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Hot Rolled Steel Sections with Improved Weldability

改善焊接性能热轧型钢

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Hot Rolled Steel Sections with Improved Weldability

1 Scope

This Standard specifies the ordering content, classification, grade expression method, dimension, shape, weight and permissible deviation, technical requirements, test methods, inspection rules, package, mark and quality certificate of hot rolled steel sections with improved weldability.

This Standard is applicable to the hot rolled H-shaped steel sections (hereinafter referred to as "H-shaped section steel") with improved weldability produced by quenching and self-tempering process (QST). Other hot rolled steel section can also refer to this Standard.

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 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 223.14 Methods for Chemical Analysis of Iron, Steel and Alloy - The N-Benzoyl-N-Phenylhydroxylamine Extraction Photometric Method for the Determination of Vanadium 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 223.26 Iron, Steel and Alloy - Determination of Molybdenum Content - The Thiocyanate Spectrophotometric Method

GB/T 223.32 Methods for Chemical Analysis of Iron, Steel and Alloy - The Hypophosphite Reduction-Iodimetric Method for the Determination of Arsenic Content

GB/T 223.40 Iron, Steel and Alloy - Determination of Niobium Content by the Sulphochlorophenol S Spectrophotometric Method

GB/T 223.54 Methods for Chemical Analysis of Iron, Steel and Alloy - The Flame Atomic Absorption Spectrophotometric Method for the Determination of Nickel Content

GB/T 223.58 Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Arsenite-Sodium Nitrite Titrimetric Method for the Determination of Manganese Content

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 Alloy - Determination of Manganese Content - Flame Atomic Absorption Spectrometric Method

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 Combustion Potassium Iodate Volumetric Method for the Determination of 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 223.74 Methods for Chemical Analysis of Iron, Steel and Alloy - The Combustion Gravimetric/Gas-Volumetric Method for the Determination of Combined Carbon Content

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 228.1 Metallic Materials - Tensile Testing - Part 1: Method of Test at Room Temperature

GB/T 229 Metallic Materials - Charpy Notch Impact Test

GB/T 2101 General Provisions on Acceptance, Package, Marking and Quality Certificate for Profile Steel

GB/T 2975 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing

GB/T 5313 Steel Plate with Through-Thickness Characteristics

6.6.1 The H-shaped section steel with thickness no less than 6mm shall do the impact test. The impact test specimen size shall be standard one of 10mm × 10mm × 55mm. When it is insufficient to prepare the standard specimen, take small size specimen; if the specimen size is 7.5mm × 10mm × 55mm, then the test result shall be no less than 75% of the specified value; if the specimen size is 5mm × 10mm × 55mm, then the test result shall be no less than 50% of the specified value. However, the larger size specimen shall be preferred.

6.6.2 The Charpy (V-shaped) impact test results for H-shaped section steel shall be based on the arithmetic average of a set of three specimens; thereof, one of the specimen is allowed to be less than the specified value, but no less than 70% of the specified value. If the test results don't meet the above requirements, take another three specimens from the same H-shaped section steel (or from the same billet); the arithmetic average of the six specimens in two groups shall be no less than the specified value; thereof, two specimens are allowed to be less than the specified value; but only one of them less than 70% of specified value is allowed.

6.7 Surface quality

The surface quality of H-shaped section steel shall conform to the provisions of GB/T 11263. Through the negotiation between the supplier and the purchaser, indicated in the contract, the provisions of YB/T 4427 or relevant standard shall be subject to.

6.8 Thickness direction performance

The thickness direction performance shall meet the requirements of GB/T 5313.

6.9 Ultrasonic test

6.9.1 H-shaped section steel with thickness direction performance requirements shall take the ultrasonic test.

6.9.2 Through the negotiation between the supplier and the purchaser, indicated in the contract, other H-shaped section steels can also take the ultrasonic test.

6.9.3 Ultrasonic test can be performed against the section steel according to GB/T 2970 or ASTM A898/A898M or relevant agreement. The test quantity and compliance level shall be indicated in the contract.

6.10 Welding

6.10.1 The welding of H-shaped section steel without preheating shall meet the following conditions.

- a) The hydrogen content in the welding material shall be less than 10mL/100g;
- b) The ambient temperature is greater than 0°C;