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NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 4226-2009

Replacing GB/T 4226-1984

Cold Finished Stainless Steel Bar

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Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

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Foreword

This Standard replaces GB/T 4226-1984 "Cold Finished Stainless Steel Bar".

Compared with the original standard, this Standard has the following major changes:

- ADD the requirements for "order contents", "classification and code" and "smelting process";
- ADD the peeling and polishing delivery conditions for bright steel bar;
- MODIFY the requirements for dimension, shape and permissible deviation;
- DELETE the original chapter of "category and designation"; directly ADOPT the designations specified in GB/T 1220-2007;
- REVISE "Mechanical property" TO agreed inspection items;
- ADD the macrostructure inspection items;
- ADD the agreed inspection items for "corrosion resistance";
- MODIFY the requirements for "surface quality".

This Standard is proposed by China Iron and Steel Association.

This Standard is under the jurisdiction of the National Technical Committee on Iron and Steel of Standardization Administration of China.

Main drafting organizations of this Standard: Dongbei Special Steel Group Co., Ltd., Metallurgical Information and Standardization Institute, Changzhou Daping New Stainless Steel Products Co., Ltd., Yongxing Special Stainless Steel Co., Ltd..

Main drafters of this Standard: Gu Qiang, Dai Qiang, Luan Yan, Chen Fangda, Zhu Cheng.

The previous edition of the standards replaced by this Standard is as:

- GB/T 4226-1984.

Cold Finished Stainless Steel Bar

1 Scope

This Standard specifies the order contents, classification and code, dimensions, shape, weight and permissible deviation, technical requirements, test methods, inspection rules, packing, marking and quality certificate for the cold finished stainless steel bar (general term of round steel, square steel, hexagonal steel and flat steel, hereinafter referred to as steel bar).

This Standard is applicable to the cold-rolled or cold-drawn round steel, square steel, hexagonal steel, flat steel and bright round steel (peeling, burnishing and polishing) whose dimensions (diameter, side length, distance or width of opposite side, hereinafter referred to as dimension) are not greater than 100mm.

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 Permissible Tolerances for Chemical Composition of Steel Products

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

GB/T 223.4 Alloyed Steel - Determination of Manganese Content - Potentiometric or Visual Titration Method

GB/T 223.5 Steel and Iron - Determination of Acid-soluble Silicon and Total Silicon Content - Reduced Molybdosilicate Spectrophotometric Method

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

GB/T 223.9 Methods for Chemical Analysis of Iron, Steel and Alloy - The Chrom Azurol S Photometric Method for the Determination of Aluminium Content

GB/T 223.11 Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Persulfate Oxidation Volumetric Method for the Determination of Chromium Content

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

GB/T 223.16 Methods for Chemical Analysis of Iron, Steel and Alloy - The Chromotropic Acid Photometric Method for the Determination of Titanium Content

GB/T 223.17 Methods for Chemical Analysisof Iron, Steel and Alloy - The Diantipyrylmethane Photometric Method for the Determination of Titanium 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 223.25 Methods for Chemical Analysisof Iron, Steel and Alloy - The Dimethylglyoxime Gravimetric Method for the Determination of Nickel Content

GB/T 223.26 Iron Steel and Alloy - Determination of Molybdenum Content - The Thiocyanate Spectrophotometric Method

GB/T 223.28 Methods for Chemical Analysis of Iron Steel and Alloy - The D-denzoinoxime Gravimetric Method for the Determination of Molybdenum Content

GB/T 223.36 Methods for Chemical Analysis of Iron, Steel and Alloy - The neutral Titration Method for the Determination of Nitrogen Content after Distillation Separation

GB/T 223.37 Methods for Chemical Analysis of Iron, Steel and Alloy - The Indophenols Blue Photometric Methods 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 223.52 Methods for Chemical Analysis of Iron, Steel and Alloy - The Hydroxylamine Hydrochloride-iodometric Method for the Determination of Selenium Content

GB/T 223.58 Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Arsenite-sodium Nitrite Titrimetric Method for the Determination of Manganese Content

GB/T 223.59 Methods for Chemical Analysis of Iron, Steel and Alloy - The Reduced Molybdoantimonyl Phosphoric Acid Photometric Method for the Determination of Phosphorus Content

GB/T 223.60 Methods for Chemical Analysis of Iron, Steel and Alloy - The Perchloric Acid Dehydration Gravimetric Method for the Determination of Silicon Content

GB/T 223.61 Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Phosphomolybdate Volumetric Method for the Determination of Phosphorus Content

