

Spray Gun Pattern Test Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to verify and calibrate the spray pattern of pneumatic spray guns used in coating operations. A consistent, uniform pattern is critical for achieving specified film thickness, minimizing overspray, and preventing defects such as runs, sags, or orange peel. This test shall be performed at the start of each production shift, after any nozzle or air cap change, and whenever a finish defect is suspected.

Frequency: Daily (shift start) and on-demand (after maintenance or defect observation).

2.0 Lockout/Tagout (LOTO) & Safety

- **Pneumatic Isolation:** Close the main compressed air supply valve to the spray booth and bleed any residual pressure from the line by triggering the gun into a grounded waste container.
- **Electrical Isolation:** Disconnect and lock out the booth exhaust fan and any conveyor or turntable power if the gun is mounted on an automated system.
- **Mandatory PPE:** Wear chemical-resistant gloves, safety glasses, and a NIOSH-approved respirator suitable for the coating material being used. Ensure the spray booth ventilation is active before any test firing.

3.0 Required Tools, Parts & Lubricants

- Spray gun test pattern paper (white bond paper, 8.5 x 11 inches or larger) or a dedicated pattern test board.
- Coating material (same as production, thinned to specification if required).
- Pressure gauge (0-100 psi, calibrated within the last 12 months).
- Spray gun cleaning kit (solvent, brushes, lint-free cloths).
- Ruler or measuring tape (metric or imperial, as per OEM spec).
- Flashlight or inspection light.
- OEM spray gun manual (for specific pattern width and air pressure settings).

4.0 Step-by-Step Maintenance Procedure

1. Ensure the spray booth ventilation is operating and the area is free of ignition sources. Confirm LOTO is applied to any automated systems.
2. Attach the pressure gauge to the gun inlet or the air line quick-connect. Verify the incoming air pressure matches the OEM specification (typically 30-50 psi for HVLP guns). Adjust the regulator if necessary.
3. Fill the gun cup or connect the pressure pot with the production coating material. Ensure the fluid tip and air cap are clean and correctly installed per the OEM manual.
4. Set the fluid control knob to the fully open position (or the standard production setting). Set the fan pattern control knob to the mid-range position.

5. Hold the gun perpendicular to the test paper at the specified spray distance (typically 6-8 inches for HVLP). Trigger a quick, full burst (approximately 1 second) while moving the gun smoothly across the paper.
6. Inspect the pattern immediately. A correct pattern should be an even, elongated oval with a uniform distribution of paint. The width should match the OEM specification (e.g., 8-10 inches at 8 inches distance).
7. If the pattern is heavy in the center (dog-boning) or has a split (hourglass shape), adjust the air cap alignment. Loosen the retaining ring, rotate the air cap 90 degrees, retighten, and repeat the test. If the problem persists, clean or replace the air cap.
8. If the pattern is too narrow or too wide, adjust the fan pattern control knob incrementally (1/4 turn) and retest until the desired width is achieved. Record the final setting.
9. If the pattern shows spitting or tails, check for a loose fluid tip, dried paint in the nozzle, or incorrect fluid needle seating. Disassemble, clean with solvent, and reassemble. Retest.
10. Once the pattern is uniform, perform a final test on a vertical surface (if applicable) to check for runs or sags. Adjust fluid flow or air pressure as needed, staying within OEM limits.
11. Clean the gun thoroughly using the manufacturer's recommended procedure to prevent paint drying in the passages. Store the gun in a clean, dry location.

5.0 Verification & Return to Service

1. Remove the pressure gauge and reconnect the gun to the production air line. Verify the air pressure at the gun inlet matches the calibrated setting.
2. Spray a test part (scrap or production sample) using the standard production parameters. Inspect the finish for uniformity, gloss, and absence of defects.
3. If the test part passes quality inspection, remove LOTO from any automated systems and return the gun to production service.
4. Document the test results, including pattern width, air pressure, and any adjustments made, on the PM work order in ServiceGrid. Note the date, time, and technician name.
5. If the pattern cannot be corrected after two adjustment attempts, tag the gun as 'Out of Service' and initiate a repair work order. Do not use the gun 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.