Spray Gun Fluid Tip Wear Inspection & Replacement

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect the fluid tip of an industrial spray gun for wear, erosion, or damage that can cause inconsistent spray patterns, poor atomization, and finish defects. Worn tips must be replaced to maintain coating quality and reduce material waste.

Frequency: Perform this inspection every 40 hours of spray gun operation or weekly, whichever comes first. Replace the fluid tip if wear exceeds 0.001 inches (0.025 mm) on the orifice diameter or if visual damage is present.

2.0 Lockout/Tagout (LOTO) & Safety

- Pneumatic Isolation: Disconnect the compressed air supply line at the quick-connect fitting and bleed any residual pressure from the gun body by pulling the trigger.
- Fluid Isolation: Remove the paint cup or disconnect the fluid hose and purge the gun of any remaining coating material into a waste container.
- Mandatory PPE: Wear chemical-resistant gloves (nitrile or neoprene) to avoid skin contact with paint residues. Safety glasses with side shields are required to protect against splashes.
- Ventilation: Ensure the work area is well-ventilated or use a local exhaust system to capture solvent vapours released during cleaning.

3.0 Required Tools, Parts & Lubricants

- Spray gun manufacturer's service manual (for tip removal and torque specs)
- Replacement fluid tip (OEM part number matching gun model)
- 0-1 inch outside micrometer with 0.0001 inch resolution (or digital caliper with 0.0005 inch resolution)
- 10x jeweler's loupe or magnifying glass
- Soft, lint-free cloths (e.g., microfiber)
- Spray gun cleaning solvent (compatible with coating material)
- Small flathead screwdriver or tip removal tool (per manufacturer)
- Torque wrench (inch-pound range, 0-50 in-lb)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Ensure the spray gun is disconnected from air and fluid supplies and has been purged of coating material.
2. Remove the air cap by unscrewing it counterclockwise. Set it aside on a clean, lint-free cloth to prevent damage.
3. Using the appropriate tool (e.g., small flathead screwdriver or manufacturer-specific tip wrench), carefully unscrew the fluid tip from the gun body. Turn counterclockwise. Note the orientation and any sealing washer or O-ring.

4. Clean the removed fluid tip thoroughly with spray gun cleaning solvent and a soft cloth. Remove all paint residue from the orifice and external surfaces. Allow to dry completely.

5. Visually inspect the fluid tip under the 10x loupe for: nicks, scratches, burrs, erosion (especially at the orifice edge), or deformation. If any damage is visible, proceed to Step 8 for replacement.

6. Using the micrometer, measure the orifice diameter at three different orientations (0°, 120°, 240°) and record the average. Compare to the manufacturer's nominal diameter. If the average diameter exceeds the nominal by more than 0.001 inches (0.025 mm), the tip is worn and must be replaced.

7. If the tip passes both visual and dimensional inspection, reinstall it. Apply a light film of clean solvent to the threads, hand-tighten until snug, then torque to the manufacturer's specification (typically 15-25 in-lb). Do not overtighten.

8. If replacement is required, discard the worn tip. Install the new OEM fluid tip. Apply a light film of clean solvent to the threads, hand-tighten until snug, then torque to the manufacturer's specification (typically 15-25 in-lb).

9. Reinstall the air cap, hand-tightening it until snug. Do not use tools on the air cap.

10. Reconnect the fluid supply and air line. Perform a short pressure test by pulling the trigger with the gun pointed into a waste container to ensure no leaks at the tip or air cap.

5.0 Verification & Return to Service

1. Load the spray gun with the production coating material and perform a test spray pattern on a piece of scrap material or test panel.

2. Verify the spray pattern is uniform, free of tails, streaks, or spitting. The atomization should be consistent across the fan width.

3. If the pattern is acceptable, clean the gun exterior with solvent and return it to the production tool crib or operator.

4. Record the inspection results (pass/fail, measured orifice diameter, replacement part number if applicable) in the CMMS work order. Sign off on the PM in ServiceGrid.