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Quenched and tempered high strength steel plates for pressure vessel

压力容器用调质高强度钢板

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Quenched and tempered high strength steel plates for pressure vessel

1 Scope

This Standard specifies the dimensions, shapes, technical requirements, test methods, inspection rules, packaging, marks and quality certificates of quenched and tempered high strength steel plates for pressure vessel.

This Standard is applicable to the quenched and tempered high strength steel plates with thickness of 10mm ~ 60mm for pressure vessel.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 223.11, *Methods for chemical analysis of iron, steel and alloy - Determination of chromium content - Visual titration or potentiometric titration method*

GB/T 223.14, *Methods for chemical analysis of iron, steel and alloy - The N-benzoy-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 iodometric 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*

gravimetric method after combustion in the pipe furnace for the determination of carbon content

GB/T 223.72, *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 223.74, *Methods for chemical analysis of iron, steel and alloy - The combustion gravimetric / gas-volumetric method for the determination of combined carbon content*

GB/T 223.75, *Methods for chemical analysis of iron, steel and alloy - The methanol distillation-curcumin photometric method for the determination of boron 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 228.1-2010, ISO 6892-1:2009, MOD)

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

GB/T 232, *Metallic materials - Bend test*

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

GB/T 709, *Dimensions, shape, weight and tolerances for hot rolled steel sheets and strips*

GB/T 2970, *Thicker steel plate - Method for ultrasonic inspection*

GB/T 2975, *Steel and steel products - Location and preparation of samples and 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 8170, *Rules of rounding off for numerical values & expression and judgement of limiting values*

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

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

taken from the same sample blank. The sample blank shall be taken from 1/4 of the width of the steel plate. When the length of the steel plate after heat treatment is not more than 15 m, the sample blank is cut at one end of the steel plate. When the length of the steel plate after heat treatment is greater than 15 m, a sample blank shall be cut at each end of the steel plate; each sample blank is taken from a set of samples (1 for stretch, 3 for impact and 1 for cold bend). Shearing or flame cutting is allowed to cut the sample blank. However, the size of the sample blank must ensure that the sample avoids the hardened or heat affected zone caused by shearing or flame cutting.

7.3 The axial direction of the tensile, impact and cold bend specimens in Table 3 shall be perpendicular to the rolling direction of the steel sheet. The direction of notch axis of Charpy (V-notch) impact specimen shall be vertical to the rolling surface of the steel plate.

7.4 The sampling positions of tensile, impact tests shall be in accordance with GB/T 2975. For steel plates with a thickness greater than 25 mm, the axis of the impact test specimen shall be at a thickness of 1/4. The cold bend specimens of steel plates with all thicknesses shall at least reserve one rolled surface. The rolled surface is the outer surface of the bend test.

8 Inspection rules

8.1 Steel plate inspection is carried out by the supplier quality inspection department. The purchaser has the right to perform the acceptance according to this Standard.

8.2 The heat treatment of steel plates shall be in inspected and accepted by batches.

8.3 If the steel plate inspection result does not meet the above requirements of this Standard, it can be retested.

8.3.1 If the impact test results do not comply with the provisions of 6.4.1 of this Standard, three more samples shall be taken from the same steel plate for testing. The arithmetic mean of the impact absorption energy of the six samples of the two groups shall not be lower than the specified value. Two samples are allowed to be less than the specified value. However, only one sample with a value less than 70% of the specified value is allowed.

8.3.2 The re-inspection and determination of other inspection items shall be carried out in accordance with the relevant provisions of GB/T 17505.

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