

Translated English of Chinese Standard: GB/T33953-2017

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

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.60

H 44

GB/T 33953-2017

**Corrosion resistance bars for the
reinforcement of concrete**

钢筋混凝土用耐蚀钢筋

Issued on: July 12, 2017

Implemented on: April 01, 2018

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

Standardization Administration of the PRC.

Table of Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Definitions.....	7
4 Classification and designation.....	7
5 Order content	7
6 Dimensions, shape, weight and allowable deviation	8
7 Technical requirements.....	8
8 Test methods	11
9 Inspection rules	14
10 Packaging, marking, and certification.....	15

Corrosion resistance bars for the reinforcement of concrete

1 Scope

This Standard specifies the definitions, classification, designation, order content, dimensions, shape, weight and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking, and certification, etc. of corrosion resistance bars for the reinforcement of concrete.

This Standard applies to hot rolled or controlled-rolling controlled-cooling corrosion resistance ribbed bars for the reinforcement of concrete which meet the requirements of durability design (hereinafter referred to as bars).

This Standard does not apply to stainless-steel bars.

2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 222 Permissible Tolerances for Chemical Composition of Steel Products

GB/T 223.5 Steel and iron - Determination of acid-soluble silicon and total silicon content - Reduced molybdsilicate spectrophotometric method

GB/T 223.11 Iron, steel and alloy - Determination of chromium content - Visual titration or potentiometric titration method

GB/T 223.12 Methods for chemical analysis of iron, steel and alloy - The sodium carbonate separation-diphenyl carbazide photometric method for the determination of chromium content

GB/T 223.14 Methods for Chemical Analysis of Iron, Steel and Alloy - The N-Benzoyl-N-Phenylhydroxylamine Extraction Photometric Method for the Determination of Vanadium Content

GB/T 223.17 Methods for chemical analysis of iron, steel and alloy - The

dianitropyrlmethane photometric method for the determination of titanium content

GB/T 223.19 Methods for chemical analysis of iron steel and alloy - The neocuproine-chloroform extraction photometric method for the determination of copper content

GB/T 223.23 Iron, Steel and Alloy - Determination of Nickel Content - The Dimethylglyoxime Spectrophotometric Method

GB/T 223.26 Iron, steel and alloy - Determination of molybdenum content - The thiocyanate spectrophotometric method

GB/T 223.27 Methods for chemical analysis of iron, steel and alloy - The thiocyanate-butyl acetate extraction spectrophotometric method for the determination of molybdenum content

GB/T 223.37 Methods for Chemical Analysis of Iron, Steel and Alloy - the Indophenol Blue Photometric Method for the Determination of Nitrogen Content after Distillation Separation

GB/T 223.40 Iron, Steel and Alloy - Determination of Niobium Content by the Sulphochlorophenol S Spectrophotometric Method

GB/T 223.49 Methods for chemical analysis of iron, steel and alloy - Extraction separation-chlorophosphonazo mA spectrophotometric method for the determination of the total rare earth content

GB/T 223.59 Iron, Steel and Alloy - Determination of Phosphorus Content - Bismuth Phosphomolybdate Blue Spectrophotometric Method and Antimony Phosphomolybdate Blue Spectrophotometric Method

GB/T 223.63 Methods for chemical analysis of iron, steel and alloy - The sodium (potassium) periodate photometric method for the determination of manganese content

GB/T 223.85 Steel and iron - Determination of sulfur content - Infrared absorption method after combustion in an induction furnace

GB/T 223.86 Steel and iron - Determination of total carbon content - Infrared absorption method after combustion in an induction furnace

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 232 Metallic materials - Bend test

GB/T 1499.2 Steel for the reinforcement of concrete - Part 2: Hot rolled ribbed bars

GB/T 2101 General requirement of acceptance, packaging, marking and certification for section steel

GB/T 4336 Carbon and low-alloy steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (routine method)

GB/T 17505 Steel and steel products - General technical delivery requirements

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition

GB/T 20123 Steel and iron - Determination of total carbon and sulfur content - Infrared absorption method after combustion in an induction furnace (routine method)

GB/T 20124 Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas

GB/T 20125 Low-alloy steel - Determination of multi-element contents - Inductively coupled plasma atomic emission spectrometric method

GB/T 28900 Test methods of steel for reinforcement of concrete

YB/T 081 Rule for rounding off of numerical values and judgement of testing values for technical standards of metallurgy

YB/T 4367 Steel bars corrosion test method in chloride environment

YB/T 4368 Steel bars corrosion test method in industrial atmosphere environment

YB/T 4369 Test method for the corrosion of steel bar embedded in concrete in chloride environment

YB/T 5126 Steel bars for reinforcement of concrete - Bend and rebend tests

JGJ 18 Specification for welding and acceptance of reinforcing steel bars

JGJ/T 27 Standard for test methods of welded joint of reinforcing steel bars

JGJ 107 Technical specification for mechanical splicing of steel reinforcing bars

may be appropriately relaxed.

