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PEOPLE'S REPUBLIC OF CHINA

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**Extra-high strength structural steel plates  
in the heat-treatment condition**

超高强度结构用热处理钢板

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## Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by the China Iron and Steel Association.

This standard shall be under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC 183).

Drafting organizations of this standard: Jinan Iron & Steel Group Co., Ltd., Anshan Iron & Steel Co., Ltd., Hunan Hualing Xiangtan Iron & Steel Co., Ltd., Metallurgical Industry Information Standards Institute, Shougang Corporation.

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# **Extra-high strength structural steel plates in the heat-treatment condition**

## **1 Scope**

This standard specifies the ordering content, designation indication method, size, shape, weight and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of extra-high strength structural steel plates in the heat-treatment condition.

This standard is applicable to steel plates with a thickness of not more than 50 mm for construction machinery such as mines, buildings and agriculture.

## **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 standard.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 223.3 Methods for chemical analysis of steels and alloys - Determination of phosphorus content by diantipyryl methane phosphomolybdate gravimetric method

GB/T 223.9 Iron steel and alloy - Determination of aluminum 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 223.12 Methods for chemical analysis of iron, steel and alloy - The sodium carbonate separation-diphenyl carbazide photometric method for the determination of chromium content

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

sulfur content

GB/T 223.69 Iron, steel and alloy - Determination of carbon contents - Gas-volumetric method after combustion in the pipe furnace

GB/T 223.71 Methods for chemical analysis of iron, steel and alloy - The gravimetric method after combustion in the pipe furnace for the determination of carbon content

GB/T 223.72 Iron, steel and alloy - Determination of sulfur content - Gravimetric method

GB/T 223.75 Iron steel and alloy - Determination of boron content - Methanol distillation-curcumin photometric method

GB/T 223.76 Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrometric method for the determination of vanadium content

GB/T 223.78 Methods for chemical analysis of iron, steel and alloy - Curcumin spectrophotometric method for the determination of boron content

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 229 Metallic materials - Charpy pendulum impact test method

GB/T 247 General rule of package mark and certification for steel plates (sheets) and strips

GB/T 709 Dimension, shape, weight and tolerances for hot rolled sheets and strips

GB/T 2970 Thicker steel plates - Method for ultrasonic inspection

GB/T 2975 Steel and steel products - Location and preparation of test pieces for mechanical testing

GB/T 4336 Carbon and low-alloy steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (routine method)

GB/T 14977 General requirement for surface condition of hot-rolled steel plates

GB/T 17505 Steel and steel products - General technical delivery requirements

GB/T 20066 Steel and iron - Sampling and preparation of samples for the

of removal shall be calculated from the actual size of the steel plate, it shall not exceed half of the thickness tolerance of the steel plate, meanwhile it shall ensure the minimum thickness of the steel plate. The defect removal area shall be smooth and free of edges and corners.

**6.5.2** The surface of the steel plate is allowed to have a thin-layer of iron oxide scale, rust, surface roughness caused by the falling of the iron oxide scale, scratches, indentations or other local defects, that do not hinder the inspection of surface defects, but the depth shall not exceed half of the thickness tolerance, meanwhile it shall ensure the minimum thickness of the steel plate.

**6.5.3** Steel plates are not allowed to weld-repair.

**6.5.4** Except for the provisions on weld-repair, through negotiation between the supplier and the purchaser and as indicated in the contract, the surface quality shall comply with the provisions of GB/T 14977.

## 6.6 Ultrasonic testing

If required by the manufacturer, the steel plate can be ultrasonically tested piece by piece, the test method shall follow the provisions of GB/T 2970. Through negotiation between the supplier and the purchaser, it may also use other testing criteria, the specific testing criteria and qualification grade shall be indicated in the contract.

**6.7** Through negotiation between the supplier and the purchaser, it may put forward to other special requirements for the steel plate.

## 7 Test methods

The inspection items, sampling quantities, sampling methods and test methods of the steel plates shall comply with the requirements of Table 4.

**Table 4**

| No. | Inspection item      | Sampling quantity / piece | Sampling method | Test methods                                            |
|-----|----------------------|---------------------------|-----------------|---------------------------------------------------------|
| 1   | Chemical composition | 1 / furnace               | GB/T 20066      | GB/T 223, GB/T 4336, GB/T 20123, GB/T 20125, GB/T 20126 |
| 2   | Tension              | 1 / batch                 | GB/T 2975       | GB/T 228.1                                              |
| 3   | Impact               | 3 / batch                 | GB/T 2975       | GB/T 229                                                |
| 4   | Size, shape          | Piece by piece            | -               | Measuring tool complying with accuracy requirements     |
| 5   | Surface              | Piece by piece            | -               | Visual inspection                                       |
| 6   | Ultrasonic testing   | Piece by piece            | -               | GB/T 2970                                               |

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