

TSG

**SPECIAL EQUIPMENT SAFETY TECHNICAL SPECIFICATION OF THE
PEOPLE'S REPUBLIC OF CHINA**

TSG 31-2025

Replacing TSG D0001-2009

Safety technology regulation for industrial pressure pipe

工业管道安全技术规程

(English Translation)

Issued on: October 15, 2025

Implemented on: January 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Foreword

1 General provisions

2 Materials, pipe components, and pipe supporting elements

3 Design

4 Installation

5 Supervision and inspection

6 Use

7 Periodic inspection

8 Safety accessories, flame arresters, and mechanical safety interlock devices and instruments

9 Supplementary provisions

Annex A Classification of industrial pressure pipe grades and the degrees of medium toxicity, corrosiveness, and fire hazard

Annex B Comparison table between industrial pressure pipe design documents and the basic safety requirements of this Regulation

Annex C Industrial pressure pipe installation quality certificate

Annex D Annual inspection of industrial pressure pipe

Annex E Industrial pressure pipe periodic inspection report

Annex F Notice for inspection opinions on special equipment (1)

Annex G Notice for inspection opinions on special equipment (2)

Foreword

This regulation was issued on 15 October 2025 by the State Administration for Market Regulation, and has applied since 1 January 2026.

It is a TSG safety technical specification for special equipment: compliance is mandatory in China.

It replaces two earlier regulations: TSG D0001-2009, the supervision regulation for industrial pressure piping, and TSG D7005-2018, the periodic inspection regulation for industrial pressure piping.

Annexes A to G give the grading of pipes by medium toxicity, corrosiveness and fire hazard, the comparison table between design documents and the requirements of the regulation, the installation quality certificate, and the forms used for annual and periodic inspection.

1.1 Purpose

This Regulation is formulated in accordance with the Special Equipment Safety Law of the People's Republic of China and the Regulations on the Safety Supervision of Special Equipment, in order to ensure the safe use of industrial pressure pipes, prevent and reduce accidents, protect the safety of people's lives and property, and promote economic and social development.

1.2 Scope

This Regulation is applicable to industrial pressure pipes defined in the Special Equipment Directory that simultaneously meet the following conditions:

- (1) The maximum operating pressure is greater than or equal to 0.1 MPa (gauge pressure, same below) and not greater than 100 MPa (Note 1-1);
- (2) The nominal diameter is greater than or equal to 50 mm;
- (3) The conveyed medium is gas, liquefied gas, steam, or liquid that is combustible (flammable), explosive, toxic, corrosive, and has a maximum operating temperature higher than or equal to its standard boiling point.

Industrial pressure pipes (hereinafter referred to as pipes) include process pipes belonging to process units, auxiliary units, and utilities within the battery limit (Note 1-2); power pipes used in thermal power plants for conveying steam and steam-water two-phase media; and refrigeration pipes.

Note 1-1: Pipes with a maximum operating pressure greater than or equal to 42 MPa are uniformly referred to as high-pressure pipes in this Regulation.

Note 1-2: The demarcation point between industrial pressure pipes, long-distance pipelines, and public pipelines is generally the block valve (isolation valve). The boundary dividing process pipelines within oil and gas transmission stations from the main line pipelines is generally the station inlet/outlet block valve (isolation valve), or determined by the pipe user.

1.3 Special provisions for scope

- (1) Process pipes within oil and gas transmission stations in long-distance pipeline systems and airport fuel supply pipes (Note 1-3) shall comply with this Regulation;
- (2) Cryogenic insulated pipes, pipes inside cold boxes (including those inside cryogenic pump boxes), jacketed pipes, pipes inside mother-daughter tanks, and other pipe sections or piping systems with concealed characteristics or which are not suitable for disassembly and inspection during service life shall comply with the requirements of Clauses 1 to 5 of this Regulation.

Note 1-3: Airport fuel supply pipes include airport oil depot pipes and apron refueling pipes.

