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

GB/T 28417-2023

Replacing GB/T 28417-2012

Carbon bearing steel

碳素轴承钢

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Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents". This document replaces GB/T 28417-2012 "Carbon bearing steel". Compared with GB/T 28417-2012, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) ADD the classification (see Clause 4);
- b) MODIFY the requirements for dimensions and shape (see 6.2 of this document, 4.2 of the 2012 edition);
- c) ADD the requirements for weight (see 6.3 of this document);
- d) MODIFY the chemical composition (see 7.1 of this document, 5.1 of the 2012 edition);
- e) ADD the requirements for mechanical properties (see

7.4 of this document);

f) DELETE the requirement for macrostructure rating according to ASTM standards (see 5.4.3 of the 2012 edition);

1 Scope

China's national standard for carbon bearing steel. It specifies the classification, the ordering information, the dimensions, shape and weight, the technical requirements, the test methods, the inspection rules and the packaging, marking and quality certificate for the carbon steels used to make rolling bearing components. Most bearings are made from a high carbon chromium steel, and that steel has its own standard. Carbon bearing steel is the cheaper alternative: a plain high carbon steel, without the chromium, used for the bearings where the loads and the required life do not justify the alloy - the very large numbers of small bearings in domestic appliances, hand tools, bicycles, agricultural equipment and the low duty positions in a machine. The economics are what the standard is for. A bearing steel is bought on cleanness rather than on strength, because a rolling contact fails from a subsurface inclusion long before the material yields, and the difference in cleanness between a bearing steel and an ordinary carbon steel of the same composition is the whole product. So the requirements are the chemical composition with tight residual limits, the non-metallic inclusion rating, the macrostructure, the decarburisation depth, the microstructure and the hardness. The 2023 revision adds a classification clause, adds requirements for weight and for mechanical properties, revises the dimensions, the shape and the chemical composition, tightens the acceptable level of non-metallic inclusions, and deletes the macrostructure rating carried out according to ASTM standards - replacing a foreign reference with a domestic requirement. An informative annex compares the designations in this document with foreign designations, which is what a purchaser needs when matching an imported specification. Issued on 27 November 2023 and in force since 1 June 2024, it replaces GB/T 28417-2012.

This document specifies the classification, ordering content, dimensions, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of carbon bearing steel. This document applies to hot-rolled steel bars (hereinafter referred to as steel bars) with a nominal diameter of 20 mm ~ 150 mm for manufacturing automobile hub bearing units. Steel bars for other purposes can refer to this document.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

GB/T 223.9 Iron, steel and alloy - Determination of aluminium content - Chrom azurol S photometric 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 223.18 Methods for chemical analysis of iron, steel and alloy - The sodium thiosulfate separation iodimetric 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 223.29 Iron, steel and alloy - Determination of lead content - Carrier precipitation-xylene orange spectrophotometric method

GB/T 223.31 Iron, steel and alloy - Determination of arsenic content - Distillation-molybdenum blue spectrophotometric method

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

GB/T 6394 Determination of estimating the average grain size of metal

GB/T 8170-2008 Rules of rounding off for numerical values & expression and judgement of limiting values

GB/T 10561 Determination of content of nonmetallic inclusions in steel - Micrographic method using standard diagrams

GB/T 11261 Steel and iron - Determination of oxygen content - The pulse heating inert gas fusion-infra-red absorption method

3 Terms and definitions

There are no terms or definitions to be defined in this document.

4 Classification

Steel bars are classified into the following two categories according to metallurgical quality:

- a) High-quality steel;
- b) High-grade high-quality steel (with "A" added after the designation).

5 Ordering content

The contract or order for ordering according to this document shall include the following contents:

- a) serial number of this document;
- c) product name;
- d) specification;
- e) weight (or quantity);
- f) delivery status;
- g) special requirements.

6.1 Dimensions

6.1.1 Dimensions and allowable deviations The dimensions and allowable deviations of steel bars shall comply with the provisions of Group 2 in GB/T 702-2017. Upon request of the purchaser, after negotiation between the supplier and purchaser and indicated in the contract, steel bars with other dimensions and allowable deviations can be provided.

6.1.2 Length

6.1.2.1 The usual length of steel bars is 4000 mm ~ 9000 mm.

6.1.2.2 Steel bars shall be delivered in full length within the specified length range, and the difference between the longest and shortest steel bars in each bundle shall not exceed 1500 mm.

6.1.2.3 The length tolerance of steel bars delivered in fixed length or multiple lengths is 50 0 mm.

6.2 Appearance

6.2.1 Out-of-roundness The out-of-roundness of steel bars shall comply with the provisions of GB/T 702-2017. Upon request of the purchaser, after negotiation between the supplier and purchaser and indicated in the contract, steel bars with other out-of-roundness can be provided.

6.2.2 Curvature The curvature of steel bars shall comply with the provisions of Group 2 in GB/T 702- 2017. Upon request of the purchaser, after negotiation between the supplier and purchaser and indicated in the contract, steel bars with other curvatures can be provided.