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Medium manganese steel plate for offshore platform structure

海洋平台结构用中锰钢钢板

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Medium manganese steel plate for offshore platform structure

1 Scope

This Standard specifies the designation representation, order content, size, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certificates of medium manganese steel plate for offshore platform structure.

This Standard applies to medium manganese steel plates (hereinafter referred to as steel plates) whose thickness is 20 mm ~ 150 mm for offshore platform structure.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version 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 223.4, Iron, steel and alloy - 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 223.9, Iron, steel and alloy - Determination of aluminium content - Chrome azurol S photometric method

GB/T 223.11, Iron, steel and alloy - Determination of chromium content - Visual titration or potentiometric titration method

GB/T 223.14, 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 223.19, 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 223.37, Methods for chemical analysis of iron, steel and alloy - The indophenol blue photometric methods for the determination of nitrogen content after distillation separation

GB/T 223.40, Iron, steel and alloy - Determination of niobium content by the sulphochlorophenol S spectrophotometric method

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 223.67, Iron, Steel and Alloy - Determination of Sulfur Content - Methylene Blue Spectrophotometric Method

GB/T 223.69, Iron, Steel and Alloy - Determination of Carbon Contents - Gas-volumetric - Method after Combustion in the Pipe Furnace

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

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 709-2019, Dimension shape weight and tolerances for hot-rolled steel plates and sheets

GB/T 2970, Method for ultrasonic testing of thicker steel plates

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 5313, Steel plate with through-thickness characteristics

4 Order content

The contract or order in accordance with this Standard shall include the following information:

a) reference to this Standard;

b) designation;

c) specification;

d) delivery status;

e) weight (quantity);

f) size and shape accuracy;

g) special requirements.

5 Size, shape, weight

5.1 Size, shape and allowable deviation

5.1.1 The size, shape, weight and allowable deviation of the steel plate shall meet the requirements of GB/T 709-2019. The thickness deviation of the steel plate shall comply with the provisions of Grade-B deviation in GB/T 709-2019; the average thickness of the steel plate is not less than the nominal thickness.

5.1.2 By agreement between the supplier and the buyer, steel plates of other sizes, shapes and allowable deviations can be supplied, which shall be specified in the contract.

5.2 Weight

The steel plate is calculated based on the theoretical weight. The thickness that is used for the theoretical weight is the arithmetic average of the maximum thickness and minimum thicknesses that are allowed for the steel plate; the density of the steel is 7.85 g/cm^3.

6 Technical requirements

6.1 Designation and chemical composition

6.1.1 The steel designation and chemical composition (melting analysis) shall comply with the requirements of Table 1.

After the agreement between the supplier and the buyer, the buyer can make other special requirements on the strain aging impact and weldability of the steel plate, which are specified in the contract.

7 Test method

7.1 Chemical composition

The chemical composition analysis of steel shall be carried out according to GB/T 4336, GB/T 20123, GB/T 20124, GB/T 20125 or other general methods; the arbitration shall be carried out according to GB/T 223.4, GB/T 223.5, GB/T 223.9, GB/T 223.11, GB/T 223.14, GB/T 223.19, GB/T 223.23, GB/T 223.26, GB/T 223.37, GB/T 223.40, GB/T 223.62, GB/T 223 .67, GB/T 223.69 and GB/T 223.72.

7.2 Sampling method

7.2.1 Prepare tensile test samples. When the thickness of the steel is not greater than 40 mm, take a full-section rectangular sample, of which the width is 25 mm. When the capacity of the testing machine is insufficient, it can be processed on one rolling surface of the sample to reduce the thickness to 25 mm. When the thickness of the steel is greater than 40 mm, take a circular section sample, the axis of which is located at 1/4 of the thickness of the steel plate or as close to this position as possible; the diameter of the sample is 14 mm; according to the capacity of the testing machine, a full-section sample can be used. For steel plates whose thickness is greater than 100 mm, add 1/2 thickness tensile test; take a circular section sample, the axis of which is located at 1/2 of the steel plate thickness.

7.2.2 Prepare the impact test sample. When the thickness of the steel is less than 40 mm, the impact sample shall be a near-surface sample; the edge of the sample is less than 2 mm from a rolling surface. When the thickness of the steel is not less than 40 mm, the sample axis shall be located at 1/4 thickness of the steel or as close to this position as possible. For steel plates whose thickness is greater than 50 mm, add 1/2 thickness impact test; its axis is located at 1/2 of the steel plate thickness.

7.3 Thickness test

The measurement position of the thickness of the steel plate shall be no less than 10 mm from the side of the steel plate; the measurement position of the thickness of the steel strip shall be no less than 40 mm from the side of the steel strip.

Steel plate average thickness measurement method:

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