GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.65

H 49

GB/T 4240-2019

Replacing GB/T 4240-2009

Stainless Steel Wires

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Issued on: June 04, 2019 **Implemented on: January 01, 2020**

Issued by: State Administration for Market Regulation;
Standardization Administration of PRC.

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 4240-2009 Stainless Steel Wires.

Compared with GB/T 4240-2009, this Standard has the major technical changes as follows:

--- The structural category has been expanded from three categories in the original standard to four categories; add “austenite-ferrite type” (see Tables 1 and 3 of this Edition; Tables 1 and 3 of 2009 Edition);

--- Tighten the allowable deviation of the steel wire size (see 6.2 of this Edition; 6.2 of 2009 Edition);

--- Tighten the allowable deviation of the steel wire length (see 6.6 of this Edition; 6.6 of 2009 Edition);

--- Add the chemical composition and relevant requirements for 6 designations such as O7Cr19Ni10, 06Cr18Ni11Ti, 022Cr23Ni5Mo3N, 026Cr24, 06Cr13, 14Cr17Ni2; delete the relevant requirements and the designation of 21Cr17Ni2 (see Tables 1, 3, 4, 5, 6 of this Edition; and Tables 1, 3, 4, 5, 6 of 2009 Edition);

--- Supplement the mechanical properties of some designations for the soft state of steel wire (see Table 4 of this Edition; Table 4 of 2009 Edition);

--- Modify the requirements for the surface condition of the steel wire (see 7.2.3 of this Edition; 7.2.3 of 2009 Edition);

--- Add technical requirements and methods for intergranular corrosion test of austenitic stainless-steel wire (see 7.5.2 and Table 7 of this Edition);

--- Add comparison of different designations of this Standard (see Appendix A).

This Standard was proposed by China Iron and Steel Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel (SAC/TC 183).

Drafting organizations of this Standard: Dongbei Special Steel Group Co., Ltd.; Zhejiang Tenglong Stainless Steel Products Co., Ltd.; Jiangsu Fasten Hongsheng Stainless Steel Products Co., Ltd.; Jiangsu Shenyuan Group Co., Ltd.; Jiangsu Xinghuo Special Steel Co., Ltd.; Zhejiang Tsingshan Iron & Steel Co., Ltd.; Nantong Songcheng Industrial Co., Ltd.; and China Metallurgical Information and Standardization Institute.

Stainless Steel Wires

1 Scope

This Standard specifies the terms and definitions, ordering contents, classification and designation, dimension, shape, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of stainless-steel wires.

This Standard is applicable to the stainless-steel wire (hereinafter referred to as steel wire), but excluding the stainless-steel wire for cold top forging and welding; excluding the austenitic and precipitation hardening spring stainless-steel wire.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

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

GB/T 223.4 Iron, Steel and Alloy - Determination of Manganese Content - Potentiometric or Visual Titration Method

GB/T 223.9 Iron, Steel and Alloy - Determination of Aluminum Content – Chrome Azurol S Photometric Method

GB/T 223.11 Iron, Steel and Alloy - Determination of Chromium Content - Visual Titration or Potentiometric Titration Method

GB/T 223.17 Methods for Chemical Analysis of 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 Cupper Content

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

GB/T 223.25 Methods for Chemical Analysis of 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

GB/T 3207-2008 Bright Steel

GB/T 4334-2008 Corrosion of Metals and Alloys - Test Methods for Intergranular Corrosion of Stainless Steels

GB/T 4356 Stainless Steel Wire Rods

GB/T 11170 Stainless Steel - Determination of Multi-Element Contents - Spark Discharge Atomic Emission Spectrometric Method (Routine Method)

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 (Routine Method)

GB/T 20878 Stainless and Heat-Resisting Steels - Designation and Chemical Composition

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Delivery status

3.1.1 Soft

The steel wire is subjected to bright heat-treatment, or pickled or taken similar treatment after heat treatment to remove the surface oxide scale.

3.1.2 Lightly drawn

After heat treatment, the steel wire is drawn to the finished product dimension with a small area reduction ratio.

3.1.3 Cold drawn

After heat treatment, the steel wire is performed the conventional drawing; that is, the forming process by pressure processing methods such as die drawing and roll drawing at normal temperature.

3.2 Surface status

provisions of GB/T 2103-2008.

9.2 Batching rules

The steel wires shall be inspected and accepted in batches. Each batch consists of the steel wires with the same designation, the same furnace number, the same size, and the same delivery status.

9.3 Sampling quantity and sampling position

The sampling quantity and sampling position of the steel wires shall conform to the provisions of Table 7.

9.4 Reinspection and judgment rules

The reinspection and judgement rules of the steel wires shall conform to the provisions of GB/T 2103-2008. When the test results of the mechanical property are unqualified, the two ends of the steel wire coil shall be removed for a certain length and then double samples shall be taken for reinspection; the results shall conform to the provisions of this Standard. Even if one of the specimens in the reinspection results is unqualified, then such batch shall be judged to be unqualified. Inspection can also be taken on a disc-by-disc basis; only those qualified can be delivered.

Table 7 – Inspection Items, Sampling Quantity, Sampling Position and Test Methods of Steel Wire

S/N	Inspection items	Sampling quantity [a]	Sampling position	Test methods
1	Chemical composition	1 piece/furnace	As per provisions of GB/T 20066	GB/T 223.4, GB/T 223.9, GB/T 223.11, GB/T 223.17, GB/T 223.18, GB/T 223.23, GB/T 223.25, GB/T 223.26, GB/T 223.28, GB/T 223.36, GB/T 223.37, GB/T 223.40, GB/T 223.59, GB/T 223.60, GB/T 223.61, GB/T 223.64, GB/T 223.72, GB/T 223.86, GB/T 11170, GB/T 20123, GB/T 20124
2	Tensile test	3 pieces	One end on different disc (piece)	GB/T 228.1 If nominal size of the steel wire is ≤ 1.5mm, then gauge for elongation after break is L=50mm. If nominal size of steel wire is >1.5mm, the gauge for elongation after break is L=100mm.
3	Intergranular corrosion	2 pieces	One end on different disc (piece)	As agreed [b]

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