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

GB/T 32959-2016

**High-Carbon Chromium Bearing Steel for Large Forged Bars
(English Translation)**

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Foreword

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

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 Beiman Special Steel Co., Ltd., China Metallurgical Information and Standardization Institute, Wafangdian Bearing Company Limited, and Central Iron and Steel Research Institute.
Chief drafting staffs of this Standard. Qian Chengyun, Yan Chengming, Zhou Yantian, and Yu Feng.

High-Carbon Chromium Bearing Steel for Large
Forged Bars

1 Scope

This Standard specifies the booking contents, dimension, shape, weight, technical requirements, test methods, inspection rules, as well as package, marks and quality certificate of the high-carbon chromium bearing steel for large forged bars.

This Standard is applicable to high-carbon chromium bearing steel for forged bars

(hereinafter referred to as steel) with nominal diameter of 400mm ~ 1000mm, and used for producing the bearing ring.

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 223.5 Steel and Iron - Determination of Acid-Soluble Silicon and Total Silicon Content - Reduced Molybdosilicate Spectrophotometric Method

GB/T 223.9 Iron Steel and Alloy - Determination of Aluminium Content - Chrom Azurol S Photometric Method

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

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

GB/T 223.26 Iron, Steel and Alloy - Determination of Molybdenum Content - The Thiocyanate Spectrophotometric Method

GB/T 223.29 Iron Steel and Alloy - Determination of Lead Content - Carrier Precipitation-Xylenol Orange Spectrophotometric Method

GB/T 223.31 Iron Steel and Alloy - Determination of Arsenic Content -Distillation-Molybdenum Blue Spectrophotometric Method

GB/T 223.47 Method for Chemical Analysis of Iron, Steel and Alloy- the Carrier Precipitation - Molybdenum Blue Photometric Method for the Determination of Antimony Content

GB/T 223.50 Methods for Chemical Analysis of Iron, Steel and Alloy - the Phenylfluorone - CTMAB Direct Photometric Method for the Determination of Tin Content

GB/T 223.53 Methods for Chemical Analysis of Iron, Steel and Alloy - the Flame

Atomic Absorption Spectrophotometric Method for the Determination of Copper
Content

GB/T 223.62 Methods for Chemical Analysis of Iron, Steel and Alloy - the Butyl
Acetate Extraction Photometric Method for the Determination of Phosphorus
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 223.77 Methods for Chemical Analysis of Iron, Steel and Alloy - the Flame
Atomic Absorption Spectrometric Method for the Determination of Calcium
Content

GB/T 223.82 Steel and Iron - Determination of Hydrogen Content - Inert Gas
Impulse Fusion Heat Conductivity Method

GB/T 223.84 Steel, Iron and Alloy - Determination of Titanium Content -
Dianipyrylmethane Spectrophotometric Method

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

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

GB/T 224-2008 Determination of Depth of Decarburization of Steels

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

GB/T 231.1 Metallic Materials - Brinell Hardness Test - Part 1. Test Method

GB/T 1979 Standard Diagrams for Macrostructure and Defect of Structural Steels

GB/T 4336 Carbon and Low-Alloy Steel - Determination of Multi-Element Contents
-Spark Discharge Atomic Emission Spectrometric Method (Routine Method)

GB/T 6402 Steel Forgings - Method for Ultrasonic Testing

allowed to exist.

6.1 Dimension, Shape

The measurement of steel dimension shall take the caliper or template whose necessary precision shall be ensured.

6.2 Chemical compositions

The chemical analysis method shall be performed as per GB/T 223.5, GB/T 223.9, GB/T 223.11, GB/T 223.23, GB/T 223.26, GB/T 223.29, GB/T 223.31, GB/T 223.47, GB/T 223.50, GB/T 223.53, GB/T 223.62, GB/T 223.63, GB/T 223.77, GB/T 223.82, GB/T 223.84, GB/T 223.85, GB/T 223.86, GB/T 4336, GB/T 11261, GB/T 20123, GB/T 20125, and other general methods; arbitration shall be performed as per GB/T 223.5, GB/T 223.9, GB/T 223.11, GB/T 223.23, GB/T 223.26, GB/T 223.29, GB/T 223.31, GB/T 223.47, GB/T 223.50, GB/T 223.53, GB/T 223.62, GB/T 223.63, GB/T 223.77, GB/T 223.82, GB/T 223.84, GB/T 223.85, GB/T 223.86, or GB/T 11261, GB/T 20125.

6.3 Hardness

The Brinell Hardness test method shall conform to the provisions of GB/T 231.1.

6.4 Macrostructure

The macrostructure acid-dip test method shall be performed as per the provisions of GB/T 226; the assessment method and assessment diagram shall be carried out as per GB/T 1979 and Level 1 ~ Level 4 diagram in Appendix A of GB/T 18254-2016.

6.5 Non-metallic inclusions

Magnify 100 times of non-metallic inclusions to observe after quenching and tempering according to 6.10; the assessment method and assessment diagram shall be performed as per the Method A in GB/T 10561-2005.

6.6.1 The carbide strip test takes longitudinal specimen, which shall perform

quenching and tempering treatment as per 6.10; after polishing, use 4% nitric acid alcohol solution to etch, magnify the specimen for 100 times and 500 times; assess the carbide aggregation degree, size and shape as per the Level-8 diagram in