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

GB/T 4240-2019

Stainless steel wires

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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 07Cr19Ni10, 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

1 Scope

China's national standard for stainless steel wire. It specifies the terms and definitions, the order content, the dimensions and tolerances, the technical requirements, the test methods and the inspection rules. Stainless wire covers an unusually wide range of products from one specification: spring wire, cold heading wire for fasteners, welding wire, weaving wire for screens and filters, rope wire, and the fine wire of surgical and dental use. What they share is that the wire is drawn, and drawing hardens austenitic stainless steel rapidly - a grade that arrives soft and ductile becomes hard and springy after a few passes, which is how stainless spring wire is made without heat treatment. That work hardening is also why the delivery condition has to be specified as carefully as the grade: the same composition supplied annealed, half hard or spring temper is three different materials to the customer's machine.

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 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 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 Thiocyanate Spectrophotometric Method

GB/T 223.28 Methods for Chemical Analysis of Iron, Steel and Alloy - The alpha-Benzoinoxime 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 Indophenol Blue Photometric Method for the Determination of Nitrogen Content after Distillation Separation

GB/T 223.40 Methods for Chemical Analysis of Iron, Steel and Alloy - The Anion- Exchange Separation - Sulphochlorophenol S Photometric Method for the Determination of Niobium Content

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.

3.2 Surface status

3.2.1 Gray After the dry drawing and heat treatment, the surface of the steel wire is dull.

3.2.2 Bright After wet drawing and heat treatment, the surface of the steel wire is bright.

3.2.3 Cleanliness After the drawing and heat treatment, the surface of the steel wire is clean.

3.2.4 Coating The surface of the steel wire is coated or plated.

4 Ordering Contents

The contract and ordering list for ordering shall include the following contents.

- a) This Standard number;
- b) The name of the product;

5 Classification, Designation and Code

The steel wires are divided into 4 categories according to the structure; its category, designation, delivery status and code can refer to Table 1.

6 Dimension and Shape

6.1 The nominal size range of the soft steel wire is 0.05mm~16.0mm; the nominal size range of the lightly drawn steel wire is 0.30mm~16.0mm; while the nominal size range of the cold drawn steel wire is 0.10mm~12.0mm.

6.2 The allowable deviation of the steel wire size shall conform to the provisions of Level-11 in Table 2 of GB/T 342-2017.

6.3 The out-of-roundness of the round steel wire shall be no greater than half of the diameter tolerance.

6.4 The steel wires shall be delivered in coils, spools, tightly wound layers with or without mandrels, and container package. The coil and densely packed layer winding shall be regular; when unpacked the coils, the steel wires shall not be scattered, twisted, tangled or knotted, etc.

6.5 The inner diameter of the steel wire shall conform to the provisions of Table 2. When the purchaser has special requirements for the diameter of the coil, it shall be determined