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Definition and Applications

GB/T 3091

- ALLLAND Production Standards Overview

1. Definition

GB/T 3091 “Welded steel pipes for low-pressure fluid delivery” is the Chinese national standard for welded carbon steel pipes. It specifies requirements for manufacturing, dimensions, performance, and testing of both galvanized and non-galvanized pipes, made by processes such as high-frequency welding (HFW/ERW). These pipes are designed for conveying water, gas, air, heating steam, and other low-pressure fluids.

2. ALLLAND GB/T 3091 Steel Pipe Dimensions

Parameters	Dimensions
O.D.	21.3 mm – 1626 mm
WT	2.0 mm – 16 mm (varies by diameter and service)
Length	6 m – 12 m (common); fixed or random lengths available
Material	Q195, Q215, Q235, Q275, Q355
Process	Q195, Q215, Q235, Q275, Q355
Connection	Threaded, Grooved, Plain end for Welding, Flanged

3. Application

GB/T 3091 pipes are suitable for low-pressure fluid systems at temperatures not exceeding 175°C. Typical applications include:

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Critical Tolerances

ALLLAND STEEL PIPE

- Water supply, drainage, and irrigation pipelines.
- Low-pressure steam heating and HVAC systems.
- Structural supports, fencing, and scaffolding.
- Compressed air and non-corrosive gas lines.

Manufacturing adheres to strict dimensional tolerances as per the standard.

Item	Tolerance	Description
O.D.	D ≤ 48.3 mm: ±0.5 mm 48.3 < D ≤ 273 mm: ±1.0% D > 273 mm: ±0.75%	Ensures proper fit for joining and installation.
WT	t ≤ 3 mm: ±15% / -10% 3 < t ≤ 6 mm: ±14% / -10% t > 6 mm: ±12.5% / -10%	Minimum wall at any point is 90% of nominal thickness.
Length	Fixed Length: +20 mm / 0 mm	Standard cut lengths ensure consistency on site.
Straightness	≤ 1.5 mm per meter length	Guarantees ease of installation and alignment.

Chemical and Mechanical Properties

1. Chemical Composition (wt%, max)

Grade	C ≤	Mn	Si ≤	P ≤	S ≤
Q195	0.12	0.25 – 0.50	0.3	0.035	0.035
Q215 A	0.15	0.25 – 0.55	0.3	0.045	0.045
Q215 B	0.15	0.25 – 0.55	0.3	0.045	0.04
Q235 A	0.22	0.30 – 0.65	0.3	0.045	0.045
Q235 B	0.2	0.30 – 0.70	0.3	0.045	0.045
Q235 C	0.17	0.35 – 0.80	0.3	0.04	0.04
Q235 D	0.17	0.35 – 0.80	0.3	0.035	0.035
Q275 A	0.24	0.50 – 0.90	0.3	0.045	0.045
Q275 B	0.21	0.50 – 0.90	0.3	0.045	0.045
Q275 C	0.2	0.50 – 0.90	0.3	0.04	0.04
Q275 D	0.2	0.50 – 0.90	0.3	0.035	0.035
Q355 B	0.24	≤1.60	0.55	0.045	0.045
Q355 C	0.22	≤1.60	0.55	0.04	0.04
Q355 D	0.2	≤1.60	0.55	0.035	0.035

2. Mechanical Properties

Grade	Yield Strength (ReL), MPa	Tensile Strength (Rm), MPa	Elongation (A), %
Q195	195	315	24
Q215	215	335	22
Q235	235	370	20
Q275	275	410	18
Q355	355	470	17

Testing Requirements

1. Chemical Analysis

- Purpose: Verify conformity of base material to specified steel grade.
- Method: Spectrometric analysis (OES) or wet chemical analysis per GB/T 223.
- Frequency: One test per steel heat or batch.

2. Tensile Test

- Purpose: Determine yield strength (ReL), tensile strength (Rm), and elongation (A).
- Specimen: Full-section or machined strip from pipe body, tested per GB/T 228.1.
- Frequency: One test per batch.

3. Hydrostatic Test (Mandatory for all pipes)

- Purpose: Verify pressure integrity and leak-tightness.
- Test Pressure (P): Calculated as P = 2 * S * t / D, where:
  - ✧ S = 185 MPa (for most grades like Q235; Q355 uses 250 MPa)

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ALLLAND STEEL PIPE