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

GB/T 1221-2007

Replacing GB 1221-1992

Heat-resistant steel bars

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1 Scope

GB/T 1221-2007 is the Chinese national standard on heat-resistant steel bars, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 14 May 2007 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 December 2007. Classification: ICS 77.140.20, CCS H40. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the size, shape, technical requirements, test methods, acceptance rules, packing marks, certificate of quality and other contents of heat-resistant steel rods (the general name of round steel, square steel, flat steel and hexagonal steel, hereinafter referred to as steel rods). This Standard is applicable to hot-rolled, forged steel rods with size (diameter, side length, thickness or opposite side distance, hereinafter referred to as size) of not more than 250mm; or cold-processing rods with size of not more than 120mm. After negotiation between the supplier and the purchaser, the hot-rolled, forged steel rods with size more than 250mm, and the cold-processing steel rods with size of more than 120 mm can also be supplied.

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 222 Allowable Deviation for Chemical Components of Finished Steel Products

GB/T 223.3 Methods for Chemical Analysis of Iron, Steel and Alloy - Diantipyrylmethane Phosphomolybdate Acid Gravimetric Method for the Determination of Phosphorus Content

GB/T 223.4 Methods for Chemical Analysis of Iron, Steel and Alloy - Ammonium Nitrate Oxidation Volumetric Method for the Determination of Manganese Content

GB/T 223.5 Methods for Chemical Analysis of Iron, Steel and Alloy - Reduction Type Molybdosilicate Spectrophotometry for the Determination of Acid-Soluble Silicon Content

GB/T 223.8 Methods for Chemical Analysis of Iron, Steel and Alloy - Sodium Fluoride Separation - EDTA Titrimetric Method for the Determination of Aluminum Content

3 Terms and Definitions

The terms and definitions established in GB/T 20878 and GB/T 15574 standard are applicable to this Standard.

4 Order Content

According to the order contract of this Standard or order form, it shall include the following contents.

5 Classification

5.1 Steel rods can be classified into four types. austenitic type, ferritic type, martensitic type and precipitation hardening type according to their structural characteristics.

5.2 According to the different processing methods in use, the steel rods can be divided into the following two categories.

6.1 Size, shape and allowable deviation of hot-rolled round steel and square steel

6.2 Size, shape and allowable deviation of hot-rolled flat steel The size, shape and allowable deviation of hot-rolled flat steel shall be in accordance with the provisions of GB/T 704-1988, and the specific requirements shall be specified in the contract.

6.3 Size, shape and allowable deviation of hot-rolled hexagonal steel

6.5 Size, shape and allowable deviation of forged flat steel The size, shape and allowable deviation of forged flat steel shall be in accordance with the provisions of GB/T 16761-1997, and the specific requirements shall be specified in the contract.

6.6.1 Size and allowable deviation

6.7 Weight Steel rods shall be delivered according to actual weight.

7.1 Designation and chemical component

7.2 Smelting method Unless otherwise specified in the contract, primary steelmaking (molten steel) plus external refining and other processes are used generally.

7.3 Delivery state The steel rods can be delivered in heat treatment or non-heat treatment state. When ordering, the delivery state can be selected with reference to Subclauses 7.3.1~ 7.3.5, and it shall be specified in the contract.

7.3.1 Solution treatment or annealing treatment is conducted to austenitic steel rods for cutting processing. It is allowed not to conduct treatment upon negotiation between the supplier and the purchaser.

7.3.2 Annealing treatment is conducted for ferritic steel rods, and it is allowed not to conduct treatment upon negotiation between the supplier and the purchaser.

7.4 Mechanical property

7.4.1 The heat treatment system of all kinds of steel rods or samples is shown in Tables A.1 ~ A.4 in Annex A. The size of the sample blank for heat treatment is generally 25 mm. When the size of steel rods is less than 25 mm, heat treatment is conducted with the steel rods in original size.

7.4.2 The steel rods after heat treatment (except martensitic steel annealing), the samples are no longer conducted with heat treatment; and their mechanical property shall comply

with the provisions of Tables 8~11, respectively.

7.4.3 The mechanical property of steel rods without heat treatment and sample blank after heat treatment shall comply with the provisions of Tables 8 ~11.

7.5 Macrostructure

7.5.1 No visible shrinkage cavity, bubble, crack, inclusion, skin patch and white spot are allowed on the acid pickling macrostructure test piece of cross section of steel rods. The steel rods for cutting processing is allowed to have a depth of not more than half of the nominal size tolerance.

7.5.2 The qualification grade of acid pickling macrostructure shall comply with the provisions of Table

12. When the purchaser asks for Group 1, it shall be specified in the contract. For the steel rods whose size are more than 200 mm, the qualification grade of its macrostructure is determined by the supplier and the purchaser through negotiation.

7.6 Hot top forging

7.6.1 Hot top forging steel (specified in the contract) shall be conducted with the hot top forging test. The height of the sample after hot top forging is 1/3 of the height of original sample. There shall be no gaps or cracks on the samples after the top forging.

7.6.2 The steel rods whose size are more than 80 mm cannot be tested if the supplier can guarantee the qualification of the top forging test.

7.7 Surface quality

7.8 Special requirements According to the requirements of the purchaser, and after the agreement between the supplier and the purchaser, we can supply the steel rods meeting the following special requirements.

8 Test Method

The inspection items and test methods for each batch of steel rods shall comply with the provisions of Table 15.

9 Inspection Rules

9.1 Inspection and acceptance The inspection and acceptance of steel rods shall be conducted by Technical Quality Supervision Department of the supplier.

9.2 Group batching rules The steel rods shall be inspected and accepted in batches. Each batch consists of the steel rods with the same designation, the same furnace number, the