Corner Joint Gap Measurement – Mitre Fold Assembly

1.0 Objective & Quality Standard

The objective of this procedure is to ensure that the corner joint gap on all mitre-folded assemblies meets the engineering specification of 0.5mm ± 0.2mm. A consistent gap prevents adhesive starvation, ensures proper alignment for subsequent finishing, and eliminates rework due to out-of-tolerance joints.

The quality standard is defined as: the gap between the two mitred faces at the corner joint shall be between 0.3mm and 0.7mm when measured at three points along the joint length. Any measurement outside this range constitutes a defect requiring immediate corrective action.

2.0 Required Tools & Gauges

- Digital Caliper (0-150mm range, resolution 0.01mm) – calibrated and certified
- Metric feeler gauge set (0.05mm to 1.00mm) – clean and free of burrs
- Go/No-Go gap gauge (0.3mm and 0.7mm) – optional but recommended for high-volume checks
- Non-marring inspection probe (plastic or brass) – to avoid scratching the finish
- Inspection light (LED penlight or task light) – for visual confirmation of gap uniformity
- Calibration log sheet or digital QA form (ShopDocs) – for recording measurements
- Clean lint-free cloth – to wipe joint area before measurement

3.0 Safety & Material Handling

- Wear clean, rubber-grip gloves to prevent oil or dirt transfer onto the finished surfaces.
- Place the mitre-fold assembly on a non-marring inspection mat to avoid scratching the outer faces.
- Handle the assembly with two hands to prevent twisting or stressing the joint before measurement.
- Ensure the work area is well-lit and free of clutter to avoid accidental damage to the part.
- Do not use excessive force when inserting feeler gauges – the gauge should slide in with light resistance only.

4.0 Step-by-Step Procedure

1. Visually inspect the mitre-fold joint for any obvious gaps, adhesive squeeze-out, or surface damage. If adhesive is present, carefully remove it with a plastic scraper before proceeding.
2. Wipe the joint area with a clean lint-free cloth to remove dust, debris, or moisture that could affect the measurement.
3. Place the assembly on a flat, stable inspection surface with the corner joint facing upward and accessible.
4. Select the 0.5mm feeler gauge from the set. Ensure the gauge is clean and free of bends or nicks.
5. Insert the 0.5mm feeler gauge into the gap at the top of the joint (approximately 10mm from the corner edge). The gauge should slide in with light resistance but not be loose. If it fits without resistance, the gap is too large; if it does not enter, the gap is too small.

6. Repeat the feeler gauge check at the middle of the joint (approximately halfway along the mitre length) and at the bottom of the joint (approximately 10mm from the opposite corner edge). Record each result as 'Pass' (0.3mm to 0.7mm) or 'Fail'.

7. For a more precise measurement, use the digital caliper. Zero the caliper, then gently insert the depth rod into the gap at the same three locations. Read the measurement to 0.01mm and record the value.

8. If using a Go/No-Go gauge, first insert the 0.3mm (Go) side – it must enter the gap freely. Then insert the 0.7mm (No-Go) side – it must not enter the gap. If either condition fails, the joint is out of tolerance.

9. Visually inspect the joint under the inspection light to ensure the gap is uniform along the entire length. Any visible taper or waviness indicates a misalignment issue.

10. Record all measurements and observations in the ShopDocs QA form or calibration log sheet. Include the operator name, date, time, and any notes about the assembly condition.

11. If the gap is within tolerance (0.3mm to 0.7mm) at all three points, mark the assembly as 'Accepted' and proceed to the next operation.

12. If any measurement is outside tolerance, immediately flag the assembly with a red tag and place it in the designated rework area. Do not continue processing the assembly.

5.0 Verification & Defect Reporting

1. After completing the measurement, verify that the recorded values match the actual gap by having a second operator (or QA lead) re-measure the joint at the same three points. This cross-check ensures measurement accuracy.

2. If the gap is out of tolerance (less than 0.3mm or greater than 0.7mm), determine the root cause: check for debris in the joint, incorrect mitre angle, adhesive squeeze-out, or clamping pressure issues during assembly.

3. For gaps smaller than 0.3mm: the joint may be too tight. Attempt to gently separate the faces using a plastic wedge. If the faces are bonded, the assembly must be scrapped or reworked per engineering instructions.

4. For gaps larger than 0.7mm: the joint is too loose. Apply additional adhesive and clamp the assembly with the correct pressure. Re-measure after the adhesive cures.

5. If the gap is non-uniform (tapered or wavy), inspect the mitre saw or folding equipment for calibration issues. Report the equipment deviation to maintenance immediately.

6. Log all out-of-tolerance defects in the ShopDocs QA module, including the measurement values, location, and corrective action taken. This data is used for root cause analysis and continuous improvement.

7. If the same defect occurs on more than 5% of assemblies in a single shift, initiate a stop-work order and escalate to the production supervisor and QA manager.