

GOST 10704 Grade 45

- ALLLAND Production Standards Overview



Definition and Applications

1. Definition

GOST 10704 Grade 45 Steel Pipe is a longitudinal electric-welded carbon steel pipe manufactured using Steel 45, a medium-carbon steel grade known for its good strength, hardness, and mechanical performance. The pipe is suitable for industrial applications requiring reliable structural strength and dimensional consistency.

2. ALLLAND GOST 10704 Grade 45 Steel Product Specifications

Item	Specification
Product Name	GOST 10704 Grade 45 Steel Pipe
Standard	GOST 10704
Steel Grade	Steel 45 / Grade 45
Material Type	Medium Carbon Steel
Product Type	Longitudinal Electric-Welded Steel Pipe
Manufacturing Process	ERW / Electric Welded
Outside Diameter	According to GOST 10704 applicable size range
Wall Thickness	According to specified OD and applicable standard requirements
Length	Fixed Length, Random Length, or Customized
Pipe Ends	Plain End or Customized
Surface Condition	Bare, Black, Oiled, Painted, or Anti-Corrosion Coated
Inspection	Visual, Dimensional, UT, Hydrostatic Test, and Other Tests as Required
Certification	EN 10204 3.1 MTC Available upon Request



3. Application

GOST 10704 Grade 45 Steel Pipe is widely used in **industrial and engineering applications** requiring reliable mechanical strength and dimensional stability.

Typical applications include mechanical equipment, machinery manufacturing, structural fabrication, industrial facilities, equipment frames, transmission systems, general engineering components, and selected pipeline applications.

With the mechanical properties of Steel 45 and the dimensional consistency of **electric-welded** pipe manufacturing, this product is suitable for projects requiring a balance of strength, machinability, and fabrication performance.

Critical Tolerances

The dimensional tolerances of GOST 10704 Grade 45 Steel Pipe are controlled according to **GOST 10704** requirements. Critical parameters include outside diameter, wall thickness, length, ovality, straightness, and weld reinforcement.

1. Outside Diameter Tolerance

Outside Diameter (mm)	Normal Manufacturing Accuracy	Increased Manufacturing Accuracy
10	±0.2 mm	—
>10–30	±0.3 mm	±0.25 mm
>30–51	±0.4 mm	±0.35 mm
>51–193.7	±0.8%	±0.7%
>193.7–426	±0.75%	±0.65%
>426–1020	±0.7%	±0.65%
>1020	±0.6%	±6.0 mm

2. Wall Thickness Tolerance

Pipe Outside Diameter	Wall Thickness Tolerance
Up to 152 mm	±10%
>152–1020 mm	According to GOST 19903 requirements
>1020 mm, WT 8–15 mm	±10% of specified wall thickness
>1020 mm, WT >15 mm	±1.5 mm

For pipes with an outside diameter greater than 76 mm, a local wall thickening of up to **0.15 mm at the weld upset** is permitted in addition to the specified wall thickness tolerance.

3. Fixed Length Tolerance

Specified Pipe Length	Accuracy Class I	Accuracy Class II
Up to and including 6 m	+10 mm	+50 mm
Over 6 m	+15 mm	+70 mm

For multiple-length pipes, the total positive deviation shall not exceed:

- **+15 mm for Accuracy Class I**
- **+100 mm for Accuracy Class II**

4. Ovality

For pipes with an outside diameter of up to 630 mm manufactured in accordance with the applicable requirements, ovality shall not exceed the specified outside diameter tolerance.

For pipes with an outside diameter of 478 mm and above, the maximum ovality at pipe ends shall be:

Accuracy Class	Maximum Ovality
Class I	1.0% of Outside Diameter
Class II	1.5% of Outside Diameter
Class III	2.0% of Outside Diameter

5. Straightness

Pipe Type / Requirement	Maximum Curvature
Standard Requirement	1.5 mm per meter
Pipes up to 152 mm OD, when specified	1.0 mm per meter
Large-Diameter Pipes Manufactured to Applicable Requirements	Total curvature $\leq 0.2\%$ of pipe length

6. Pipe End Outside Diameter Tolerance

For pipeline pipes with an outside diameter of 478 mm and above:

Outside Diameter (mm)	Increased Accuracy	Normal Accuracy
478–720	± 1.6 mm	± 2.5 mm
>720–1020	± 2.0 mm	± 2.5 mm
>1020	± 3.5 mm	± 4.0 mm

These tolerances ensure reliable dimensional consistency for pipe fabrication, welding, assembly, and installation.

Chemical and Mechanical Properties

1. Chemical Composition

The chemical composition of Steel 45 is controlled to provide a balanced combination of strength, hardness, and machinability.

Element	Content (%)
Carbon (C)	0.42–0.50
Silicon (Si)	0.17–0.37
Manganese (Mn)	0.50–0.80
Phosphorus (P)	≤ 0.035
Sulfur (S)	≤ 0.040
Chromium (Cr)	≤ 0.25
Nickel (Ni)	≤ 0.25
Copper (Cu)	≤ 0.25

Chemical composition may vary depending on the applicable material specification and agreed supply condition.

2. Mechanical Properties

Steel 45 provides good mechanical strength and is widely used for components and structures requiring higher strength than low-carbon steel grades.

Property	Typical Requirement
Tensile Strength	≥ 570 MPa
Yield Strength	≥ 335 MPa
Elongation	≥ 16%
Hardness	According to supply condition
Material Characteristic	Medium Carbon Steel
Machinability	Good
Weldability	Suitable with appropriate welding procedures

Mechanical properties may vary depending on heat treatment condition, product dimensions, and applicable technical requirements.

Dimension Specifications Table

Outside Diameter (OD) mm	Wall Thickness (WT) mm	Standard Length	Pipe Type
10–20	0.8–2.0	4–12 m	Electric-Welded Steel Pipe
>20–30	1.0–3.0	4–12 m	Electric-Welded Steel Pipe
>30–48	1.0–4.0	4–12 m	Electric-Welded Steel Pipe
>48–76	1.5–5.0	4–12 m	Electric-Welded Steel Pipe
>76–114	2.0–6.0	5–12 m	Electric-Welded Steel Pipe
>114–159	3.0–8.0	5–12 m	Electric-Welded Steel Pipe
>159–219	3.0–10.0	5–12 m	Electric-Welded Steel Pipe
>219–325	4.0–14.0	6–12 m	Electric-Welded Steel Pipe
>325–426	5.0–18.0	6–12 m	Electric-Welded Steel Pipe

Outside Diameter (OD) mm	Wall Thickness (WT) mm	Standard Length	Pipe Type
>426–630	6.0–22.0	6–12 m	Electric-Welded Steel Pipe
>630–820	8.0–25.0	6–12 m	Electric-Welded Steel Pipe
>820–1020	8.0–30.0	6–12 m	Electric-Welded Steel Pipe
>1020–1420	10.0–32.0	6–12 m	Electric-Welded Steel Pipe

Available Size Range:
Outside Diameter: 10–1420 mm

Wall Thickness: 0.8–32 mm

Length: 4–12 m or Customized

Specific combinations of outside diameter, wall thickness, length, manufacturing accuracy, and technical requirements should be confirmed according to the applicable GOST standard and purchase order.

ALLLAND GOST 10704 Grade 45 Product Images



The image shows steel pipes actually produced by our company