

ICS 77.140.50
CCS H46



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

GB/T 4238-2015

Heat-resisting steel plate, sheet and strip

耐热钢钢板和钢带

Issued on: September 11, 2015

Implemented on: June 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Order content
- 4 Dimensions, shape, weight and allowable deviation
- 5 Technical requirements
 - 5.2 Chemical composition
 - 5.6 Surface processing type
- 6 Test methods
- 7 Inspection rules
- 8 Packing, marking and quality certificate

Foreword

This Standard is drafted according to the rules given in GB/T 1.1-2009. This Standard replaces GB/T 4238-2007 "Heat-resisting steel plate, sheet and strip". Compared with GB/T 4238-2007, the main technical changes are as follows: - ADD six steel grades and related technical requirements; - ADJUST the chemical composition of the 5 grades and the mechanical properties of 6 grades; - CHANGE the elongation after fracture of the steel plate, sheet and strip with the thickness not more than 3 mm FROM A TO A50 mm; - CANCEL the requirement of "when the 16Cr25Ni20Si2 steel plate's thickness is greater than 25 mm, the mechanical properties are for reference only"; - REVISE the reinspection and determination rules; - ADD the mechanical properties and rules of rounding off for chemical composition test results; - ADD the determination rules of the grain size of some steel grades; - ADJUST the solid solution treatment temperature of 4 grades in Annex C; - COMPLEMENT the characteristics and uses in Annex B; - ADD the informative Annex C, comparing table of heat-resisting steel grades in different countries. This Standard is proposed by China Iron and Steel Association. The Standard is under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183). Main drafting organizations of this Standard. Shanxi Taigang Stainless Steel Co., Ltd., Baosteel Stainless Steel Co., Ltd., Metallurgical Industry Information Standards Institute. Main drafters of this Standard. Li Guoping, Ren Yongxiu, Xu Zhongjie, Dong Li, Wang Chuandong, Zhang Weixu, Zhang Jianjun. The previous version of the standards replaced by this Standard are as follows: - GB/T 4238-1984, GB/T 4238-1992, GB/T 4238-2007; - GB/T 4239-1984, GB/T 4239-1991. Heat-resisting steel plate, sheet and strip

1 Scope

China's national standard for heat-resisting steel plate, sheet and strip. It specifies the order content, the dimensions, shape, weight and tolerances, the technical requirements, the test methods, the inspection rules and the marking. Heat-resisting steels are the grades that keep useful strength and resist oxidation at temperatures where ordinary steel scales away - the austenitic and ferritic stainless compositions with raised chromium, silicon and aluminium, and the nickel-rich grades beyond them. They go into furnace parts, radiant tubes, heat treatment fixtures, boiler and petrochemical internals and exhaust systems. The property that governs their selection is not strength but the behaviour of the oxide they form: a scale that is adherent and self-healing protects the metal indefinitely, and one that spalls on cooling exposes fresh surface at every thermal cycle, so a grade adequate at constant temperature can be consumed rapidly by cycling.

This Standard specifies the order content, dimension, shape, weight and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking and quality certificates of heat-resisting steel plates, sheets and strips. This Standard applies to hot-rolled and cold-rolled heat-resisting steel plates, sheets and strips.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies 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 223.4 Alloyed steel - Determination of manganese content - Potentiometric or visual titration method

GB/T 223.5 Steel and iron - Determination of acid-soluble silicon and total silicon content - Reduced molybdosilicate spectrophotometric method

GB/T 223.8 Methods for chemical analysis of iron, steel and alloy - The sodium fluoride separation-EDTA titration method for the determination of aluminium content

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

3 Order content

The contract or order according to this Standard shall include the following contents.

4 Dimensions, shape, weight and allowable deviation

The dimension, shape, weight and allowable deviation of cold-rolled steel plate, sheet and strip shall comply with the specifications of GB/T 3280.

5 Technical requirements

5.1 Smelting method Steel shall adopt the primary smelting of molten steel and furnace refining process.

5.2 Chemical composition

5.2.1 The grade, classification and chemical composition (melting analysis) of steels shall comply with the specifications in Tables 1 to

4. See Annex A for heat-resisting steel grades in different countries. See Annex B for characteristics and uses of heat-resisting steels.

5.4.5 The mechanical properties of annealed martensitic heat-resisting steel plates, sheets and strips shall comply with the specifications in Table 7.

5.6 Surface processing type

5.6.1 The surface processing type of cold-rolled heat-resisting steel plates, sheets and strips shall comply with the specifications of GB/T 3280.

5.6.2 The surface processing type of hot-rolled heat-resisting steel plates, sheets and strips shall comply with the specifications of GB/T 4237.

5.7 Surface quality Stratification is not allowed on steel plates, sheets and strips; flaws such as cracks, air bubbles, inclusions, knots, etc. that may be harmful to uses are not allowed on the surface; it shall comply with the specifications of GB/T 3280 and GB/T 4237.

5.8 Special requirements According to the requirements of the demand party, there may be special requirements for steels' chemical composition, mechanical properties, non-metallic inclusions and high temperature performance, or supplement specifications of non-destructive test, etc.; the specific content shall be determined through the consultation of supply and demand parties.

6 Test methods

6.1 The test method for steels' chemical composition shall comply with the specifications in

GB/T 223.3, GB/T 223.4, GB/T 223.5, GB/T 223.8, GB/T 223.9, GB/T 223.11, GB/T 223.16, GB/T 223.18, GB/T 223.19, GB/T 223.23, GB/T 223.25, GB/T 223.26, GB/T 223.28, GB/T 223.33, GB/T 223.36, GB/T 223.40, GB/T 223.43, GB/T 223.53, GB/T 223.58, GB/T 223.60, GB/T 223.61, GB/T 223.68, GB/T 223.69, GB/T 11170, GB/T 20123 and GB/T 20124.

6.2 The inspection items, number of samples, sampling method and position and test method of each batch of steel plates, sheets and strips shall meet the requirements in Table 11.

7 Inspection rules

7.1 Inspection of steel plates, sheets and strips shall be carried out by the quality inspection department of supply parties.

7.2 The mechanical properties of steel plates, sheets and strips used as raw materials of cold rolling shall be inspected only when the demand party requires and indicates in the contract.

7.5 Mechanical properties and chemical composition test results shall adopt rounding off value comparing method; the rounding off rule shall comply with the specifications of GB/T 8170.