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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 13314-2025

Replacing GB/T 13314-2008

Forged steel work rolls for cold rolling - General technical specifications

锻钢冷轧工作辊 通用技术条件

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1 Scope

GB/T 13314-2025 is the Chinese national standard on forged steel work rolls for cold rolling - general technical specifications, 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 29 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2026. Classification: ICS 77.180, CCS H94. 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 document specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of forged alloy steel work rolls for cold-rolled metals. This document applies to monobloc forged alloy steel cold-rolled work rolls and intermediate rolls (hereinafter referred to as the cold rolls) used in cold rolling mills for metal sheets and strips. Cold rolls manufactured by other methods may also refer to this document.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date,

only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 223 (all parts) Methods for Chemical Analysis of Iron, Steel and Alloy

GB/T 226 Test Method for Macrostructure and Defect of Steel by Etching

GB/T 1184-1996 Geometrical Tolerancing - Geometrical Tolerance for Features without Individual Tolerance Indications

GB/T 1299 Tool and Mould Steels

GB/T 1804-2000 General Tolerances - Tolerances for Linear and Angular Dimensions without Individual Tolerance Indications

GB/T 1979 Evaluation of Macrostructural Defects in Structural Steels - Acid Etching Method and Ultrasonic Testing Method

GB/T 4879-2016 Rustproof Packaging

GB/T 9445 Non-destructive Testing - Qualification and Certification of Personnels

GB/T 10561-2023 Determination of Content of Nonmetallic Inclusions in Steel - Micrographic Method Using Standard Diagrams

GB/T 13313 Methods of Shore and Leeb Hardness Testing for Rolls

GB/T 15546 Terms of Mill Rolls

GB/T 15547 Blanks of Forged Steel Rolls for Cold Rolling Mill

GB/T 18254-2016 High-carbon Chromium Bearing Steel

3 Terms, Definitions and Abbreviations

The terms and definitions defined in GB/T 15546 are applicable to this document.

4 Technical Requirements

4.1 General Requirements The cold rolls shall conform to this document and the drawings, agreements, etc., agreed upon by both the supply-side and the demand-side.

4.2 Designations and Chemical Compositions

4.2.1 The designations and chemical compositions of the steel used for cold rolls shall conform to the provisions of Table

1.Other designations or chemical compositions agreed upon by both the supply-side and the demand-side may also be used. The permissible deviation of the chemical compositions

of the roll blanks or finished product analysis shall conform to the provisions of GB/T 15547.

4.2.2 The impurities in the chemical compositions, Pb, Sn, As, Sb and Bi, shall all be 0.02%.

4.3 Smelting Methods

4.3.1 The smelting method for the steel used for the cold rolls should preferably be an intermediate frequency furnace or electric furnace (converter) + ladle refining + vacuum degassing + electroslag remelting method. Other methods agreed upon by both the supply-side and the demand-side may also be used. The specific smelting method shall be specified in the contract or technical agreement.

4.3.2 The cold rolls shall be forged from electroslag remelted ingots, with a roll barrel forging ratio 3.

4.6 Surface Quality of Cold Rolls

4.6.1 The surfaces of the roll barrel and roll neck of the cold rolls shall be free from cracks, visible pits, non-metallic inclusions, porosity, and other surface defects that affect their use.

4.6.2 The surface roughness of the roll barrel and roll neck of the cold rolls shall conform to the provisions of the drawings. Roughness Ra not specified on the drawings shall generally be 1.6.

4.7 Geometric Tolerances and Dimensional Tolerances The geometric tolerances and dimensional tolerances of the cold rolls shall conform to the provisions of the drawings. Dimensional tolerances of the roll barrel not specified on the drawings shall comply with Grade m in GB/T 1804-2000.The roll barrel is generally manufactured in a cylindrical shape; cylindricity tolerances not specified shall comply with Grade K in GB/T 1184-1996.If other shapes are required, they shall be determined through negotiation between the supply-side and the demand-side.

5 Test Methods

5.1 Chemical composition analysis methods shall comply with the provisions of GB/T 223 (all parts).

5.2 Chemical composition deviation shall comply with the provisions of GB/T 15547.

5.3 The macrostructure shall comply with the provisions of GB/T 226 and evaluated in accordance with the first-level diagram of GB/T 1299; spot segregation and general porosity shall comply with the provisions of GB/T 1979.

5.4 Non-metallic inclusions shall comply with the provisions of GB/T 10561-2023.

5.5 Carbide banding and liquid precipitation shall comply with the provisions of GB/T

18254- 2016.

5.6 Network carbide testing shall be performed in accordance with the provisions of GB/T 1299.

5.7 Pearlite spheroidization testing shall be performed in accordance with the provisions of GB/T 1299.

5.8 Ultrasonic flaw detection shall be performed in accordance with the provisions of Appendix A.

5.9 Hardness test shall generally be performed using a Shore or Leeb hardness tester, and the test method shall comply with the provisions of GB/T 13313.

5.10 The depth of the hardened layer of the roll barrel of the cold rolls shall be tested by grinding the roll barrel layer by layer to determine the surface Shore hardness value, or by determining the surface Shore hardness value during the regrinding process by the user.

5.11 Surface cracks on the roll barrel of the cold rolls shall be inspected using ultrasonic surface wave testing and comply with the provisions of GB/T 23904.

6 Inspection Rules

6.1 The manufacturer's quality inspection department shall conduct inspections in accordance with this document and the agreement between the supply-side and the demand-side.

6.2 The dimensions and surface quality of each part shall be inspected piece by piece.

6.3 Chemical composition shall be sampled and inspected during the pouring of each heat of molten steel. If the analysis result is disqualified, it is allowed to conduct sampling from the cold roll body for a re-inspection; if the re-inspection result is qualified, it is considered qualified.

6.4 For macrostructure, a test piece shall be taken from the roll neck corresponding to the head (riser end) of the ingot for each heat number of base material of the electric furnace. For microstructure testing, the specimen shall be taken from 1/3 of the radius of the near-surface macrostructure test piece. The inspection shall comply with the provisions of GB/T 15547.

6.5 Ultrasonic flaw detection and ultrasonic surface wave testing shall be performed on each roll.

6.6 Surface hardness, roll barrel hardness uniformity, and soft zone width shall be inspected on each roll.

6.7 The depth of the hardened layer of the roll barrel is guaranteed by the manufacturer's process and can be determined by dissecting and testing representative test rolls of the