface quality and dimensional deviations shall be submitted within one month from the date of receipt of the product. Objections related to other

5.5 Judgment of inspection results

5.5.1 If the chemical composition of the product is disqualified, the batch of products shall be deemed disqualified.

5.5.2 When the product size, allowable deviation, and appearance quality are disqualified, a single piece (reel, roll) is judged to be disqualified. However, the supplier is allowed to remove the disqualified part and re-inspect, and the qualified one shall deliver the goods.

5.5.3 When a specimen is disqualified in the mechanical performance test result, another double number of samples shall be taken from the batch of bars (including the disqualified bars in the original inspection) to repeat the test for the disqualified item. If there are still disqualified inspection results, the whole batch of bars shall be deemed disqualified. However, the supplier is allowed to inspect the remaining bars one by one, and the qualified ones shall be re-batched for delivery. The product can also be re-sampled for inspection after re-heat treatment.

5.5.4 When there are cracks, non-metallic inclusions and shrinkage in the macrostructure specimen, the supplier is allowed to inspect one by one to remove the defective products and deliver the qualified products.

5.5.5 When the corrosion performance and microstructure are disqualified, the supplier and the purchaser shall negotiate and resolve.

5.5.6 When the ultrasonic flaw detection is disqualified, the bar shall be judged as disqualified.

6 Marking, Packaging, Transportation, Storage and Quality Certificate

6.1 Marking

Labels or tags should be attached to the products that have passed the inspection, and the marking contents on which shall be as follows:

- a) The name of the manufacturer;
- b) Product designation, status and specification;
- c) Product batch number or smelting furnace number.

6.2 Packaging, transportation and storage

The packaging, transportation and storage of the product shall refer to the provisions

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----