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

GB 13014-2013

Replacing GB 13014-1991

**Quenching and self-tempering ribbed bars for the
reinforcement of concrete**

钢筋混凝土用余热处理钢筋

(English Translation)

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Foreword

This standard 6.4.1, 7.3.5, 7.4.2, 7.5 Table 3 dimensions a, b, Appendix A are recommended, the rest are mandatory.

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard section instead of GB 13014-1991 "reinforced concrete with heat treated steel." this standard compared with GB 13014-1991, in addition to editorial changes outside the main technical changes are as follows.

--- Modification and increased heat treated steel grades, change the KL400 to RRB400 steel, an increase of RRB500 grades; steel Tendons purpose into weldable and non-weldable;

--- Modify the definition of steel heat treatment;

--- Chapter 5 orders increased content;

--- Increasing the size 50mm steel;

--- 7.4.2 adds reverse bending properties, fatigue properties 7.5, 7.6 connectivity three technical requirements;

--- Modify the nominal diameter 8mm ~ 12mm rebar weight deviation;

--- Modify the "surface shape and size tolerances ribbed steel", "surface quality", "Batch

Rules," "packaging, marking and quality Certificate "and other similar terms;

--- 8.3.5 adds artificial aging process conditions;

--- According to the requirement for increased RRB400, RRB500 chemical composition, mechanical properties and process performance requirements;

--- Added Appendix A "feature heat treatment of steel." the standard proposed by China Iron and Steel Association.

This standard by the National Steel Standardization Technical Committee (SAC/TC183) centralized.

This standard was drafted. Metallurgical Research Institute, Metallurgical Information Standards Institute Group in the construction industry, Jiangsu Shagang Group Co., Ltd., saddle Mountain Iron and Steel Co., Ltd., Fujian Sanming Iron and Steel (Group) Co., Ltd., built by mechanical (Tianjin) Co., Ltd., Tianjin days Rail rolling Two Steel Limited.

1 Scope

This standard specifies the concrete reinforced with heat processing code, size, shape, weight, technical requirements, test methods, inspection regulations Then, packaging, marking and quality certificate.

This standard applies to the reinforcement of concrete surface hardening and self-tempering of steel.

This standard does not apply to finished steel and scrap steel rolled again reinforced.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated edition applies to this file. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 222 chemical composition of finished steel tolerance GB/T 223.5 steel measuring soluble silicon and total silicon content reduced silicon molybdate salt spectrophotometric method Determination of GB/T 223.11 steel and alloy chromium content of visual titration or potentiometric titration GB/T 223.12 Methods for chemical analysis of iron, steel and alloys of sodium carbonate separation - diphenyl hydrazine spectrophotometric determination of chromium content GB/T 223.14 Methods for chemical analysis of iron, steel and alloys, tantalum reagent extraction and spectrophotometric determination of vanadium content GB/T 223.17 steel and alloy chemical analysis method two titanium content determination in methane antipyrine GB/T 223.19 Methods for chemical analysis of iron, steel and alloy neocuproine - chloroform extraction spectrophotometric determination of copper content GB/T 223.23 steel and alloy - Determination of nickel content dimethylglyoxime

spectrophotometry GB/T 223.26 steel and alloy - Determination of molybdenum content - Thiocyanate spectrophotometric GB/T 223.37 Methods for chemical analysis of iron, steel and alloy distillation - indophenol blue photometric method for the determination of nitrogen GB/T 223.40 Determination of steel and alloy niobium content sulphochlorophenol S spectrophotometry GB/T 223.59 Steel and Alloy Determination of phosphorus content by bismuth phosphomolybdate blue spectrophotometric method and antimony phosphomolybdate blue spectrophotometry GB/T 223.63 Methods for chemical analysis of iron, steel and alloy The sodium (potassium) for Determination of amount Determination of sulfur content of potassium iodate titration method after GB/T 223.68 Methods for chemical analysis of iron, steel and alloy tube furnace combustion GB/T 223.69 after carbon and alloy steel - Determination of the pipe furnace combustion gas volumetric method RT Test Method. Test Part 1 GB/T 228.1 metallic materials tensile GB/T 232 metallic materials - Bend test GB 1499.2-2007 Steel for reinforced concrete - Part 2. Hot rolled ribbed bars General provisions GB/T 2101 steel acceptance, packaging, marking and quality certificate GB/T 4336 carbon steel and low alloy steel spark source atomic emission spectrometry method (conventional method) GB/T 4340.1 metallic materials - Vickers hardness test - Part 1. Test methods GB/T 17505 Steel and steel products General technical delivery requirements GB/T 20066 Steel and iron - Sampling and determination of the chemical composition of the sample with a sample preparation method Steel Test methods GB/T 28900 for reinforced concrete Determining rounding and detection values YB/T 081 standard metallurgical technical value YB/T 5126 reinforced concrete steel bending and reverse bending test method

3 Terms and Definitions

GB 1499.2 define the following terms and definitions apply to this document.

Reinforced concrete with heat treated steel

quenching and self-tempering ribbed steel bars for the reinforcement of concrete by heat treatment after hot surface controlled cooling principle, and use their own core heat tempering complete the resulting finished steel.

Quenching a ring on its base circle of self-tempering organization.

4 Classification, designation

4.1

Reinforced concrete reinforced with heat treated according to the yield strength characteristic values into 400, 500, use is divided into weldable and non-weldable.

4.2

Composition and meaning reinforced grades are shown in Table 1.

NOTE: 4.1 weldable refers to the procedure specified in the welding flash butt welding and arc

welding and other processes.

Table 1

Category Grade Grade English letters constituting meaning Heat treated steel RRB400 RRB500 Yield strength specified by the RRB Eigenvalues constitute RRB400W Yield strength specified by the RRB Eigenvalues constitute weldable RRB --- heat treated tendons abbreviation, W --- welding abbreviation

5 Order contents

Contract in accordance with this standard orders shall include at least the following.

- a) number of this standard;
- b) the product name;
- c) steel grades;
- d) reinforced nominal diameter, length (or disc diameter) and weight (or quantity, or disc weight);
- e) special requirements.

6.1 Nominal diameter range and recommended diameter

Reinforced nominal diameter in the range of 8mm ~ 50mm, RRB400, RRB500 recommended reinforced nominal diameter of 8mm, 10mm, 12mm, 16mm, 20mm, 25mm, 32mm, 40mm, 50mm, RRB400W reinforced preferred diameter of 8mm, 10mm, 12mm, 16mm, 20mm, 25mm, 32mm, 40mm.

6.2 Nominal cross-sectional area of the theoretical weight

Reinforced nominal cross-sectional area and the theoretical weight set forth in Table 2.

Table 2

Nominal diameter/mm	nominal cross-sectional area/mm ²	theoretical weight/(kg/m)
20	50.27	78.54
22	113.1	153.9
25	201.1	254.5
28	314.2	380.1
32	490.9	615.8
36	804.2	0.395
40	0.617	0.888
45	1.21	1.58
50	2.00	2.47
55	2.98	3.85
60	4.83	6.31
65	7.99	9.87
70	15.42	

NOTE: theoretical weight calculated density of 7.85g/cm³.

Surface shape and dimensions 6.3 ribbed steel tolerance 6.3.1 ribbed steel horizontal rib design principles should meet the following requirements.

- a) the angle beta axis transverse ribs and steel of not less than 45 °, when the angle is not more than 70 °, reinforced transverse ribs on opposite sides of a direction should in contrast.