

Spiral Silo Forming Methods, Seam Design and Inspection Guide

On-Site Continuous Forming, Seam Connection, Material Selection and Inspection Hold Points

1. Two Spiral Silo Forming Methods

Spiral silo shells can be formed by a mechanically double-folded seam or by an automated welded spiral seam. Both methods use continuous steel strip, but their connection details, material range and inspection controls differ.

Double-Folded Spiral Seam

Profiled strip edges are folded twice into a mechanically interlocked spiral joint.

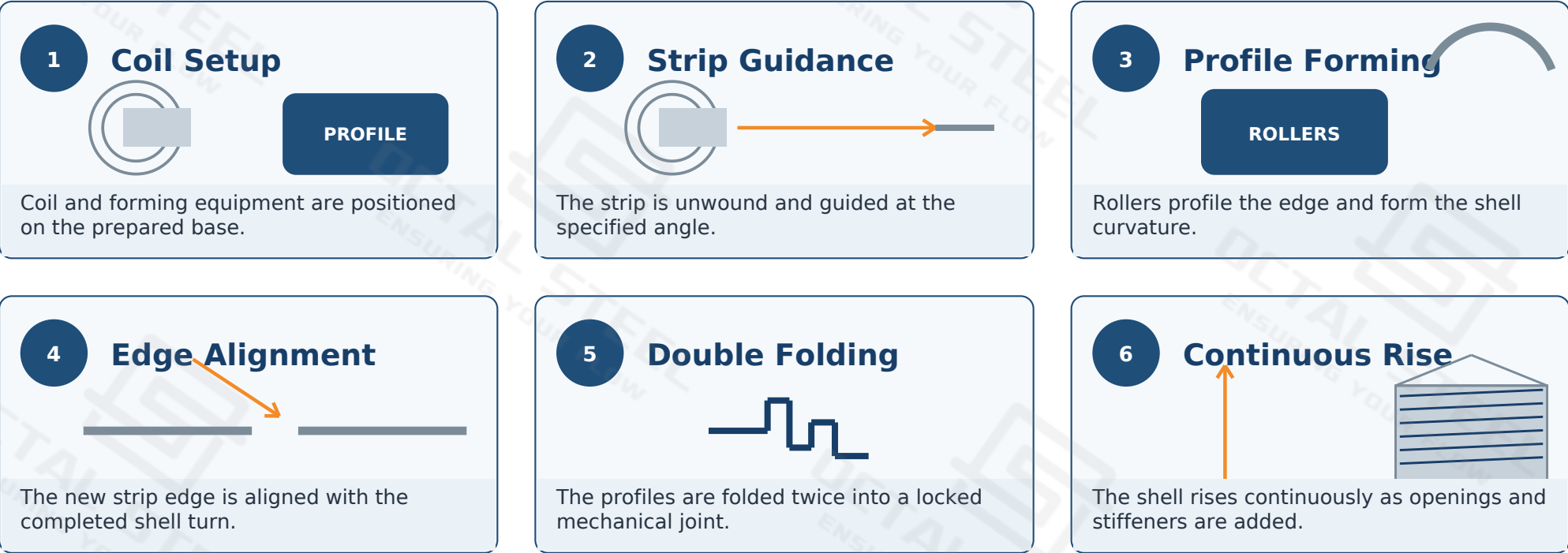
Automated Welded Spiral Seam

Aligned strip edges are fusion-welded in accordance with the approved welding system and procedure.

Selection Item	Double-Folded Seam	Automated Welded Seam
Primary connection	Mechanical folding of profiled edges	Fusion-welded connection
Inspection emphasis	Lock geometry, profile continuity, strip alignment and seal treatment	Fit-up, weld continuity, distortion and specified NDT
Project definition	Approved forming profile, compatible material and sealing system	Approved WPS, weld arrangement and acceptance criteria

2. Double-Folded Seam Forming Sequence

The double-folded method joins profiled strip edges mechanically. The six stages below show the principal forming sequence and the controls that protect seam continuity.

