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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.15

H 48

GB/T 3089-2020

Replacing GB/T 3089-2008

Seamless Ultra-Thin Wall Stainless Steel Tubes

不锈钢极薄壁无缝钢管

Issued on: April 28, 2020

Implemented on: November 01, 2020

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

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Seamless Ultra-Thin Wall Stainless Steel Tubes

1 Scope

This Standard specifies the ordering content, size, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of seamless ultra-thin wall stainless-steel tubes.

This Standard is applicable to spinning or cold-rolled (drawn) seamless ultra-thin wall stainless-steel tubes (hereinafter referred to as steel tubes).

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 223.11 Iron, Steel and Alloy - Determination of Chromium Content - Visual Titration or Potentiometric Titration 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 223.28 Methods for Chemical Analysis of Iron, Steel and Alloy - The α -Benzoinoxime Gravimetric Method for the Determination of Molybdenum Content

GB/T 223.59 Iron, Steel and Alloy - Determination of Phosphorus Content - Bismuth Phosphomolybdate Blue Spectrophotometric Method and Antimony Phosphomolybdate Blue Spectrophotometric Method

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 223.63 Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium (Potassium) Periodate Photometric Method for the Determination of Manganese Content

GB/T 223.84 Steel and Iron - Determination of Titanium Content -

Diantipyrylmethane Spectrophotometric Method

GB/T 223.85 Steel and Iron - Determination of Sulfur Content - Infrared Absorption Method after Combustion in an Induction Furnace

GB/T 223.86 Steel and Iron - Determination of Total Carbon Content - Infrared Absorption Method after Combustion in an Induction Furnace

GB/T 228.1 Metallic Materials - Tensile Testing - Part 1: Method of Test at Room Temperature

GB/T 2102 Acceptance Packing Marking and Quality Certification of Steel Pipe

GB/T 2975 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing

GB/T 4334-2020 Corrosion of Metals and Alloys - Test Methods for Intergranular Corrosion of Austenitic and Ferritic-Austenitic (Duplex) Stainless Steels

GB/T 10561-2005 Steel - Determination of Content of Nonmetallic Inclusions - Micrographic Method Using Standards Diagrams

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)

3 Ordering Content

The contract and ordering list that order products according to this Standard shall include the following contents:

- a) This Standard number;
- b) Product name;
- c) Steel designation;
- d) Size and specification;
- e) Ordering quantity (total weight or total length or the number of pieces);

5.5.2 The tube blanks of 06Cr17Ni12Mo2Ti and 06Cr18Ni11Ti designations shall be inspected for nitride [TiN, Ti(N, C)]; and TiN and Ti(N, C) inclusions that appear in the same field of view shall be evaluated together. The nitrides in a chain distribution are represented by E₁, and the evaluation shall be graded according to the distribution pattern of GB/T10561-2005 with reference to the category B inclusion pattern classification. The nitrides with irregular (dispersed) distribution are represented by E₂, and the evaluation shall be graded according to the distribution pattern of GB/T10561-2005 with reference to the category D inclusion pattern classification. Classes E₁ and E₂ inclusions are reported separately. The grades of Classes E₁ and E₂ nitrides shall conform to the provisions of Table 7.

Table 7 – Nitrides

Class	Class E ₁ (chain distribution)	Class E ₂ (dispersed distribution)
Grade	≤ 2.0	≤ 3.0

5.6 Intergranular corrosion

Steel tubes delivered in heat-treated state shall be subjected to intergranular corrosion test in accordance with the provisions of Method E in GB/T 4334-2020. After the test, the sample shall not show any tendency to intergranular corrosion.

5.7 Surface quality

5.7.1 There should be no cracks, folds, rolling-folds, delamination, scars, scaly thorns, plaques, as well as scratches, pits and indentations with depth exceeding the lower deviation of the wall thickness on the inner and outer surfaces of the steel tube. Slight spiral corrugations, wire marks and non-damaging concave surfaces are allowed to exist.

5.7.2 The surface roughness R_a of the steel tube shall be no greater than 1.6μm.

6 Test Methods

6.1 Sampling for the analysis of chemical composition of steel tube shall be conducted according to rules of GB/T 20066. The analysis of chemical composition is usually carried out according to GB/T 11170, GB/T 20123 or other general methods. When arbitrating, it shall be carried out according to the provisions of GB/T 223.11, GB/T 223.25, GB/T 223.28, GB/T223.59, GB/T223.60, GB/T223.63, GB/T 223.84, GB/T 223.85, GB/T 223.86.

6.2 The size and shape of the steel tube shall be measured one by one with a measuring tool that meets the accuracy requirements.

6.3 The inner and outer surfaces of steel tubes shall be visually inspected one by one

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