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

**中华人民共和国国家标准**

GB/T 5216-2014

Replace GB/T 5216-2004

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**Structural steels with specified hardenability  
bands**

**保证淬透性结构钢**

**Issued on December 05, 2014**

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**Issued by General Administration of Quality Supervision, Inspection  
and Quarantine of the People's Republic of China**

**Standardization Administration of the People's Republic of  
China**

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## Foreword

This Standard is drafted according to the rules specified in GB/T 1.1-2009

This Standard will replace GB/T 5216-2004 Structural steels subject to end-quench hardenability requirements.

Comparison with GB/T 5216-2004, main changes of this Standard are as follows:

- Left out the restriction that “diameter or thickness is not less than 30 mm” from the scope of this standard;
- Cancelled “steel is divided into high-quality steel and high-grade fine steel according to metallurgical quality” in classification and symbol;
- Increased designations to 32 from 24 (excluding sulphur bearing steel), adding related technical requirements and such 8 symbols as 25CrH, 28CrH, 35CrMoH, 17Cr2Ni2H, 22CrNiMoH, 27CrNiMoH, 40CrNi2MoH and 18Cr2Ni2MoH;
- Adjusted the upper and lower limits of the compositions of some designations in Table 1: The lower limit of boron content in boron bearing steel is changed to 0.0008%, and its ceiling is unified to 0.0035%; the manganese carbon in 17CrMnBH steel is rectified to 1.40% from 1.3%; the ceiling of manganese content in 20CrMnTiH steel is adjusted to 1.2% from 1.15%, and the ceiling of chromium content in 20CrMnTiH steel to 1.45% from 1.35%; the lower limit of sulfur content in sulfur bearing steel is changed to 0.015% from 0.02%; the carbon content in 15CrMoH steel ranges from 0.12% to 0.18%;
- Unified the content requirements of impurities like sulfur and phosphorus as well as residual elements such as copper, chromium and nickel;
- Increased the requirement that oxygen content in steel is not greater than 0.002%;
- Supplemented hardness requirements for 16CrMnH and 20CrMnH steel after annealing or high tempering;
- Added the provision that “the steel whose nominal diameter or thickness is

less than 30mm can be measured by sampling in the intermediate billet” in Section 6.5.1;

- Changed the method for the representation of hardenability bands;
- Specified in group the requirements for macrostructure in Table 3, and added the requirements for the “center segregation” of continuous casting steel;
- Specified in group the requirements for non-metallic inclusions in Table 4;
- Replace “calculation method for steel hardenability” with “calculation method for the ideal critical diameter D1 of steel” in Annex A.

This Standard is proposed by China Iron and Steel Association

This Standard is under the jurisdiction of National Technical Committee 183 on Iron and Steel of Standardization Administration of China.

Draft units of this Standard: Iron and Steel Research Institute, Jiangyin Xingcheng Special Iron and Steel Co., Ltd, Daye Special Iron and Steel Co., Ltd, Shijiangzhuang Special Iron and Steel Co., Ltd, Northease Special Iron and Steel Co., Ltd, China Metallurgical Information Standardization Institute, Baosteel Special Iron and Steel Co., Ltd, Pangang Group Jiangyou Greetwall Special Iron and Steel Co., Ltd, Suzhou Suxin Special Iron and Steel Co., Ltd and Shougang Group.

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This Standard replaces the following historical editions issued:

- GB 5216-1985;
- GB/T 5216-2004.

# Structural steels with specified hardenability bands

## 1 Scope

This standard specifies the order content, classification, symbol, dimension, shape, weight, allowable deviation, technical requirements, test methods, inspection rules, package, marks and quality certificate of structural bar steel subject to end-quench hardenability.

This standard is applicable to hot-rolled and hot-forged structural steel subject to end-quench hardenability (hereinafter referred to as the steel) for mechanical manufacture. The hardenability of the steel is measured with end-quench method or calculated with a formula.

## 2 Normative references

The articles contained in the following documents have become this document when they are quoted herein. For the dated documents so quoted, all the modifications (Including all corrections) or revisions made thereafter shall be applicable to this document.

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 diantipyrylmethane 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 223.14 Methods for chemical analysis of iron, steel and alloy — The N-benzoyl-N-phenylhydroxylamine extraction photometric method for the determination of vanadium content



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