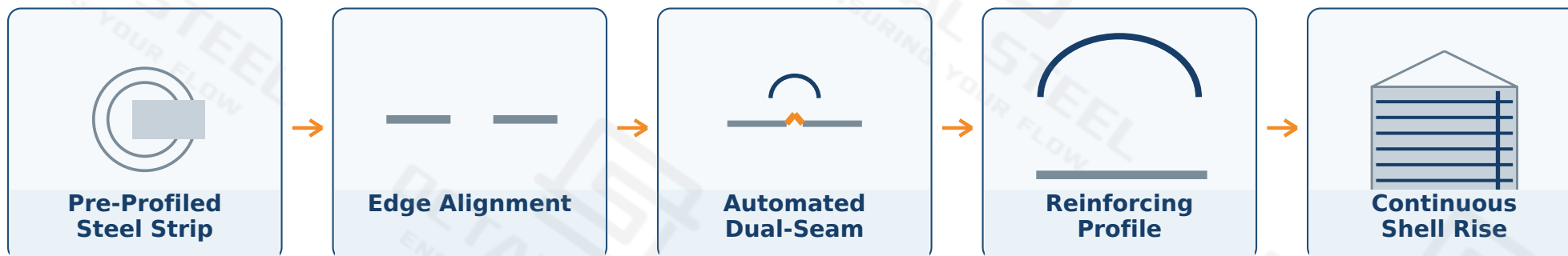


Critical Seam Controls

Control Point	What to Verify	Why It Matters
Strip alignment	No step, twist or offset before folding	Avoids local distortion or incomplete lock geometry
Fold profile	Uniform formed shape and continuous mechanical engagement	Maintains seam continuity around the shell
Seal and geometry	Compatible seal treatment; circularity and verticality checked at hold points	Controls enclosure performance and accumulated geometric error

3. Automated Welded Spiral Forming

Automated welded spiral construction also forms the shell continuously from steel coil, but adjacent strip edges are joined by a qualified welding process rather than mechanical folding.



Welded Joint Detail



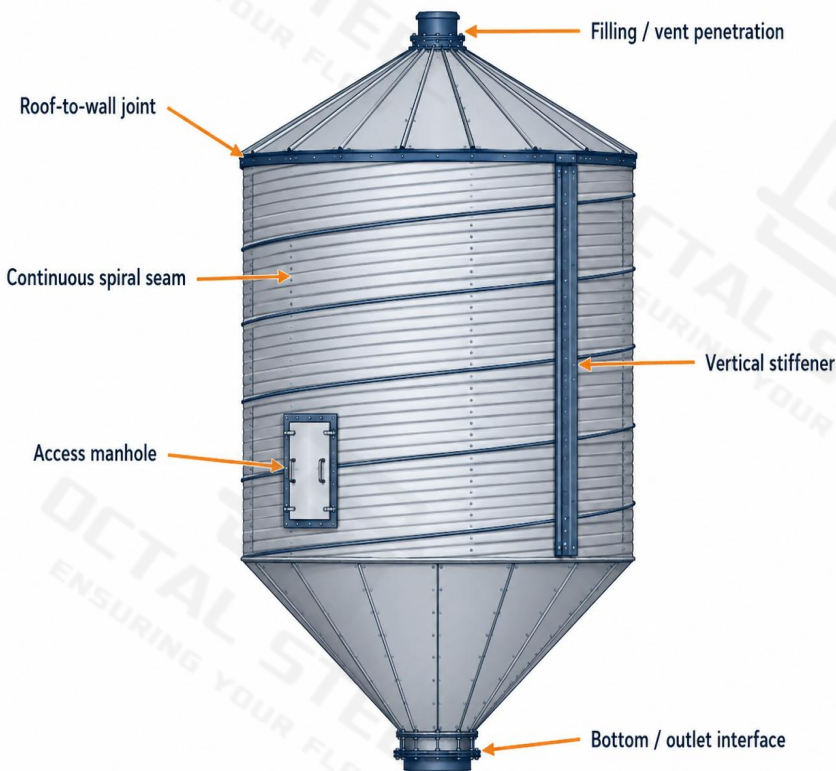
Edge preparation, weld sequence, seam arrangement and any reinforcing profile must follow the approved design and qualified welding procedure.

