Edgeband Tape Shrinkage Test Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to verify that the edgeband tape (PVC, ABS, or PP) and its adhesive system do not exhibit excessive shrinkage when subjected to a controlled thermal cycle. Excessive shrinkage can cause joint failure, gaps, and aesthetic defects in finished panels. This test is performed on each new roll of edgeband tape before it is put into production, and then weekly on a sample from the active roll.

Frequency: Upon receipt of each new roll of edgeband tape, and then every 40 hours of machine runtime (weekly) on a sample from the roll currently loaded on the edgebander.

2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Disconnect the edgebander from main power and apply a personal lockout tagout device to the disconnect switch.
- Pneumatic Isolation: Close the main compressed air supply valve to the machine and bleed any residual pressure from the system by actuating a manual valve or opening a drain cock.
- Thermal Hazard: Allow the glue pot, pre-heater, and pressure roller to cool to below 40°C before accessing the tape path. Use a non-contact infrared thermometer to verify.
- PPE: Wear cut-resistant gloves (ANSI A4 or higher) when handling edgeband tape and test samples. Safety glasses with side shields are mandatory. Use heat-resistant gloves when handling samples from the oven.

3.0 Required Tools, Parts & Lubricants

- Digital caliper (0-150mm, resolution 0.01mm) – calibrated within the last 12 months.
- Steel rule (300mm, graduated in 0.5mm).
- Convection oven capable of maintaining 70°C ± 2°C.
- Non-contact infrared thermometer (calibrated).
- Sharp utility knife or scissors for cutting tape samples.
- Clean, flat aluminum or glass plate (at least 300mm x 100mm).
- Masking tape (low-tack) to secure samples.
- Timer or stopwatch.
- Edgeband tape sample from the roll under test (minimum 300mm length).

4.0 Step-by-Step Maintenance Procedure

1. Cut a 300mm ± 1mm length of edgeband tape from the roll. Use a steel rule and sharp knife to ensure a clean, square cut at both ends.
2. Place the tape sample on the clean aluminum or glass plate, adhesive side down. Secure both ends with a small piece of low-tack masking tape to prevent curling, but do not stretch the tape.

3. Using the digital caliper, measure the initial length of the tape sample to the nearest 0.01mm. Record this as L_initial. Measure at the centerline of the tape width.

4. Preheat the convection oven to 70°C ± 2°C. Verify the temperature with the infrared thermometer at the center of the oven shelf.

5. Place the plate with the tape sample into the preheated oven. Start the timer. The sample must be exposed to 70°C for 60 minutes ± 2 minutes.

6. After 60 minutes, remove the plate from the oven using heat-resistant gloves. Place it on a heat-resistant surface and allow it to cool to room temperature (20-25°C) for at least 30 minutes. Do not disturb the tape during cooling.

7. Once cooled, measure the final length of the tape sample at the same centerline position using the digital caliper. Record this as L_final.

8. Calculate the shrinkage percentage using the formula: Shrinkage (%) = ((L_initial - L_final) / L_initial) * 100. Record the result on the PM work order.

9. Compare the calculated shrinkage to the OEM specification for the tape material. Typical acceptable limits: PVC ≤ 1.5%, ABS ≤ 1.0%, PP ≤ 2.0%. If no OEM spec is available, use a general maximum of 1.5%.

10. If the shrinkage exceeds the acceptable limit, flag the roll as non-conforming. Remove it from the edgebander and quarantine it. Notify the production supervisor and quality manager. Do not use the tape for production.

11. If the shrinkage is within limits, re-label the roll with the test date and result. The roll is approved for production use.

12. Clean the test plate and tools. Return the oven to standby or off state. Dispose of the tested tape sample.

5.0 Verification & Return to Service

1. Ensure the edgebander is still locked out and tagged out. Verify that no tools or test materials remain on or near the machine.

2. Remove the LOTO devices in reverse order: close electrical enclosure, remove personal lock, restore main power. Open the compressed air supply valve.

3. Perform a warm-up cycle per the edgebander's standard startup procedure. Allow the glue pot and pre-heater to reach operating temperature.

4. Run a test panel with a short piece of the approved tape. Visually inspect the bond line for gaps, lifting, or adhesive squeeze-out. Verify that the tape adheres fully along the panel edge.

5. If the test panel passes visual inspection, the edgebander is cleared for production. Sign off on the PM work order in ServiceGrid, attaching the shrinkage test data.