GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.50
H 46

GB/T 711-2008

Replacing GB/T 711-1988

Hot-rolled Quality Carbon Structural Steel Plates, Sheets and Wide Strips

Issued on: October 10, 2008 **Implemented on: May 1, 2009**

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 (SAC).

Table of Contents

Foreword

This Standard replaces GB/T 711-1988 "Hot-rolled Quality Carbon Structural Steel Plates, Sheets and Wide Strips".

Compared with GB/T 711-1988, the main changes in this standard are as follows:

- Change the provisions on delivery state;
- The sulfur content is reduced by 0.005%;
- The impact test is changed from transverse direction to longitudinal direction; and the impact absorbed energy value is increased;
- The inspection batch weight is increased to 60t.

This Standard was proposed by China Iron & Steel Association.

This Standard shall be under jurisdiction of China Steel Standardization Technical Committee.

Chief drafting organizations of this Standard: Chongqing Iron & Steel Company Limited, Tianjin Iron & Steel Co., Ltd., Shougang Corporation, Angang Steel Company Limited, and China Metallurgical Information And Standardization Research Institute.

Chief drafting staffs of this Standard: Zhu Bin, Zeng Xiaoping, Yuan Jianhua, Li Shuqing, Du Dasong, Shi Li, Guan Jichun, Su Yan, and Wang Xiaohu.

The previous versions replace by this Standard are as follows:

- GB/T 711-1985, and GB/T 711-1988.

Hot-rolled Quality Carbon Structural Steel Plates, Sheets and Wide Strips

GB/T 711-2008

1. Scope

This Standard specifies the dimension, shape, weight, allowable deviation, technical requirements, test method, test rules, packing, mark, and quality certificate of hot-rolled quality carbon structural steel plates, sheets and wide strips.

This Standard is applicable to the hot-rolled quality carbon structural steel plates, sheets and wide strips of which the thickness is 3mm~60mm and the width is not less than 600mm.

2. Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For dated reference, the subsequent amendments (excluding corrigendum) or revisions of these publications do not apply. However, the parties who enter into agreement based on this Standard are encouraged to study whether the latest editions of these references are applicable. For undated references, the latest edition of the normative document is applicable to this Standard.

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 223.9 "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 223.18 "Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Thiosulfate Separation Iodimetric Method for the Determination of Copper Content"

GB/T 223.19 "Methods for Chemical Analysis of Iron Steel and Alloy - The Neocuproine-chloroform Extraction Photometric Method for the Determination of Copper Content"

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

GB/T 223.36 "Methods for Chemical Analysis of Iron, Steel and Alloy - The Neutral Titration Method for the Determination of Nitrogen Content after Distillation Separation"

GB/T 223.37 "Methods for Chemical Analysis of Iron Steel and Alloy - The Indophenal Blue Photometric Methods for the Determination of Nitrogen Content after Distillation Separation"

GB/T 223.59 "Iron Steel and Alloy - Determination of Phosphorus Content - Bismuth Phosphomolybdate Blue Spectrophotometric Method and Antimony Phosphomolybdate Blue Spectrophotometric Method"

GB/T 223.60 "Methods for Chemical Analysis of Iron, Steel and Alloy - The Perchloric Acid Dehydration Gravimetric Method for the Determination of Silicon Content"

GB/T 223.61 "Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Phosphomolybdate Volumetric Method for the Determination of Phosphorus 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 223.64 "Iron Steel and Alloyed - Determination of Manganese Content - Flame Atomic Absorption Spectrometric Me 223.64thod"

GB/T 223.67 "Iron Steel and Alloy - Determination of Sulfur Content - Methylene Blue Spectrophotometric Method"

GB/T 223.68 " Methods for Chemical Analysis of Iron, steel and Alloy - The

Potassium Iodate Titration Method after Combustion in the Pipe Furnace for the Determination of Sulfur Content"

GB/T 222 "Permissible Tolerances for Chemical Composition of Steel Products"

GB/T 224 "Determination of Depth of Decarburization of Steels"

GB/T 226 "Etch Test for Macrostructure and Defect of Steels"

GB/T 228 "Metallic Materials - Tensile Testing at Ambient Temperature" (GB/T 228-2002.eqv ISO 6892: 1998)

GB/T 229 "Metallic Materials - Charpy Pendulum Impact Test Method" (GB/T 229-2007, ISO 148:2006, MOD)

GB/T 232 "Metallic Materials - Bend Test" (GB/T 232-1999, eqv ISO 7438:1985)

GB/T 247 “General Rule of Acceptance, Package, Mark and Certification for Steel Plates, Sheets and Strips”

GB/T 709 “Dimension, Shape, Weight and Tolerances for Hot Rolled Sheets and Plates”

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 2975-1998, eqv 377: 1997)

GB/T 4336 "Standard Test Method for Spark Discharge Atomic Emission Spectrometric Analysis of Carbon and Low-alloy Steel (routine Method)"

GB/T 17505 "Steel and Steel Products - General Technical Delivery Requirements" (GB/T 17505-1998, eqv ISO 404: 1992)

