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CHEMICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HG/T 20584-2011

Replacing HG 20584-1998

Technical requirements for fabrication of steel chemical vessels

钢制化工容器制造技术要求

(English Translation)

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2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the editions with the dates indicated are applicable to this Standard. For the undated references, the latest edition (including all the amendments) are applicable to this Standard.

"Steel Pressure Vessels" GB 150

"General Purpose Metric Screw Threads - Basic Dimensions" GB/T 196

"General Purpose Metric Screw Threads - Tolerances" GB/T 197

"Steel Plates for Boilers and Pressure Vessels" GB 713

"Double end studs (clamping type) - Product grade B" GB/T 901

"Designation system for fasteners" GB/T 1237

"Tolerances for fasteners - Bolts, screws, studs and nuts" GB/T 3103.1

"Methods of Radiographic Testing and Classification of Radiographs for Steel

Castings" GB/T 5677

"Fasteners - Surface discontinuities - Bolts, screws and studs for general requirements" GB/T 5779.1

"Fasteners - Surface discontinuities - Nuts" GB/T 5779.2

"Fasteners - Surface discontinuities - Bolts, screws and studs for special requirements" GB/T 5779.3

"Rust grades and preparation grades of steel surfaces before application of paints and related products" GB/T 8923

"General Purpose Metric Screw Threads - Limits of Sizes for the Screw Threads of Medium Quality and Preferable Plan" GB/T 9145

"Methods of Liquid Penetrant Testing and Classification of Indication for Steel Castings" GB/T 9443

"The Methods for Magnetic Particle Testing and for Specifying Quality Levels of Steel Castings" GB/T 9444

"Specification for Welding of Stainless Steel clad Steel Plate" GB/T 13148

"Specification of Design Base for Steel Chemical Vessels" HG/T 20580

3 Terms and definitions

In addition to the terms and definitions given in "Steel Pressure Vessels" GB 150, for the purposes of this Standard, the following terms and definitions apply.

3.0.1 Simulated post welding heat treatment

USE the testing plate or the materials of testing pieces to simulate all post welding heat treatment processes below the phase transformation point A_{c1} and above 480°C experienced by the material during the actual manufacturing process. It is divided into simulated short-period post welding heat treatment and simulated long-period post welding heat treatment.

3.0.2 Simulated short-period post welding heat treatment

USE the testing plate or the materials of testing pieces to simulate one post welding heat treatment period below the phase transformation point A_{c1} and above 480°C experienced by the material during the actual manufacturing process.

3.0.3 Simulated long-period post welding heat treatment

USE the testing plate or the materials of testing pieces to simulate all post welding heat treatment processes below the phase transformation point A_{c1} and above 480°C experienced by the material during the actual manufacturing process, including one or multi-rework post welding heat treatments. At least one times of post welding heat treatment shall be reserved for the user's future applying.

3.0.4 Vessel axis

It refers to a straight line perpendicular to the reference surface center.

5.0.1

The raw materials used for the pressure parts of pressure vessels shall meet the following requirements.

- 1 Requirements of design documents.
- 2 "Steel Pressure Vessels" GB 150.
- 3 "Specification of Materials Selection for Steel Chemical Vessels" HG/T 20581.
- 4 Corresponding requirements of this Standard.

5.0.2

The materials used for the non-pressure parts of pressure vessels shall meet the following requirements.

- 1 When the material is welded with a pressure part, its mechanical properties and chemical composition shall be near to those of the material of the pressure part.
- 2 Though it is not welded with a pressure part, when it is necessary to use a welded joint, it shall be a steel with a good welding performance.

5.0.3

The manufacturing plant shall, according to the requirements of Article 5.0.1 of this Standard, carry out examination and acceptance, if necessary, reinspection for the incoming materials.

If the performance data of the material required according to Article 5.0.1 of this Standard are incomplete, the manufacturing plant shall carry out reinspection or supplementary examinations. Only after the materials are qualified, can they be put into use.

5.0.4

If the manufacturing organization of materials does not carry out the nondestructive testing according to Article 5.0.1 of this Standard, the manufacturing plant shall carry out the testing for supplement. Unless otherwise stated in the design documents, the nondestructive testing method and its grading for the steels used for pressure parts shall be carried out according to the requirements of Table 5.0.4-1. The qualification grade, if the design has no special requirement, shall comply with the requirements of Table 5.0.4-2 ~ Table

5.0.4-5.

Table 5.0.4-2 -- Qualification grade of ultrasonic testing for steel plates and tubes

Material variety Ultrasonic

Carbon and low- alloy steel plates for pressure vessels

Standard. 4.1 of JB/T 4730.3

Application scope. 6~250mm (in thickness)

Qualification grade. Commonly-used carbon and low-alloy steel plates,

Grade III The carbon and low-alloy steel plates with a thickness greater than or equal to 12m for the following pressure vessel shells shall not be less than Grade II.

Inner-cylinder steel plates and hardened and tempered steel plates for single-layer and multi-layer high pressure vessels with $p \geq 10.0 \text{ MPa}$

Pressure vessels used for holding mediums of extremely and highly destructive toxicity

Pressure vessels used in wet hydrogen sulfide corrosion environment

Clad steel plates

Standard. 4.4 of JB/T 4730.3

Application scope. Clad steel plates for pressure equipment whose substrates are greater than or equal to 6mm in thickness

Qualification grade. Clad plates for tube plates, Grade I

Clad steel plates for hot-pressed heads and pressure vessels, Grade II Commonly-used clad plates, Grade III Carbon and low- alloy steel seamless tubes

Standard. 4.5 of JB/T 4730.3

Application scope. Carbon and low-alloy steel seamless tubes whose outside diameter is 12~660mm, and wall thickness is greater than or equal to 2mm

Qualification grade. Grade II ($p < 10.0 \text{ MPa}$)