GB/T 223.62 Methods for Chemical Analysis of Iron, Steel and Alloy - The Butyl Acetate Extraction Photometric Method for the Determination of Phosphorus Content

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 223.64 Iron Steel and Alloy - Determination of Manganese Content - Flame Atomic Absorption Spectrometric Method

GB/T 223.67 Iron Steel and Alloy - Determination of Sulfur Content - Methylene Blue Spectrophotometric Method

GB/T 223.68 "Methods for Chemical Analysis of Iron, Steel and Alloy-The Potassium Iodate Titration Method after Combustion in the Pipe Furnace for the Determination of Sulfur Content"

GB/T 223.69 Methods for Chemical Analysis of Iron, Steel and Alloy - The Volumetric Method after Combustion in the Pipe Furnace for the Determination of Carbon Content

GB/T 223.71 Methods for Chemical Analysis of Iron, Steel and Alloy The Gravimetric Method after Combustion in the Pipe Furnace for the Determination of Carbon Content

GB/T 223.72 Iron steel and alloy - Determination of sulfur content - Gravimetric method

GB/T 226 Etch Test for Macrostructure and Defect of Steels (GB/T 226-1991, neq ISO 4969:1980)

GB/T 228 Metallic Materials - Tensile Testing at Ambient Temperature (GB/T 228-2002, eqv ISO 6892:1998)

GB/T 229 Metallic materials - Charpy Pendulum Impact Test Method (GB/T 229-2007, ISO 148-1:2006, MOD)

GB/T 230.1 Metallic materials-Rockwell hardness test - Part 1: Test method (Scales A, B, C, D, E, F, G, H, K, N, T) (GB/T 230.1-2008, ISO 6508:2005, MOD)

GB/T 231.1 Metallic Materials - Brinell Hardness Test - Part 1: Test Method

GB/T 905-1994 Dimension, Shape, Weight and Tolerance for Cold-drawn Round, Square and Hexagonal Steels

GB/T 1220-2007 Stainless Steel Bars

GB/T 1979 Standard Diagrams for Macrostructure and Defect of Structural Steels

GB/T 2101 General Requirement of Acceptance Packaging, Marking and Certification for Section Steel

GB/T 2975 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing (GB/T 2975-1 998, eqv ISO 377: 1997)

GB/T 3207 Bright Steel

GB/T 4334 Corrosion of Metals and Alloys - Test Methods for Intergranular Corrosion of Stainless Steels

GB/T 4340.1 Metallic Materials-Vickers Hardness Test - Part 1: Test Methods (GB/T 4340.1-2008, ISO 6507-1:1997, MOD)

GB/T 6394 Metal-methods for Estimating the Average Grain Size

GB/T 6401-1986 Micrographic Method for Determining Area Fraction of the Alpha-phases Using Charts in Ferritic-Austenitic Stainless Steels

GB/T 7736 Ultrasonic Inspecting Method for Macro-structure and Imperfection of Steel

GB/T 9971-2004 Pure Iron for Raw Material

GB/T 10121 Steel Products-Method for Magnetic Particle Inspection of Tower Sample

GB/T 10561 Steel - Determination of Content of Nonmetallic Inclusions - Micrographic Method Using Standards Diagrams (GB/T 10561-2005, ISO 4967:1998, IDT)

GB/T 11170 Method for Photoelectric Emission Spectroscopic Analysis of Stainless Steel

GB/T 13305-1991 Austenitic Stainless Steels-Determination of Area Content of the a-phase - Micrographic Method using Standard Diagrams

GB/T 15574 Steel Products Classification and Definitions (GB/T 15574-1995, eqv ISO 6929:1987)

GB/T 15711 Steel Products - Method for Etch Test of Tower Sample

GB/T 17505 Steel and Steel Products: General Technical Delivery Requirements (GB/T 17505-1998, eqv ISO 404:1992)

GB/T 20066 Steel and Iron - Sampling and Preparation of Samples for the Determination of Chemical Composition (GB/T 20066-2006, ISO 14284:1996, IDT)

YB/T 5293 Metallic Materials - Forging Test

3 Order Contents

The contract or order ordering according to this standard shall cover:

a) Standard number;

b) Product name (see 4.2);

c) Designation or unified numerical code;

d) Section shape (round, square, flat, hexagonal, etc.);

e) Dimension, shape and precision grade (see Chapter 5);

f) Weight (or quantity);

g) The processing method adopted (see 4.1);

h) Delivery condition (see 6.3);

i) Specific requirements (see 6.8).