1.4 Exclusions

This Regulation does not apply to the following pipes:

- (1) Pipes for military equipment and nuclear facilities;
- (2) Pipes on offshore facilities and in mine shafts;
- (3) Dedicated pipes on mobile equipment, such as railway locomotives, automobiles, ships, aerospace vehicles, etc.;
- (4) Pipes for petroleum, natural gas, geothermal exploration, development, and extraction installations, as well as oil and gas field gathering and transmission pipelines;
- (5) Pipes with a nominal diameter less than 150 mm and a maximum operating pressure less than 1.6 MPa (gauge pressure) conveying non-toxic, non-flammable, non-corrosive gases (excluding liquefied gases, steam, and oxygen);
- (6) Pipes integral to equipment (Note 1-4).

Note 1-4: Internal pipes and external pipe connections of equipment such as pumps and compressors (excluding pipes connecting multiple stages on-site), steam turbines, gas turbines, internal combustion engines, packaged refrigeration units, quick-freezing devices, and other fluid conveying or processing equipment.

1.5 Definition of pipe scope

The scope of pipes applicable under this Regulation includes pipe components, pipe supporting elements, connection joints, mechanical safety interlock devices, and instruments.

- (1) Pipe components refer to parts used to connect or assemble into a closed pressure piping system, including pressure piping elements, safety accessories, as well as non-ferrous metal (non-ferrous metal alloy) pipe fittings, cast pipe fittings, flexible joints, pressure hoses, fasteners, cryogenic insulated pipes, directly buried jacketed pipes, sight glasses, and throttling devices in pipelines (such as orifice plates), etc. (Note 1-5);
- (2) Pipe supporting elements, including hanger rods, spring hangers and supports, diagonal tie rods, counterweights, turnbuckles, support rods, chains, guides, saddles, bases, rollers, cradles, sliding supports, lugs, pipe hangers, shackles, pipe clamps, U-bolts, and clamp plates, etc.;
- (3) Connection joints, including joints between pipe components, the first connection joint where the pipe connects to equipment or devices (welds, flanges, seals, fasteners, etc.), and joints connecting pipes to non-pressure components;
- (4) Mechanical safety interlock devices and instruments.

Note 1-5: (1) Pressure piping elements include pressure piping tubes, pressure piping fittings, pressure piping valves, pressure piping flanges, expansion joints, pressure piping sealing elements, and pressure piping special elements; where, pressure piping special elements include anti-corrosion piping elements and element combination assemblies; element combination assemblies refer to devices formed by combining pressure piping elements such as tubes, fittings, valves, flanges, expansion joints, sealing elements, etc. (by welding, flanged connection, etc.) to possess a specific function, including gas pressure regulating stations, attemperators and pressure reducing stations, flame arresters, flowmeter (housings) (Note 1-6), and factory prefabricated pipe spools (Note 1-7);

(2) Safety accessories refer to safety valves, bursting disc devices, and emergency shut-off valves used on pipes.

Note 1-6: Flowmeter (housing) refers to a housing made from tubes, plate coils, castings, forgings, flanges, pipe fittings, etc., through machining or welding, that withstands the internal medium pressure of the flowmeter.

Note 1-7: Factory prefabricated pipe spools refer to pipe element products where the manufacturer welds or flange-connects pressure piping elements into an integral assembly according to construction design drawings within the factory for shipment as a whole, including: manifolds, filters, separators, drip legs (drip pots), dirt traps, mixers, buffers, pig launchers/receivers, insulated joints, loading arms, etc., excluding pipe prefabrication performed at the construction site.

1.6 Grading of piping

Pipes within the scope of this Regulation are graded into GC1, GC2, and GCD levels according to design pressure, design temperature, medium toxicity, corrosiveness, and fire hazard.

The classification of pipe grades and the degrees of medium toxicity, corrosiveness, and fire hazard are specified in Annex A of this Regulation.

1.7 Relationship with technical standards and management systems

This Regulation specifies the basic safety requirements for pipes. Other technical standards and management systems shall not be lower than the requirements of this Regulation.

1.8 Special provisions for non-conformance with this Regulation

Entities adopting new materials, technologies, or processes that are inconsistent with the requirements of this Regulation, or for which this Regulation has no requirements but which may significantly impact safety performance, shall declare to SAMR for implementation of sandbox supervision. SAMR shall organize technical review and approval according to the evaluation and approval procedures for new materials, technologies, and processes.