GB/T 20066 "Steel and Iron - Sampling and Preparation of Samples for the Determination of Chemical Composition" (GB/T 20066-2006, ISO 14284: 1996, IDT)

GB/T 20123 "Steel and Iron - Determination of Total Carbon and Sulfur Content - Infrared Absorption Method after Combustion in an Induction Furnace (routine Method)" (GB/T 20123-2006, ISO 15350: 2000, IDT)

GB/T 20125 "Low-alloy Steel - Determination of Multi-element Contents - Inductively Coupled Plasma Atomic Emission Spectrometric Method"

YB/T 081 "Rule for Rounding off of Numerical Values and Judgment of Testing Values for Technical Standards of Metallurgy"

5.4 Mechanical property

5.4.1 Mechanical property of steel plates (sheets) and steel strips shall comply with requirements in Table 2. Each property of 08Al steel shall comply with requirements of 08 steel plates (sheets) and steel strips; cold bending experiment of No. 08~35 steel shall comply with requirements in Table 3, if the quality can be guaranteed by the supplier, test may be exempted.

5.4.1.1 For steel plate delivered in the heat treatment condition, if the elongation rate is increased more than 2% (absolute value) of Table 2, tensile strength is allowed to be lowered by 40N/mm^2 than the provisions in Table 2.

5.4.1.2 When the thickness of steel plates (sheets) and steel strips is greater than 20mm, if the thickness incremented by 1mm, then the elongation rate can be reduced by 0.25% (absolute value); if the thickness ≤32mm, total reduced value shall not be greater than 2% (absolute value); if the thickness >32mm, total reduced value shall not be greater than 3% (absolute value).

5.4.2 If both parties agree, 20°C or -20°C low-temperature impact test can be proceeded on steel products whose thickness is not less than 6mm; the impact force of 10, 15 and 20 steel plate shall comply with requirements in Table 4; test temperature shall be indicated in the contract. Test temperature and impact absorption energy of other grades shall be agreed by both parties.

energy can be measured; the value can be determined by both parties.

5.4.2.2 For Charpy (V-notch) impact absorption energy, it can be calculated by arithmetic mean of 3 samples; one value of the samples can be lower than the specified value in table 4, but it shall not be less than 70% of specified value.

If the requirements above can not be met, then re-take another 3 samples from the same products to conduct the test, average of the 6 samples shall not be less than the specified value; 2 samples are allowed to be lower than the specified value, however, only one sample is allowed to be less than 70% of specified value.

5.4.2.3 For Charpy (V-notch) impact test on the steel plate whose thickness is less than 12mm, auxiliary samples shall be adopted; for steel plate whose thickness is bigger than 8mm~12mm, the size of auxiliary sample is 7.5mm×10mm×55mm, experimental result shall not be less than 75% of specified value in Table 4; for the steel plate whose thickness is 6mm~8mm, the size of auxiliary sample is 5mm×10mm×55mm, experimental result shall not be less than 50% of specified value in Table 4.

5.5 Macrostructure

Through the mutual agreement of both supplier and purchaser, steel plates (sheets) and steel strips with thickness of greater than 10mm may be inspected with macrostructure; while steel plates (sheets) and steel strips shall be free of megascopic shrinkage cavity, inclusion, crack and stratification. If the supplier can ensure the quality, plate blank may be allowed to replace the steel plate to inspect the macrostructure.

5.6 Decarburized layer

Through the mutual agreement of both supplier and purchaser, 35 steel and steel plates or wide strips with higher carbon content may be tested with decarburized layer; the total decarburized layer depth shall not be greater than 2% of the actual thickness of the steel plates (sheets) and steel strips on each surface.

5.7 Ultrasonic test

Through the mutual agreement of both supplier and purchaser, the steel plates (sheets) and steel strips may be conducted for ultrasonic test; the test method shall comply with the requirements of GB/T 2970; the qualified level shall be indicated in the contract.

5.8 Surface quality

5.8.1 The steel plates (sheets) and steel strips surfaces shall be free of cracks, bubbles, folding, inclusion, or be pressed into iron oxide scale; the steel plate is not allowed to be stratified.

5.8.2 The steel plates (sheets) and steel strips are not allowed to have thin-layer iron

7. Inspection rules

7.1 The quality of the steel plates (sheets) and steel strips shall be inspected and accepted by the quality technical supervision department of the supplier.

7.2 The steel plates (sheets) and steel strips shall be accepted in lots. Each lot is consisted of steel plates (sheets) and steel strips of the same-grade, same-furnace number, same-thickness, same-rolling or heat treatment system; lot weight is not greater than 60t. For wide strips of which the rolling coil weight is greater than 30t AND rolling plates, it may be grouped according to two rolling coils.

7.3 Re-inspection

Steel plates (sheets) and steel strips re-inspection shall comply with the requirements of GB/T 17505.

8. packaging, marking and quality certificate

The packaging, marking and quality certificate of steel plates (sheets) and steel strips shall comply with the relevant provisions of GB/T 247.

9. Rounding-off of numerical value

The rounding-off of numerical value shall comply with provisions of YB/T 081.

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