

Dimensional Stability Test For Exterior Doors

1.0 Objective & Quality Standard

The objective of this procedure is to verify that each exterior door maintains dimensional stability under controlled conditions. The door must not exceed a width tolerance of $\pm 1.5\text{mm}$, a height tolerance of $\pm 2.0\text{mm}$, a diagonal squareness deviation of 2.0mm , and a twist (warp) of no more than 3.0mm measured across the face. This test ensures the door will fit properly in the frame and operate without binding or excessive gaps.

2.0 Required Tools & Gauges

- Digital Caliper (0-200mm range, 0.01mm resolution)
- Steel tape measure (3m, Class II accuracy)
- Feeler gauge set (0.05-1.00mm)
- Straightedge (1.5m, precision ground)
- Dial indicator with magnetic base (0-10mm range, 0.01mm resolution)
- Marking pencil (non-permanent)
- Inspection checklist (ShopDocs QA module)

3.0 Safety & Material Handling

- Wear cut-resistant gloves when handling door edges to prevent injury from sharp corners.
- Use a door cart or lifting straps for moving doors; never drag doors across the floor.
- Place doors on a clean, flat, level inspection table with protective padding to avoid surface damage.
- Ensure the inspection area is free of debris and clutter to prevent tripping hazards.

4.0 Step-by-Step Procedure

1. Place the exterior door horizontally on the inspection table with the interior face up. Ensure the door is fully supported along its length to prevent sagging.
2. Allow the door to acclimate to the inspection room environment for at least 30 minutes before testing (temperature $20\pm 2^\circ\text{C}$, humidity $45\pm 5\%$).
3. Using the steel tape measure, measure the door width at three locations: top (100mm from top edge), middle (midpoint), and bottom (100mm from bottom edge). Record each measurement to the nearest 0.5mm.
4. Measure the door height at three locations: left stile (100mm from left edge), center (midpoint), and right stile (100mm from right edge). Record each measurement to the nearest 0.5mm.
5. Check squareness by measuring both diagonals from opposite corners. Use the steel tape measure and record the difference between the two diagonal lengths. The difference must not exceed 2.0mm.

6. Place the straightedge across the door face at three positions: top panel, center panel, and bottom panel. Use the feeler gauge to measure the maximum gap between the straightedge and the door surface at each position. Record the largest gap.
7. Set up the dial indicator on the magnetic base at the center of the door. Zero the indicator on the door surface. Gently press down on each corner of the door and record the maximum deflection. This measures twist/warp.
8. Repeat steps 3 through 7 with the door flipped over (exterior face up) to check for asymmetry. Record all measurements on the inspection checklist.
9. Compare all recorded measurements against the tolerances specified in Section 1.0. Mark any out-of-tolerance dimensions with a red tag.
10. If the door passes all dimensional checks, sign and date the inspection checklist and move the door to the approved inventory area.

5.0 Verification & Defect Reporting

1. Verify that all measurements are within the tolerances: width $\pm 1.5\text{mm}$, height $\pm 2.0\text{mm}$, diagonal difference $\leq 2.0\text{mm}$, straightedge gap $\leq 3.0\text{mm}$, and twist $\leq 3.0\text{mm}$.
2. If any measurement exceeds the tolerance, attach a red tag to the door with the defect description, measured value, and operator initials.
3. Move the red-tagged door to the quarantine area and notify the QA supervisor immediately.
4. The QA supervisor will assess whether the door can be reworked (e.g., planing, sanding) or must be scrapped. Document the decision in the ShopDocs QA module.
5. Log all out-of-tolerance defects in the ShopDocs QA module for root cause analysis and continuous improvement tracking.

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.