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# Edgebanding Tension Test On Thin Panels – Preventative Maintenance SOP

## 1.0 Maintenance Objective & Frequency

The objective of this procedure is to verify that the edgebanding adhesive bond on thin panels (substrate thickness  $\leq 3\text{mm}$ ) meets the minimum tensile strength required to prevent edge lifting, delamination, or failure during handling and final assembly. This test is performed as a quality assurance check on the edgebanding machine's glue application system, pressure roller settings, and temperature profile.

Frequency: Perform this test at the start of each production shift when running thin panels, or whenever a change in adhesive batch, panel material, or edgebanding tape is introduced. Additionally, perform a full calibration check every 500 operating hours or quarterly, whichever comes first.

## 2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect main power to the edgebanding machine at the disconnect switch and apply a personal lock and tag.
- **Pneumatic Isolation:** Close the compressed air supply valve to the machine and bleed any residual pressure from the pneumatic lines by actuating the pressure release valve.
- **Thermal Hazard:** Allow the glue pot and heating elements to cool below  $40^{\circ}\text{C}$  before performing any hands-on adjustments or cleaning.
- **Mandatory PPE:** Wear safety glasses with side shields, cut-resistant gloves (ANSI A4 or higher), and closed-toe steel-toed boots. Hearing protection is required if the machine is still running during the test cycle.

## 3.0 Required Tools, Parts & Lubricants

- Digital force gauge (0-50 N range,  $\pm 0.1$  N accuracy) with a flat pull-tab attachment or clamp.
- Thin panel test coupons: 3mm thick MDF or particleboard, 100mm x 100mm, with edgebanding applied using the current production settings (same adhesive, same tape).
- Calibrated temperature probe (contact or infrared) for verifying glue pot and pressure roller temperatures.
- Feeler gauge set (0.05mm to 1.0mm) for checking pressure roller gap.
- Clean lint-free cloths and isopropyl alcohol (99%) for cleaning the test area and force gauge attachment.
- Torque wrench (5-25 Nm) with a 10mm hex bit for adjusting pressure roller mounting bolts if needed.

## 4.0 Step-by-Step Maintenance Procedure

1. Prepare the test coupon: Using the current production settings (glue temperature, feed speed, pressure roller force), apply a 100mm length of edgebanding tape to one edge of a 3mm thick MDF coupon. Allow the adhesive to cure for at least 2 minutes at room temperature.
2. Secure the test coupon in a vise or clamp fixture so that the edgebanding strip is oriented vertically and accessible for pulling.

3. Attach the force gauge's pull-tab clamp to the free end of the edgebanding tape, ensuring the clamp grips at least 10mm of the tape and is aligned perpendicular to the panel edge.
4. Zero the force gauge and then apply a steady, gradual pull perpendicular to the panel edge at a rate of approximately 10 mm per second. Record the peak force (in Newtons) at which the tape separates from the substrate.
5. Repeat the test on two additional coupons prepared under identical conditions. Calculate the average peak force. The acceptable minimum is 15 N for thin panels ( $\leq 3\text{mm}$  substrate) using standard EVA or PUR adhesive. If the average is below 15 N, proceed to the next step.
6. Check the glue pot temperature using the calibrated temperature probe. The setpoint should be within  $\pm 5^{\circ}\text{C}$  of the adhesive manufacturer's recommended application temperature (typically  $180\text{-}200^{\circ}\text{C}$  for EVA,  $120\text{-}140^{\circ}\text{C}$  for PUR). Adjust the thermostat if necessary.
7. Check the pressure roller gap using a feeler gauge. With the machine off and cooled, insert the 0.1mm feeler gauge between the pressure roller and the panel support surface. The gap should be  $0.1\text{mm} \pm 0.05\text{mm}$ . If not, loosen the roller mounting bolts with the torque wrench and adjust the eccentric cam or shims, then retorque to 12 Nm.
8. Check the pressure roller pneumatic pressure (if applicable). Using a pressure gauge at the regulator, verify the pressure is set to  $4.0\text{ bar} \pm 0.2\text{ bar}$ . Adjust the regulator if needed.
9. Clean the glue application roller and the pressure roller with a lint-free cloth and isopropyl alcohol to remove any adhesive buildup that could affect bond quality.
10. Repeat the tension test (steps 1-5) with three new coupons. If the average peak force now meets or exceeds 15 N, the calibration is successful. If not, inspect the glue nozzle for clogs, verify the adhesive batch is within its shelf life, and consider replacing the adhesive.

## 5.0 Verification & Return to Service

1. Restore power and compressed air to the machine following the reverse LOTO procedure. Remove all locks and tags, close the disconnect switch, and open the air supply valve.
2. Run a warm-up cycle for 5 minutes to bring the glue pot and rollers to operating temperature.
3. Produce a test panel using the same thin panel material and edgebanding tape that will be used in production. Visually inspect the edgebanding for uniform glue line, no gaps, and no lifting at the ends.
4. Perform a quick manual peel test on the test panel: attempt to lift the edgebanding by hand at the corner. It should resist peeling with moderate force (estimated  $>10\text{ N}$ ). If it peels easily, repeat the calibration procedure.
5. Document the test results (average peak force, temperature readings, pressure settings) in the ServiceGrid PM work order. Sign off on the work order and mark the machine as ready for production.

**Regulatory Disclaimer:** This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.