



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20801.4-2020

**Pressure piping code - Industrial piping - Part 4: Fabrication
and assembly**

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1 Scope

This Part of GB/T 20801 specifies the basic requirements for the fabrication and assembly of pressure piping. These basic requirements include regulations on fabrication, welding, preheating, heat treatment, assembly, erection and piping cleaning, etc.

This Part is applicable to the fabrication and assembly of pressure pipework components defined in the scope of GB/T 20801.1.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 985.1 Recommended Joint Preparation for Gas Welding, Manual Metal Arc Welding, Gas-shield Arc Welding and Beam Welding

GB/T 985.2 Recommended Joint Preparation for Submerged Arc Welding

GB/T 985.3 Recommended Joint Preparation for Gas-shield Arc Welding on Aluminum and Its Alloys

GB/T 985.4 Recommended Joint Preparation for Welding on Clad Steels

GB/T 13927 Industrial Valves - Pressure Testing

GB/T 20801.1-2020 Pressure Piping Code - Industrial Piping - Part 1.General

GB/T 20801.2-2020 Pressure Piping Code - Industrial Piping - Part 2.Materials

GB/T 20801.3-2020 Pressure Piping Code - Industrial Piping - Part 3.Design and Calculation

GB/T 20801.5-2020 Pressure Piping Code - Industrial Piping - Part 5.Inspection and

Testing

GB/T 20801.6-2020 Pressure Piping Code - Industrial Piping - Part 6.Safeguarding

GB 50236 Code for Construction of Field Equipment, Industrial Pipe Welding Engineering

NB/T 47014 Welding Procedure Qualification for Pressure Equipment TSG ZF001 Safety
Technical Supervision Regulation for Safety Valves TSG Z6002 Examination Rules for
Welding Operators of Special Equipment

3 Terms and Definitions

What is defined in GB/T 20801.1-2020, GB/T 20801.2-2020, GB/T 20801.3-2020,

GB/T 20801.5-2020 and GB/T 50801.6-2020, and the following terms and definitions are
applicable to this document.

3.1 Manufacture

Manufacture refers to the manufacturing process of pipes, piping components or
pipe-supporting elements, etc.

3.2 Fabrication

Fabrication refers to the preparation work before piping erection.

3.3 Assembly

Assembly refers to the process of connecting two or more piping components (including
piping pre-fabrication) with bolts, welding, bonding, threading, brazing, soldering or using
sealing elements in accordance with the provisions of the design documents.

3.4 Erection

Erection refers to the process of completely fixing a piping system on a designated position
and support in accordance with the provisions of the design documents.

3.5 Isometric Diagram

Isometric diagram refers to the drawing of each piping into an isometric drawing of piping
represented by single lines in accordance with the drawing method of axonometric
projection.

3.6 Hot Bending

Hot bending refers to the process of fabricating bent pipes when the temperature is higher
than the metal critical point AC1.

4.1 The organization manufacturing, fabricating and erecting the piping shall have an

administrative license that complies with the requirements of relevant laws and regulations for pressure piping safety supervision. The organization fabricating and erecting the piping shall establish a corresponding quality assurance system and comply with the following stipulations.

4.2 The fabrication and erection of the piping shall be carried out in accordance with

the design documents and the stipulations of this Part. When it is necessary to modify the design documents and substitute engineering materials, it shall be approved by the original design organization, and a written document shall also be issued.

4.3 The organization fabricating and erecting the piping should adopt a piping welding

information management system, and timely input and save the relevant data of pipework components, welding, heat treatment, inspection and testing, etc.

5 Inspection and Acceptance Inspection of Pipework

Components and Materials

5.1 Material Marking and Acceptance of Quality Certification Documents

The marking and quality certification documents of pipework components and materials shall receive the acceptance inspection in accordance with the design documents and the stipulations of 9.1 and 9.2 in GB/T 20801.2-2020. In addition, they shall also satisfy the following requirements.

5.2 Appearance Inspection

The pipework components and materials shall be checked for their materials, specifications, models and quantities in accordance with the stipulations of the design documents and product standards. In addition, the inspection and acceptance inspection of appearance quality and geometric dimensions shall be carried out one by one. The results shall comply with the stipulations of the design documents and the corresponding product standards.

5.3 Material Inspection

For piping components made of chromium-molybdenum alloy steel, nickel-containing low-temperature steel, stainless steel, nickel and nickel alloy, titanium and titanium alloy

materials, before use, positive material identification (PMI) or other methods shall be adopted to check the contents of main alloy elements. The quantity shall satisfy the following requirements.

5.5 Other Inspections

When the design documents put forward other inspection and acceptance inspection requirements (such as. non-destructive testing and hardness inspection, etc.) for the pipework components and materials, they shall be satisfied. The inspection methods, quantities and inspection results shall comply with the stipulations of the design documents and the relevant standards.

5.7 Material Storage

During the fabrication and erection process, the pipework components and materials shall be properly kept, and shall not be mixed or damaged. During the storage, stainless steel and non-ferrous metal pipework components and materials shall not come into contact with carbon steel or low-alloy steel. The orifices of the pipes, valves and fittings that are not temporarily installed shall be closed.

6.1.1 The cutting processing of the pipework components and materials may adopt the

method of cold cutting or hot cutting. If the method of hot cutting is used, after cutting, the method of mechanical processing or polishing shall be used to eliminate the surface slag and the surface layer that affects the quality of piping welding.

6.1.2 Carbon steel and carbon-manganese steel may adopt the method of mechanical

processing or flame cutting to cut and prepare the joints. Low-temperature nickel steel and alloy steel should adopt the method of mechanical processing to cut and prepare the joints.

6.2.1 During the fabrication of the piping components, the original marks of the

materials shall be verified and kept as much as possible. When it is impossible to keep the original marks, the method of transference shall be adopted to re-mark the materials. The material marking may also adopt the uniform engineering codes or color codes of the piping components.

6.2.2 The use of marking method shall be based on the principle of not causing

damage or contamination to the materials. Hard-printed markings shall not be used for low-temperature steel, stainless steel and non-ferrous metals. When austenitic stainless steel and non-ferrous metal materials are marked with color codes, the printing color shall