

Spherical Tank Fabrication, Erection & Inspection Guide

1. Spherical Tank Fabrication Workflow

1 Steel Plate Receiving and Inspection



Receive pressure-vessel steel plates and inspect material identification and thickness.

2 Line Marking and Plate Cutting



Mark the developed shell shape on the plate and cut to required blank shape using CNC cutting equipment.

3 Cold Forming



Form the cut plate into a spherical curved shell segment using a hydraulic press (cold forming).

4 Bevel Machining / Edge Preparation



Machine the edge bevel on the formed shell plate for welding preparation.

5 Dimensional and Curvature Inspection



Inspect dimensional accuracy and curvature of the formed shell segment.

Key Technical Checkpoints

Material Identification



- Verify material grade and heat number on plate and documents.
- Check traceability and compliance with specifications.

Plate Thickness



- Measure and confirm plate thickness at multiple points.
- Ensure it meets design requirements and allowable tolerance.

Curvature



- Check curvature using radius template or coordinate measurement.
- Confirm conformance to design radius and profile.

Bevel Preparation



- Verify bevel angle, land and root gap as per welding specification.
- Ensure clean and smooth surface without defects.

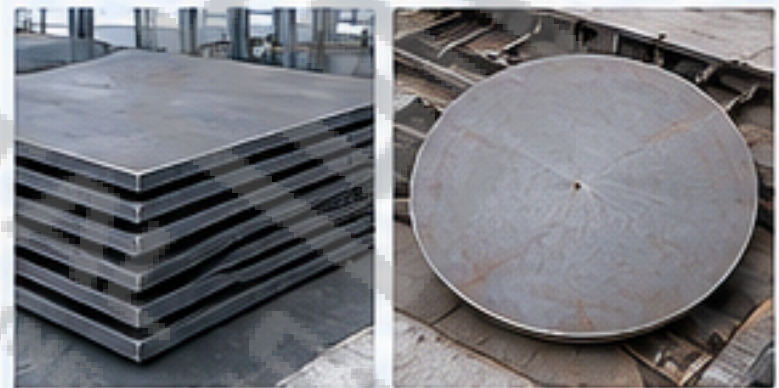
Dimensional Verification



- Check segment dimensions (length, width, height) against drawings.
- Verify overall profile and fit-up requirements.

Spherical Tank Fabrication Workflow

1 Material Preparation and Plate Cutting



Steel Plate

Profiling and Cutting

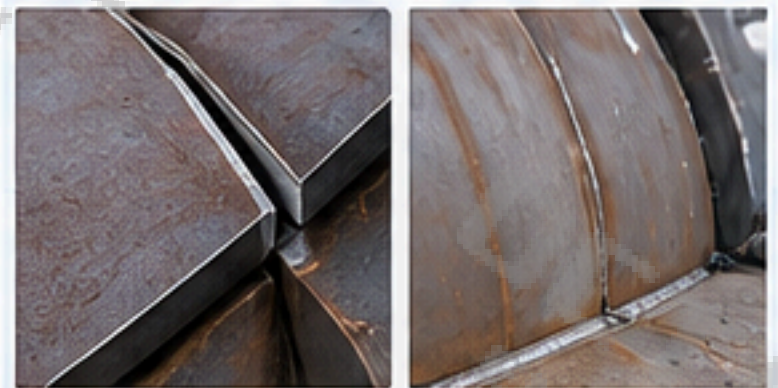
2 Cold Forming of Spherical Shell Plates