7.1.4 The permissible tolerances for chemical composition of bar products shall comply with the provisions of GB/T 222.

7.2 Smelting method

The steel is smelted by a converter or an electric furnace.

7.3 Delivery state and delivery type

7.3.1 The bars are delivered in hot rolled or controlled-rolling controlled-cooling state.

7.3.2 The bars are usually delivered in straight bars. Bars with a diameter of no more than 16 mm may also be delivered in coils.

7.4 Mechanical properties

7.4.1 The eigenvalues of mechanical properties of the bars such as the lower yield strength R_{eL} , tensile strength R_m , percentage elongation after fracture A , and total elongation A_{gt} under maximum force shall be in accordance with Table 3. The mechanical property eigenvalues listed in Table 3 may be used as guarantee values of delivery inspection.

7.4.2 The percentage elongation after fracture A of each designation of bars with a nominal diameter of 28 mm~40 mm may be reduced by 1% (absolute value). The percentage elongation after fracture A of each designation of bars with a nominal diameter of more than 40 mm may be reduced by 2% (absolute value).

7.4.3 For bars without significant yield, the lower yield strength eigenvalue R_{eL} shall be the specified plastic elongation strength $R_{p0.2}$.

7.5.2.3 The bend test may be replaced by a rebend test.

7.5.2.4 The bending indenter diameter of rebend test, compared with the bend test, is increased by one nominal diameter of the bar.

7.6 Other requirements

Fatigue property, grain size, and surface quality shall comply with the provisions of GB/T 1499.2.

7.7 Splicing property

7.7.1 It is recommended to use mechanical splicing for the bars. The mechanical splicing joints shall use the alloy material with the same corrosion resistance grade as the bar and shall be inspected in accordance with JGJ 107.

7.7.2 If welding splicing method is used, the welding process shall be determined by both the supplier and the purchaser through negotiation and test. The welding is performed using the welding material with the same corrosion resistance grade. According to JGJ/T 27 and JGJ 18, the joint is inspected.

7.8 Corrosion resistance

7.8.1 The bars shall be subjected to corrosion resistance test. The industrial atmospheric corrosion resistance bar is inspected according to YB/T 4368. The chloride corrosion resistance bar is inspected according to YB/T 4367. The chloride corrosion resistance bar, based on the needs of both the supplier and the purchaser, may also be inspected according to YB/T 4369.

7.8.2 The relative corrosion rate of bars is calculated by formula (1). The bars, compared with the designation HRB400 in GB/T 1499.2, have a relative corrosion rate less than 70%.

$$\text{Relative corrosion rate} = \frac{\text{Average corrosion rate of corrosion resistance bar, average corrosion rate of ordinary bar}}{\text{Total length of sample} \times \text{Theoretical weight}} \times 100\% \quad \text{..... (1)}$$

8 Test methods

8.1 Inspection items

8.1.1 The inspection items, sampling quantities, sampling methods, and test methods for each lot of bars shall comply with the requirements of Table 5.

9.2.2.1 The bars shall, in lots, be inspected and accepted. Each lot consists of the bars of the same designation, the same furnace number, and the same specification. The weight of each lot is usually no more than 60 t. For a portion exceeding 60 t, for each additional 40 t (or a remainder of less than 40 t), ADD one tensile test sample and one bend test sample.

9.2.2.2 It is allowed to form a mixed lot from different furnace numbers of the same designation, the same smelting method, and the same pouring procedure. However, the difference in carbon content of the furnace numbers is not more than 0.02%; the difference in manganese content is not more than 0.15%. The weight of the mixed lot is no more than 60 t.

9.2.3 Inspection items and sampling quantities

The inspection items and sampling quantities of the bars shall comply with Table 5 and Table 6.

9.2.4 Inspection results

The inspection result of each inspection item shall comply with the provisions of Clause 6 and Clause 7.

9.2.5 Re-inspection and judgement

The re-inspection and judgement of the bars shall comply with the provisions of GB/T 17505. However, the weight deviation item of the bars is not allowed to be re-inspected.

10 Packaging, marking, and certification

10.1 The surface marking of the bars shall comply with the following requirements:

- a) The bars shall be marked with a designation on their surface. The registered factory name (or trademark) and the nominal diameter millimeter number may also be marked in sequence.
- b) Bar designations are indicated by Arabic numerals plus English letters. For example, HRB400a and HRB500a are represented by 4A and 5A, respectively; HRB400aE and HRB500aE are represented by 4AE and 5AE, respectively; HRB400c and HRB500c are represented by 4C and 5C, respectively; HRB400cE and HRB500cE are represented by 4CE and 5CE, respectively. The factory name is indicated by the Chinese pinyin initials. The nominal diameter in millimeters is expressed in Arabic numerals.

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 -----