
Electrostatic Powder Coating Gun Cleaning and Color Changeover Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to thoroughly clean the electrostatic powder coating gun assembly and powder feed system to prevent color cross-contamination during color changeovers. Proper cleaning ensures consistent powder flow, uniform coating thickness, and reduces the risk of electrostatic discharge issues. This procedure is performed every time a color change is required, or at minimum after every 8 hours of continuous operation.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect the main power supply to the powder coating booth and gun control unit. Apply a personal lock and tag.
- **Pneumatic Isolation:** Close the compressed air supply valve to the powder feed system. Bleed residual air from the gun and hoses by triggering the gun manually.
- **Electrostatic Discharge:** Ground the gun electrode by touching it to a grounded metal surface before handling. Wait 30 seconds for any residual charge to dissipate.
- **Mandatory PPE:** Wear nitrile gloves, safety glasses with side shields, and a NIOSH-approved N95 respirator to avoid inhalation of fine powder particles.

3.0 Required Tools, Parts & Lubricants

- Powder coating gun cleaning kit (includes nozzle brush, electrode brush, and tube brush)
- Lint-free wipes (Kimwipes or equivalent)
- Isopropyl alcohol (99% concentration) in a spray bottle
- Compressed air gun with nozzle (max 90 psi)
- Vacuum cleaner with HEPA filter and crevice tool
- Replacement powder feed hose (if worn or damaged)
- Replacement gun electrode tip (if worn or damaged)
- Anti-static spray (optional, for plastic components)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify zero energy state by attempting to trigger the gun and checking the control panel display for power-off condition.
2. Remove the powder feed hose from the gun inlet and from the powder hopper. Place the hose ends into a clean container to catch any residual powder.
3. Disassemble the gun nozzle by unscrewing the retaining ring. Remove the nozzle, deflector, and electrode tip. Place all parts on a clean lint-free wipe.

4. Using the nozzle brush, scrub the inside of the nozzle and deflector to remove all powder residue. Follow with a compressed air blow-off at 60 psi to dislodge any remaining particles.
5. Clean the electrode tip with the electrode brush. Inspect the tip for wear or damage; replace if the tip is bent, pitted, or has a worn point. Wipe the tip with isopropyl alcohol and a lint-free wipe.
6. Blow compressed air through the powder feed hose from one end to the other. Use short bursts to dislodge any powder buildup. If the hose is heavily contaminated, replace it with a new one.
7. Vacuum the interior of the powder hopper using the HEPA vacuum. Wipe down the hopper walls with a lint-free wipe dampened with isopropyl alcohol. Allow to air dry for 2 minutes.
8. Reassemble the gun: install the electrode tip, deflector, and nozzle. Tighten the retaining ring by hand until snug, then give an additional 1/8 turn with a wrench. Do not overtighten.
9. Reconnect the powder feed hose to the gun inlet and hopper. Ensure all connections are tight and free of leaks by gently tugging on the hose.
10. Spray the exterior of the gun body with anti-static spray (if using) and wipe down with a clean lint-free wipe to remove any static charge that could attract powder.

5.0 Verification & Return to Service

1. Remove LOTO devices and restore power and compressed air to the system.
2. Load the new color powder into the hopper. Set the gun control parameters to the standard settings for that powder type (voltage, current, air pressure).
3. Perform a test spray onto a scrap metal panel for 5 seconds. Verify that the powder flow is consistent, the spray pattern is uniform, and there is no visible contamination from the previous color.
4. Check the gun electrode for proper corona discharge by observing a faint blue glow at the tip when the gun is triggered (visible in low light). If no glow is seen, inspect the electrode connection and replace if necessary.
5. If the test spray shows contamination (streaks, specks of old color), repeat the cleaning procedure from Step 4.2. If the test spray is clean, sign off on the PM work order in ServiceGrid and return the gun to 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.