Formed Shell Plate

Curvature Verification

3 Shell Assembly and Fit-up



Shell Plate Alignment

Fit-up Inspection

4 Welding and NDT Inspection



Weld Seam

UT Inspection

5 Heat Treatment, Testing and Final Acceptance



Hydrostatic Test

Final Inspection

Key Technical Details

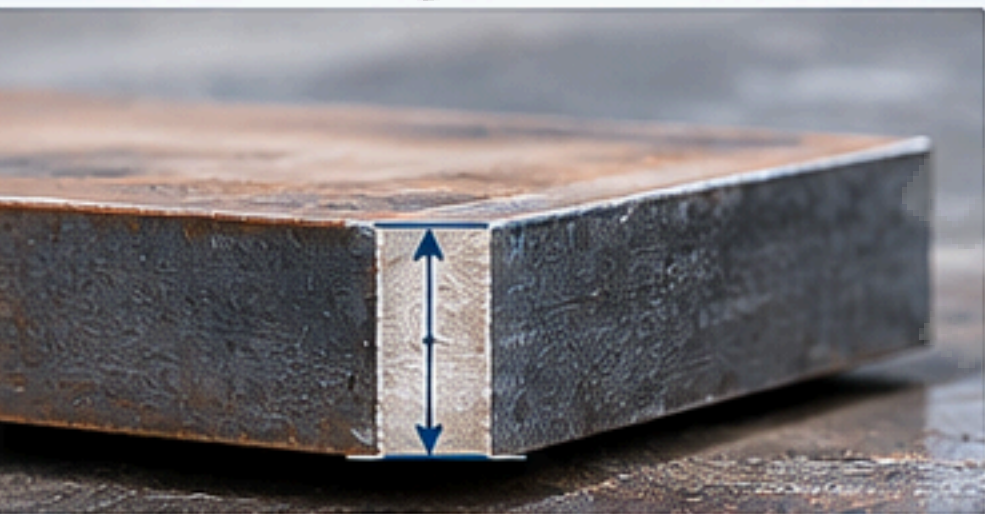


Plate Thickness



Spherical Curvature



Bevel Preparation



Finished Weld Joint

Cold Forming and Dimensional Verification

1 Flat Steel Plate



2 Hydraulic Press Forming



3 Formed Spherical Shell Plate



4 Dimensional Verification



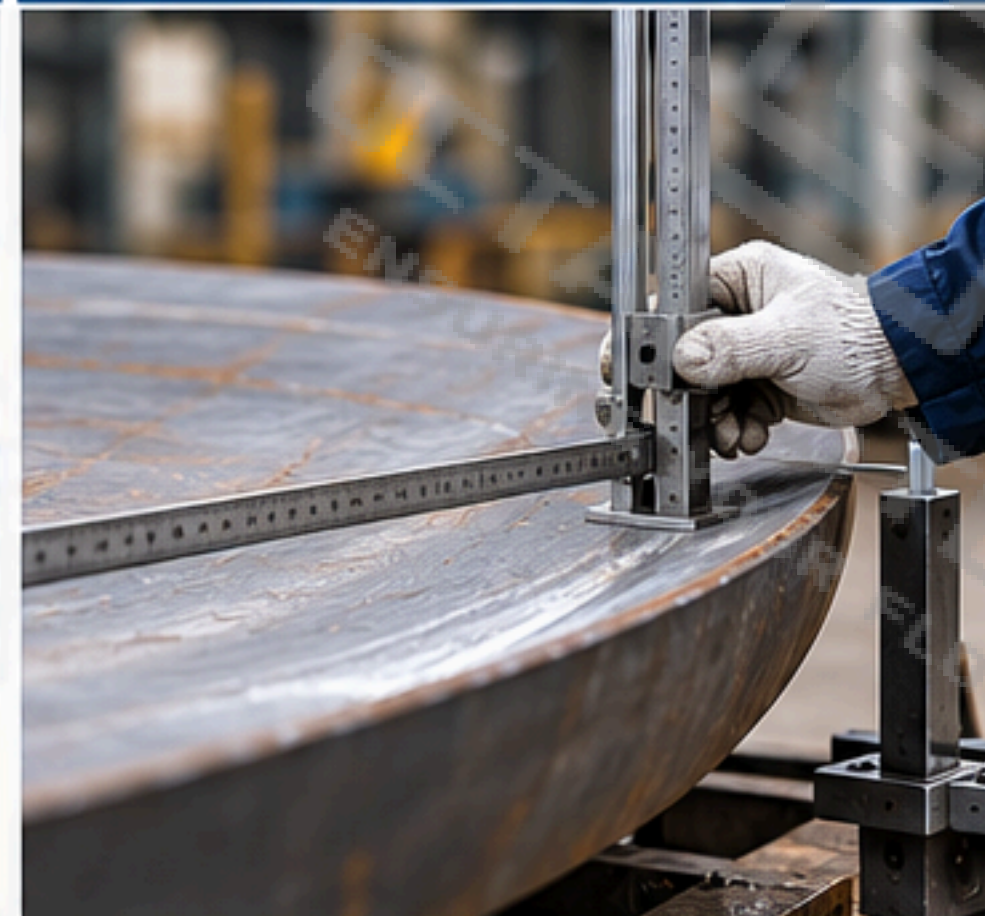
Plate Thickness Verification



Spherical Curvature Inspection



Profile and Dimension Check

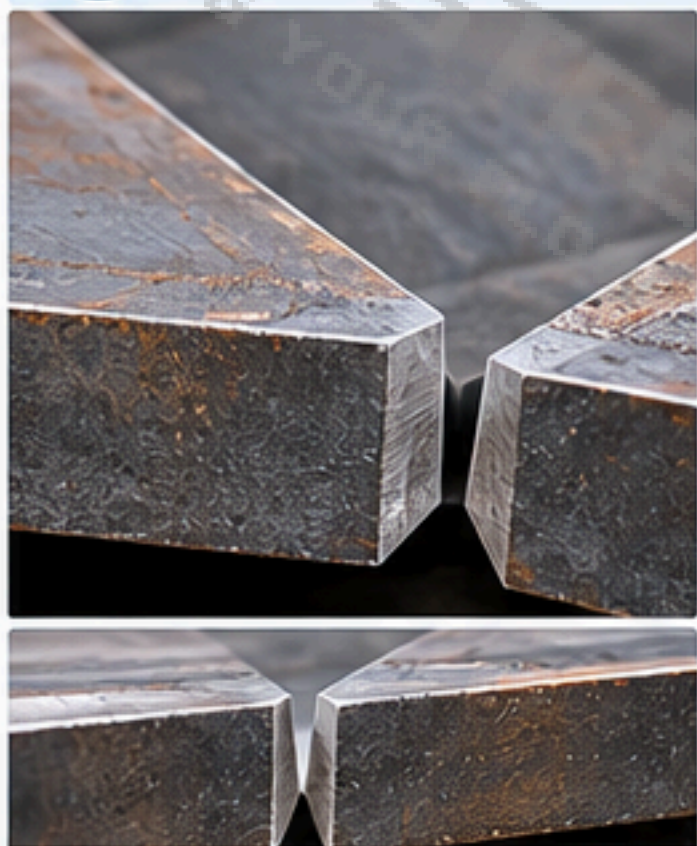


Formed Shell Plate



4 Welding and NDT Inspection

1 Joint Preparation



Bevel Preparation and Alignment

2 Tack Welding



Tack Welding and Fit-up Check

3 Multi-pass Welding



Root Pass, Fill Pass and Cover Pass

4 Weld Appearance



Completed Weld Seam

5 Weld Inspection



Visual Inspection and NDT Examination

Main NDT Inspection Methods

1 Visual Inspection (VT)



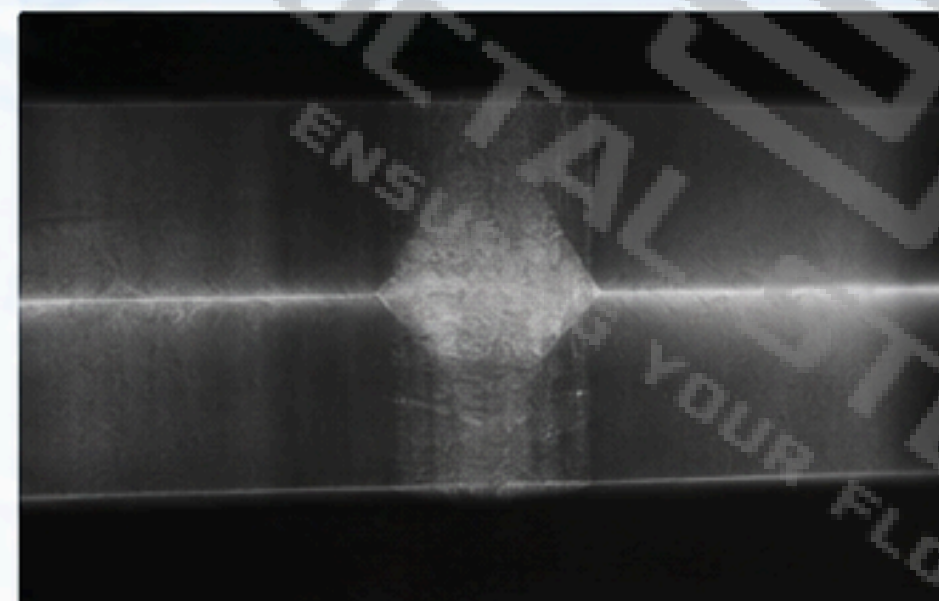
Check weld appearance, surface defects and overall weld quality.

2 Ultrasonic Testing (UT)



Detect internal defects such as lack of fusion, slag inclusions and cracks.

3 Radiographic Testing (RT)



Provide internal weld quality assessment for critical joints.

4 Magnetic Particle or Penetrant Testing (MT/PT)



Identify surface and near-surface defects on welds.

5

Heat Treatment, Pressure Testing and Final Acceptance

1

Post-weld Heat Treatment
(if required)

Stress relief heat treatment is carried out when required by material, thickness and code.

2

Hydrostatic Pressure Testing



Fill with water and pressurize to the specified test pressure. Hold for the required duration and check for leakage, deformation or abnormal conditions.

3

Leak Test (If Required)



For specific service or code requirements, a leak test using air, nitrogen or other methods is performed to verify tightness.

4

Final Inspection



Carry out final visual inspection, dimensional check and documentation review to confirm compliance with project specifications and applicable standards.

Final Acceptance and Documentation

Dimensional Inspection



Verify overall dimensions, roundness and elevation.

Weld Inspection Records



UT/RT/MT/PT reports for all welds.

Test Records



Hydrostatic test, leak test and other required tests.

Material Documentation



Mill test certificates (MTC) and material traceability.

Inspection and Measurement Reports



Dimensional reports, NDT reports and inspection records.

Final Acceptance



Confirm compliance and hand over documentation.