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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20801.1-2025

Replacing GB/T 20801.1-2020

Pressure piping code - Part 1: Industrial piping

压力管道规范 第1部分：工业管道

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Table of Contents

1 Scope

GB/T 20801.1-2025 is the Chinese national standard covering the scope and general rules of the industrial piping code - the classification of piping by fluid and by pressure and temperature, the design conditions, and the framework the material, design, fabrication, inspection and safeguarding parts hang from. At 136,000 words this is the largest document in the catalogue. It replaces GB/T 20801.1-2020, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 20801.1-2020.

1.1 This document specifies the basic requirements for the materials, design, fabrication, installation, inspection, testing, safeguarding of industrial pressure piping.

1.2 The industrial pressure piping (hereinafter referred to as "pressure piping") referred to in this document include pressure piping belonging to process units, auxiliary units, utilities within the boundary area. This document applies to pressure piping under the following conditions.

a) Process and refrigeration piping falling within the scope of the "Special Equipment Catalog". This refers to pressure piping with a maximum working pressure greater than or equal to

0.1 MPa (gauge pressure), carrying gases, liquefied gases, steam, or flammable, explosive, toxic, or corrosive liquids with a maximum working temperature higher than or equal to the standard boiling point, with a nominal diameter greater than or equal to 50 mm. Piping with a nominal diameter less than 150 mm and a maximum working pressure less than

1.6 MPa (gauge pressure) conveying non-toxic, non-flammable, non-corrosive gases (excluding liquefied gases, steam, and oxygen) are excluded.

b) Piping meeting the following conditions [excluding those listed in

1.3 a), b), 1.4]. 1) Piping conveying low-hazard (non-toxic, non-flammable, non-corrosive) liquids; 2) Piping conveying low-hazard (non-toxic, non-flammable, non-corrosive) gases (excluding liquefied gases, steam, oxygen), with a nominal diameter less than 150 mm and a maximum working pressure less than

1.6 MPa (gauge pressure); 3) Piping with a nominal diameter less than 50 mm; 4) Piping with a maximum working pressure greater than atmospheric pressure but less than

0.1 MPa (gauge pressure); 5) Vacuum piping.

Note. Piping listed in

1.2

b) are not included in the scope of the "Special Equipment Catalogue".

1.3 This document does not cover the following.

a) Piping with a maximum working pressure greater than 42 MPa (gauge pressure);

b) Non-metallic piping or their linings;

c) Specific requirements for the modification, inspection, testing, maintenance, repair of in-service pressure piping.

1.4 This document does not apply to the following.

a) Piping in military equipment and nuclear facilities;

b) Piping in offshore facilities and underground mines;

c) Piping in oil, natural gas, geothermal, other exploration and extraction equipment;

d) Piping on mobile equipment (such as railway locomotives, automobiles, ships, aerospace vehicles, etc.);

e) GA category long-distance piping;

f) GB category utility piping;

g) GCD category power piping;

h) Internal piping of boilers, pressure vessels, heating furnaces, as well as external pipe connections of equipment;

2 Normative references

The contents of the following documents, through normative references in this document, constitute essential provisions 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 150 (All parts) Pressure vessels

GB/T 150.3-2024 Pressure vessels - Part

3.Design SH/T 3425 Steel line blanks in petrochemical engineering SY/T 5037 Submerged arc welded steel pipes for ordinary fluid conveying pipelines TSG ZF001 Safety technical supervision regulations for safety valves TSG ZF003 Safety technical supervision regulations for bursting disc devices TSG Z6002 Detailed rules for examination of special equipment welding operators YB/T 4173 Forged bored thick-walled seamless steel pipe for high temperature ISO 15848-

1 Industrial valves - Measurement, test and qualification procedures for fugitive emissions - Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Piping A system assembled from piping components for the conveying, distributing, mixing, separating, discharging, metering, or shutting off of fluid flow.

Note. In addition to piping components, this includes pipe-supporting elements, but excludes supporting structures such as building frames, pipe racks, bases (pipe piers or foundations).

3.2 Nominal pressure A parameter representing the pressure rating of a piping component, consisting of the letters PN or Class and a dimensionless number.

3.3 Nominal diameter Explosion group The explosion hazard level of flammable gases and vapors, which are classified according to the maximum experimental safe gap (MESG).

3.81 Fireemergency block valve (FEBV) A block valve that automatically shuts off the fire in the event of a fire without human intervention or external power (electricity, gas, or liquid) supply, possessing fire resistance, antistatic properties, high sealing performance, impact

resistance.

4.1 a) and conforming to the scope of

1.2 a); 2) Refrigeration piping conforming to the scope of

5.1 General provisions

5.1.1 Material selection The construction organization (user organization) or design organization shall select appropriate piping component materials, based on specific usage conditions (including manufacturing, fabrication and installation, media, operating conditions, working environment, testing, etc.) as well as the material usage requirements and limitations specified in this chapter, taking into account the material damage risk. Specific provisions for welding materials are provided in Chapter 7.

5.1.2 Basic technical provisions for materials

5.1.2.1 Tables B.1 and B.2 of Appendix B specify the designations, base material categories, allowable stresses, application ranges of commonly used piping component materials. Materials used for piping components shall also comply with the material standards listed in Tables B.1 and B.2. The physical performance parameters of the materials are shown in Appendix C. The design and selection of commonly used pipeline materials, damage risks, corresponding engineering measures are shown in Appendix D.

5.1.2.2 In addition to the material standards and designations listed in Tables B.1 and B.2, the following materials may also be used in piping components, provided they meet the requirements and usage restrictions for the corresponding materials in this chapter.

a) Other designations of materials listed in the material standards in Tables B.1 and B.2;

5.6.1.2 The markings shall include at least the manufacturer's mark, product standard, specifications, material designation. The markings for the following piping components shall also include the material furnace batch number or code.

a) Piping components for GC1 grade piping;

b) Piping components subjected to impact testing as required by this Chapter;

c) Chromium-molybdenum alloy steel (excluding bolt materials) piping components;

d) Austenitic stainless steel (H-type) piping components used under high- temperature conditions;

e) Nickel and nickel alloys, titanium and titanium alloys, zirconium and zirconium alloy piping components.

5.6.1.3 Each material shall be individually marked. The markings shall be clear and secure. Materials with a nominal size less than or equal to DN40 may be marked with labels or