Inspection Stage	Minimum Focus
Before welding	Material identity, edge condition, fit-up and alignment
During welding	Stable parameters, seam tracking, continuity and distortion control
After welding	Visual testing of weld surface and adjacent material
Additional NDT	Method and extent as required by the project specification
Geometry	Circularity, verticality and local deformation at defined stages

ISO 17637:2016 provides a basis for visual testing of fusion-welded joints. Acceptance levels, NDT extent and repair procedures remain project-specific.

4. Seam, Wall and Opening Details

The formed wall is one part of the storage enclosure. Roof joints, penetrations, stiffeners, manholes, inlets and outlets must be detailed and inspected as a coordinated structure.



Detail	Principal Risk	Inspection Focus
Roof-to-wall joint	Rainwater entry or local distortion	Connection continuity, seal treatment and drainage path
Openings / penetrations	Stress concentration, leakage or corrosion	Reinforcement, edge finish, sealing and equipment support
Stiffeners	Load-path interruption or local buckling	Position, connection continuity and straightness
Manholes	Loss of enclosure and unsafe access	Frame condition, gasket, closure and clearance
Bottom / outlet	Product retention, leakage or misalignment	Interface geometry, isolation, support and downstream connection

Reliable enclosure depends on the complete detail chain: seam, roof, wall penetrations, manholes, bottom and outlets. Inspection should follow material-flow and moisture-entry paths, not only the visible spiral joint.

5. Material and Protection Selection

Shell material and protection are selected from the stored medium, internal moisture, operating temperature, cleaning method and external corrosion environment.

Stored Medium
Dry bulk solid / chemically active
/ hygiene-sensitive



Internal Exposure
Dry / condensation / washing /
elevated temperature



External Exposure
Indoor / industrial / humid /
coastal



Final System
Base steel + surface protection
+ compatible seals and
interfaces

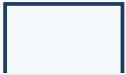
Material / Protection Option	Typical Selection Basis	Inspection and Documentation Focus
Galvanized steel	Dry, non-corrosive bulk solids where zinc coating is compatible	Coating continuity, cut edges, handling damage and repair method
Carbon / black steel	Welded systems or applications using a defined coating or lining	Material certificates, surface preparation and coating records
Stainless steel	Hygiene-sensitive, corrosive or wash-down duties after compatibility review	Grade verification, surface condition and contamination control
Duplex / composite systems	Different internal and external exposure conditions	Layer or grade identification, joining details and interface compatibility
Local wear protection	Abrasive filling streams, impact zones, outlets and transfer points	Replaceable liner coverage, fixing method and inspection access

Protection must cover the complete enclosure: cylindrical wall and spiral seam, roof, stiffeners, fasteners, manholes, inlets and outlet connections. Material designation alone is not a corrosion-control plan; the proposal must also define coatings or linings, seal compatibility, wear protection and field-repair requirements.

6. On-Site Inspection Checklist

Inspection should be staged as the shell rises. Hold points prevent hidden defects from being covered by later forming, roof work, stiffeners or process connections.

Technical basis: official LIPP Double-Seam, Welding Technology and Bulk Storage descriptions; ISO 17637:2016 for visual testing of fusion-welded joints. Final acceptance follows approved drawings, material specifications, welding procedures, applicable codes and the project ITP.

1 Material Identity  Grade, thickness, coating and traceability are verified.	2 Reference Geometry  Foundation datum, centreline, diameter, level and equipment setup are verified.	3 Seam Continuity  The folded or welded seam remains continuous and correctly aligned.	4 Shell Geometry  Circularity, verticality and local deformation are recorded.
5 Openings and Stiffeners  Openings, reinforcement and connections match approved drawings.	6 Enclosure Details  Roof joints, seals, manholes, inlets and outlets are complete.	7 Weld Examination  VT and specified NDT are accepted before coating or restricted access.	8 Records and Release  Inspection reports, repair records and punch-list closure are complete.

Recommended Inspection Hold Points

Hold Point	Release Condition
HP-1 - Before shell forming	Foundation reference and material identity accepted
HP-2 - First full circumference	Forming profile, alignment and connection method verified
HP-3 - Before roof / opening closure	Shell geometry, stiffeners and hidden details recorded
HP-4 - Before coating or restricted access	Weld VT / specified NDT and repairs accepted
HP-5 - Final release	Enclosure details, punch list and documentation complete