Wood Filler Shrinkage Test Standard Operating Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to verify the dimensional stability and shrinkage characteristics of wood filler batches to ensure consistent filling performance and minimize surface defects in finished wood products. This test is critical for quality control and should be performed on each new batch of wood filler prior to production use.

Frequency: Perform on every new batch of wood filler received from supplier or mixed in-house. Additionally, perform a quarterly audit on stored filler to detect any degradation over time.

2.0 Lockout/Tagout (LOTO) & Safety

- No electrical or mechanical lockout required for this test procedure.
- Ensure work area is well-ventilated to avoid inhalation of wood filler dust or fumes.
- Wear nitrile gloves to prevent skin contact with filler compounds.
- Wear safety glasses to protect eyes from splashes or airborne particles.
- Keep a fire extinguisher nearby as some fillers may contain flammable solvents.

3.0 Required Tools, Parts & Lubricants

- Digital caliper (0-150 mm, resolution 0.01 mm)
- Precision steel rule (300 mm)
- Test mold: rectangular cavity block (100 mm x 50 mm x 10 mm depth) made of non-porous material (e.g., aluminum or acrylic)
- Spatula or putty knife for applying filler
- Clean lint-free cloths
- Isopropyl alcohol (for cleaning mold)
- Wood filler sample (to be tested)
- Weighing scale (accuracy ±0.1 g)
- Oven or climate-controlled chamber set to 23°C ± 2°C and 50% ± 5% relative humidity

4.0 Step-by-Step Maintenance Procedure

1. Clean the test mold thoroughly with isopropyl alcohol and a lint-free cloth to remove any residue from previous tests.
2. Weigh the empty, clean mold on the scale and record the mass as M_mold (grams).
3. Using the spatula, fill the mold cavity completely with the wood filler sample, ensuring no air pockets are trapped. Overfill slightly to allow for leveling.
4. Immediately after filling, scrape the excess filler flush with the top surface of the mold using the steel rule, creating a flat, uniform surface.

5. Weigh the filled mold and record the mass as M_filled (grams). Calculate the initial filler mass: M_filler_initial = M_filled - M_mold.

6. Place the filled mold in the climate-controlled chamber (23°C, 50% RH) for 24 hours to allow the filler to cure and shrink under controlled conditions.

7. After 24 hours, remove the mold from the chamber. Using the digital caliper, measure the length and width of the filler surface at three points each (both ends and center) and record the average dimensions. Also measure the depth of the filler at the center of the cavity using a depth gauge or caliper.

8. Calculate the volume of the cured filler using the average dimensions: V_cured = length_avg × width_avg × depth_avg (mm³). Compare to the original mold volume (100 mm × 50 mm × 10 mm = 50,000 mm³).

9. Calculate the shrinkage percentage: Shrinkage (%) = [(V_mold - V_cured) / V_mold] × 100. Acceptable shrinkage is typically less than 5% for most wood filler applications; refer to product specification for exact limit.

10. Weigh the cured filler (still in mold) and record as M_cured. Calculate mass loss: Mass loss (%) = [(M_filler_initial - (M_cured - M_mold)) / M_filler_initial] × 100. This indicates solvent evaporation.

11. Visually inspect the cured filler surface for cracks, pinholes, or uneven shrinkage. Document any defects.

12. Clean the mold thoroughly with isopropyl alcohol and store in a clean, dry location.

5.0 Verification & Return to Service

1. Compare the calculated shrinkage percentage and mass loss against the acceptable limits defined by the filler manufacturer or internal quality standards.

2. If results are within specification, the batch is approved for production use. Update the batch record and sign off on the quality control log.

3. If results exceed acceptable limits, quarantine the batch, label it as non-conforming, and initiate a corrective action request. Do not release the batch for production.

4. Document all measurements and observations in the maintenance log or CMMS (e.g., ServiceGrid) for traceability.

5. Return the test mold and tools to their designated storage area.