

Drawer Box Bottom Groove Width Tolerance Verification

1.0 Objective & Quality Standard

The objective of this procedure is to ensure that the groove width machined into the drawer box sides and front/back panels is within the specified tolerance to guarantee a tight, flush fit of the bottom panel. A properly sized groove prevents the bottom from rattling, shifting, or failing under load, and ensures the drawer box remains square during assembly and use.

The acceptable tolerance for the groove width is the nominal bottom panel thickness plus 0.2 mm, with a maximum allowable deviation of ± 0.1 mm from this target. For example, for a 5.0 mm thick bottom panel, the groove width must measure between 5.1 mm and 5.3 mm.

2.0 Required Tools & Gauges

- Digital Caliper (0-150mm range, 0.01mm resolution) – calibrated and certified
- Go/No-Go Gauge set for groove width (custom-machined to target width +0.1mm and +0.3mm)
- Feeler Gauge set (0.05mm to 1.00mm)
- Magnifying lamp or inspection light for visual check
- Clean, lint-free cloth for wiping debris from groove
- ShopDocs QA module on tablet or mobile device for data entry

3.0 Safety & Material Handling

- Wear safety glasses to protect against wood dust and debris during inspection.
- Handle drawer box components with clean, dry hands or non-marring gloves to avoid transferring oils or dirt that could affect measurement accuracy.
- Place components on a stable, non-slip inspection table to prevent movement during measurement.
- Ensure the work area is well-lit and free of clutter to prevent tripping or dropping components.

4.0 Step-by-Step Procedure

1. Retrieve the drawer box component (side, front, or back panel) from the production batch and place it on the inspection table with the groove facing upward.
2. Visually inspect the groove for any obvious defects such as tear-out, burn marks, or debris. If debris is present, gently wipe the groove with a clean, lint-free cloth.
3. Select the Go/No-Go gauge set corresponding to the target groove width for the current bottom panel thickness.
4. Insert the Go side of the gauge into the groove. It should slide in with light finger pressure without forcing. If it does not enter, the groove is undersized and the component is non-conforming.
5. Insert the No-Go side of the gauge into the groove. It should NOT enter the groove. If it does, the groove is oversized and the component is non-conforming.

6. If the Go/No-Go gauge indicates a pass, proceed to measure the groove width at three locations along the length of the groove using the digital caliper: one measurement at each end (approximately 25 mm from the ends) and one measurement at the center.
7. Zero the digital caliper, then carefully insert the caliper jaws into the groove, ensuring they are perpendicular to the groove walls. Record each measurement to the nearest 0.01 mm in the ShopDocs QA module.
8. Calculate the average of the three measurements. The average must fall within the acceptable tolerance range (target width $+0.2 \text{ mm} \pm 0.1 \text{ mm}$). Additionally, no single measurement may deviate more than 0.15 mm from the target width.
9. If the groove width is within tolerance, mark the component with a green QA sticker and proceed to the next component.
10. If the groove width is out of tolerance, immediately red-tag the component with a non-conformance tag and place it in the designated rework or reject area.

5.0 Verification & Defect Reporting

1. All measurements and pass/fail status must be recorded in the ShopDocs QA module in real time. The system will automatically flag any out-of-tolerance readings.
2. For any non-conforming component, complete a non-conformance report (NCR) in ShopDocs, including the component ID, measured values, and the specific deviation.
3. If the groove is undersized (too tight), the component may be reworked by carefully sanding or routing the groove to the correct width, provided the groove depth and overall panel dimensions remain within specification. After rework, re-inspect per steps 4.4 through 4.9.
4. If the groove is oversized (too loose), the component cannot be reworked and must be scrapped. Record the scrap in ShopDocs for material yield tracking.
5. If three or more components from the same production run fail inspection, stop the production line and notify the shift supervisor and maintenance team to inspect the router or CNC tooling for wear or misalignment.
6. Conduct a root cause analysis using the ShopDocs QA module to identify whether the issue is tooling, material, or operator-related, and implement corrective actions before resuming production.

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.