4 Classification and Code Number

4.1 Steels shall be classified into the following two types according to the different application and processing methods. The application and processing method of steel bars shall be noted in the contract and the unnoted one shall be supplied as the steels used for machining.

a) Steels used for press working UP

1) Hot press processing UHP

2) Cold press processing UCP

3) Steel for hot upsetting UHF

4) Steel for cold upsetting UCF

b) Steel for machining UC

4.2 The steel bar is classified into the following three types according to the manufacturing operation method.

a) Cold-rolled steel bar WCR

b) Cold-drawn steel bar WCD

c) Bright steel bar

1) Peeling steel bar SF

2) Burnishing steel bar SP

3) Polishing steel bar SB

5 Dimensions, Shape, Weight and Permissible Deviations

5.1 Nominal dimension of steel bar

5.1.1 Nominal dimension of round steel, square steel and hexagonal steel is according to those specified in Table 1.

Table 1 Nominal Dimensions of Round Steel, Square Steel and Hexagonal

6.1 Designation and chemical composition

6.1.1 Designation, unified numerical code and chemical composition (melting analysis) of steel shall meet the requirements of Table 1~Table 5 in GB/T 1220-2007.

6.1.2 The permissible variation of chemical composition of the steel bar shall meet the provisions of GB/T 222.

6.2 Smelting process

Unless otherwise stated in the contract, the process of rough steelmaking (water) plus external refining shall be adopted generally.

6.3 Delivery condition

The round steel bar is delivered in a cold-rolled, cold-drawn or bright (peeling, burnishing and polishing) state; the hexagonal steel and flat steel are delivered in a cold-rolled and cold-drawn state. As required by the demander, they may be delivered through heat treatment and acid cleaning.

6.4 Mechanical property

As required by the demander and noted in the contract, the steel bar may be subjected to the mechanical properties inspection and the specific index is determined through negotiation between the supplier and the demander.

6.5 Corrosion resistance

As required by the demander and noted in the contract, the austenitic and austenite-ferrite stainless steel may be subjected to intergranular corrosion test with an appropriate test methods determined through negotiation between the supplier and the demander and their corrosion resistance is detailed in Table 4 and Table 5. The corrosion resistance of those not specified in Table 4 and Table 5 is determined through negotiation between the supplier and the demander.

As for the cold-rolled or cold-drawn square steel, flat steel and hexagonal steel, their surface quality follows the requirements of 6.7.1.2.

6.7.3 Bright steel

Surface quality of bright steel shall meet the requirements of GB/T 3207.

6.8 Specific requirements

As required by the demander and agreed by the supplier and the demander, the steel bars with the following special requirements are supplied.

a) Hardness inspection is increased;

b) a-phase content is inspected;

c) Nonmetallic inclusion of steel is inspected;

d) Grain size of steel is inspected;

e) Upset test is added;

f) Tower inspection is added;

g) Other special requirements.

7 Test Method

Test items and test methods of each batch of steel bars shall be in accordance with those specified in Table 7.

8 Inspection Rules

8.1 Inspection and acceptance

The inspection and acceptance of steel bar shall be carried out by the technical quality supervision department of the supplier.

8.2 Batching rules

The steel bar shall be inspected and accepted on the batch basis. Each batch consists of steel bars of the same designation, furnace number, processing method, dimension and delivery condition (the same thermal treatment furnace number). If the steel is smelt by electroslag re-melting, the delivery may be finished using parent smelting furnace number of the consumable electrode as a batch on condition that the process is stable and each technical requirement in this standard is guaranteed and this shall be noted in the quality certificate.

8.3 Sampling position & quantity

Sampling position and quantity for inspection of each batch of steel bar shall be in accordance with those specified in Table 7.

8.4 Re-inspection and judgment rules

8.4.1 Re-inspection and judgment rule shall be in accordance with the relevant requirements of GB/T 17505.

8.4.2 If the supplier could ensure that the steels are qualified, as for the inspection results on mechanical properties, macrostructure and nonmetallic inclusions of steel bar or steel billet of the same furnace number, it is allowed to replace inspection results of steels with billets and small ones with large ones.

9 Packing, Marking and Quality Certificate

9.1 The packing, marking and quality certificate of cold-drawn or cold-rolled steel bar shall meet the relevant requirements of GB/T 2101.

9.2 The packing, marking and quality certificate of bright steel bar shall be in accordance with those specified in GB/T 3207.

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