

Shelf Pin Hole Location Accuracy Measurement

1.0 Objective & Quality Standard

The objective of this procedure is to verify that all shelf pin holes are drilled within the specified location tolerance to ensure proper shelf alignment, consistent reveal, and trouble-free assembly. Acceptable tolerance for hole center-to-center spacing is ± 0.5 mm from the nominal dimension. Hole depth must be within ± 0.3 mm of the specified depth. Any deviation beyond these limits constitutes a defect requiring corrective action.

2.0 Required Tools & Gauges

- Digital caliper (0-150 mm range, resolution 0.01 mm)
- Depth gauge or depth micrometer (0-25 mm range)
- Shelf pin hole location template or jig (calibrated to nominal dimensions)
- Set of go/no-go pin gauges (for hole diameter verification)
- Marking pen (non-permanent) for flagging defects
- Inspection log sheet or digital QA form (ShopDocs)

3.0 Safety & Material Handling

- Wear safety glasses to protect against dust and debris from drilled panels.
- Handle panels with clean, dry hands or gloves to avoid oil transfer and surface contamination.
- Place panels on a flat, stable inspection table to prevent warping or damage during measurement.
- Use proper lifting techniques for large or heavy panels to prevent strain or injury.

4.0 Step-by-Step Procedure

1. Retrieve the panel from the CNC drilling station and place it on the inspection table with the drilled face up.
2. Visually inspect the panel for any obvious defects such as chipping, tear-out, or missing holes. Record any visual defects immediately.
3. Select the appropriate shelf pin hole location template or jig that matches the nominal hole pattern for the panel.
4. Align the template over the first row of shelf pin holes, ensuring it sits flush against the panel edge or reference datum.
5. Using the digital caliper, measure the distance from the panel edge to the center of the first hole in the row. Record the measurement.
6. Measure the center-to-center distance between the first and second holes in the same row using the caliper. Repeat for all consecutive holes in the row. Record each measurement.
7. Insert the depth gauge into the first hole and measure the depth. Ensure the gauge is perpendicular to the panel surface. Record the depth.

8. Repeat steps 5 through 7 for all remaining rows of shelf pin holes on the panel.
9. Compare all recorded measurements against the nominal dimensions and tolerance limits specified in the engineering drawing or work order.
10. If any measurement falls outside the ± 0.5 mm tolerance for location or ± 0.3 mm for depth, mark the defective hole(s) with a non-permanent marker and flag the panel for rework or rejection.
11. Document all measurements and any defects in the inspection log or ShopDocs QA module.
12. If the panel passes all measurements, stamp or label it as approved and move it to the assembly area. If it fails, follow the defect reporting procedure in Section 5.0.

5.0 Verification & Defect Reporting

1. Verify that all measurements have been recorded and compared against the nominal dimensions and tolerances. Confirm that the inspection log is complete and signed by the QA inspector.
2. If a defect is identified (location or depth out of tolerance), immediately attach a red tag to the panel with the defect description, date, and inspector initials.
3. Segregate the red-tagged panel in the designated non-conforming material area to prevent accidental use in assembly.
4. Notify the CNC operator and shift supervisor of the defect. Provide the specific measurement data to assist in root cause analysis.
5. For panels with minor location deviations (within 0.5 mm of tolerance), the QA manager may authorize re-drilling or plugging and re-drilling per the rework procedure. Document the rework action.
6. For panels with major deviations (exceeding 1.0 mm) or multiple defects, the panel must be scrapped. Complete a non-conformance report and submit it to the production manager for process improvement.
7. Log all defects and corrective actions in the ShopDocs QA module for trend analysis and continuous improvement.

Regulatory Disclaimer: This document is a generic quality assurance template. The end-user assumes all liability for validating all dimensional tolerances, testing procedures, and engineering specifications against actual production requirements before deployment.