

Translated English of Chinese Standard: GB/T1504-2024

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 77.180

CCS H 94

GB/T 1504-2024

Replacing GB/T 1504-2008

Cast Iron Rolls

铸铁轧辊

Issued on: March 15, 2024

Implemented on: October 1, 2024

Issued by: State Administration for Market Regulation;

Standardization Administration of the People's Republic of China.

Table of Contents

Foreword	3
1 Scope.....	5
2 Normative References.....	5
3 Terms and Definitions.....	7
4 Technical Requirements	7
5 Test Methods	15
6 Inspection Rules.....	16
7 Marking, Packaging and Quality Certificate	17
Appendix A (normative) Inspection of Roll Neck Structure of Ductile Cast Iron Rolls and Ball Core Composite Rolls.....	18
Appendix B (normative) Ultrasonic Testing Method for Cast Iron Rolls.....	22

Cast Iron Rolls

1 Scope

This document specifies the technical requirements, test methods, inspection rules, marking, packaging and quality certificates for cast iron rolls.

This document applies to cast iron rolls used in metal material processing and composite rolls (including roll rings) with the working layer made of cast iron.

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 145 Center Holes

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 Diantipyryl Methane Phosphomolybdate Gravimetric Method for the Determination of Phosphorus Content

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

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

GB/T 223.13 Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Ferrous Sulfate Titration Method for the Determination of Vanadium 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 α -benzoinoxime Gravimetric Method for the Determination of Molybdenum Content

3 Terms and Definitions

The terms and definitions defined in GB/T 12604.1 and GB/T 15546, and the following are applicable to this document.

3.1 outer layer thickness

The thickness of the same material of the working layer of the composite roll.

3.2 single defect

At the specified sensitivity, the spacing between adjacent defects is greater than 8 times the equivalent of the larger defect.

NOTE: the spacing between defects is determined by the center position of the probe at the peak of the defect echo.

3.3 concentrated defect

At the specified sensitivity, the spacing between adjacent defects is less than or equal to 8 times the equivalent of the larger defect.

NOTE: the indication area of concentrated defect is determined by the specified sensitivity as the boundary.

3.4 backwall echo attenuation zone

The area where the radial back wave is attenuated to less than 10% f.s due to internal defects of the roll.

4 Technical Requirements

4.1 General Requirements

4.1.1 Manufactured in accordance with this document and the purposes of the roll and the order drawings and technical agreements confirmed by the supply-side and the demand-side.

4.1.2 Technical requirements other than this document shall be determined by negotiation between the supply-side and the demand-side.

4.2 Chemical Composition and Surface Hardness

4.2.1 The chemical composition and surface hardness of the outer layer shall comply with the provisions of Table 1.

4.2.2 The core of the centrifugally cast composite roll should be made of high-strength ductile cast iron, or high-strength steel.

5 Test Methods

5.1 Chemical composition analysis shall be carried out in accordance with the provisions of relevant standards in Table 8, and GB/T 223.79 or GB/T 14203. During arbitration, the relevant standards in Table 8 shall be used. The allowable deviation of the chemical composition of finished products shall be implemented in accordance with the provisions of GB/T 222.

5.2 Hardness test shall be carried out in accordance with the provisions of GB/T 13313.

5.3 The test of mechanical properties shall be carried out in accordance with the provisions of GB/T 228.1.

5.4 When the core is made of ductile cast iron, the metallographic structure inspection shall be carried out in accordance with the provisions of Appendix A.

5.5 Ultrasonic testing of cast iron rolls shall be carried out in accordance with the provisions of Appendix B.

6 Inspection Rules

6.1 The chemical composition shall be inspected furnace by furnace in accordance with the smelting furnace, and the specimen shall be taken from the ladle before pouring. When the chemical composition analysis is disqualified, sampling can be carried out on the working layer of the roll for two re-inspections, and as long as it passes the re-inspection once, the result is qualified.

6.2 The surface hardness of the roll body and roll neck shall be tested one by one, and the number and position of the measurement points shall comply with the provisions of GB/T 13313.

6.3 The chill depth of the chilled cast iron rolls shall be checked and determined by the distance between the first batch of gray spots on the end face of the roll body and the delivery roll surface. The number of gray spots to be measured shall be no less than 3 within a 10 mm wide range along the radius tangent direction of the end face of the roll body.

6.4 The roll neck structure of the cast iron rolls shall be inspected in accordance with the proportion specified in the contract. The inspection position of the ductile cast iron rolls is the roll neck surface on the transmission side, and the inspection position of the ball core composite rolls is the roll neck surface on the operating side.

6.5 The surface quality, main dimensions and surface roughness shall be inspected one by one.

6.6 Ultrasonic testing shall be carried out on centrifugal composite cast iron rolls one by one, and ultrasonic testing of other rolls shall be determined by negotiation between the supply-side and the demand-side.

7 Marking, Packaging and Quality Certificate

7.1 After the finished product is qualified in the inspection, the manufacturer's logo and roll No. shall be engraved on the end face of the roll neck on the transmission side. If the demand-side has specific requirements for the roll logo, it can be indicated in the order drawings or agreement.

7.2 Before packaging, the key parts of the roll surface shall be protected with rust-proof materials; the packaging should take into account the safety of the rolls during transportation and hoisting, prevent damage and rust during transportation, and meet the requirement of no rust within 6 months of indoor storage.

7.3 The packaged rolls shall be placed flat in a dry and ventilated indoor environment.

7.4 The rolls shall be accompanied by a quality certificate filled in by the quality inspection department when exiting the factory, including:

- a) Name of the supply-side;
- b) Name of the demand-side;
- c) Serial No. of this document;
- d) Contract No., product No., roll No.;
- e) Product specifications;
- f) Material code, chemical composition range, hardness, ultrasonic testing results, roll weight, production date;
- g) Heat treatment status shall be indicated when blank exits the factory.

Appendix A

(normative)

Inspection of Roll Neck Structure of Ductile Cast Iron Rolls and Ball Core Composite Rolls

A.1 Method

Use optical metallographic microscope to inspect the roll neck microstructure of ductile cast iron rolls and composite rolls with ductile cast iron core and rate it.

A.2 Specimen Preparation

A.2.1 The metallographic specimen of the roll neck is cut at the end of the roll neck base, or it can be directly inspected at the designated inspection position on the roll neck surface.

A.2.2 When cutting and preparing the specimen, it shall not be over-heated or over-burned. When grinding and polishing, it shall be ensured that the original microstructure is not destroyed. The surface of the specimen shall be smooth and there shall be no obvious scratches or visual defects.

A.2.3 When preparing the specimen containing graphite, the graphite shall not be peeled, contaminated or deformed.

A.3 Inspection Requirements

A.3.1 The inspection position is determined in accordance with the inspection requirements. The inspection for rating shall be carried out at a position 5 mm ~ 15 mm away from the surface on the specimen.

A.3.2 Microstructure inspection includes graphite, carbide and ferrite structure inspection.

A.3.3 During microstructure inspection, the inspected range shall be generally observed first, and then, a representative field of view shall be selected to report the results.

A.3.4 Graphite inspection is carried out directly after polishing, with a magnification of 50 times; carbide and ferrite structure inspection is carried out after polishing and etching with 3% ~ 5% nitric acid alcohol, with a magnification of 100 times.

A.4 Inspection and Rating

A.4.1 Roll neck graphite morphology

The roll neck graphite morphology is divided into 5 types, see Table A.1 and Figure A.1 ~ Figure A.5.

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----