Preventative Maintenance & Calibration for Solvent-Based Contact Cement Application Equipment

1.0 Maintenance Objective & Frequency

The objective of this procedure is to ensure the consistent and reliable application of solvent-based contact cement by maintaining spray guns, roller coaters, and associated fluid delivery systems. This PM prevents nozzle clogging, uneven adhesive deposition, solvent vapor leaks, and ensures the adhesive is applied within the specified wet film thickness (WFT) range. Proper calibration directly impacts bond strength and reduces material waste.

Frequency: This PM is to be performed every 40 operating hours or weekly, whichever comes first. A full calibration and system inspection is required every 200 operating hours or monthly.

2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Disconnect the main power supply to the spray booth exhaust fan, conveyor system, and any automated applicator controls. Apply a personal lock and tag.
- Pneumatic Isolation: Close the main compressed air supply valve to the spray gun or roller coater. Bleed residual air from the line by triggering the gun or opening the regulator bleed valve.
- Solvent Vapor Hazard: Ensure the spray booth ventilation system is operational and the area is free of explosive concentrations. Use a calibrated combustible gas detector before and during maintenance.
- Mandatory PPE: Wear solvent-resistant gloves (nitrile or neoprene), safety glasses with side shields, a chemical-resistant apron, and a NIOSH-approved organic vapor respirator (e.g., 3M 6000 series with 6001 cartridges).

3.0 Required Tools, Parts & Lubricants

- 0-2 inch Wet Film Thickness (WFT) gauge
- Digital micrometer (0-1 inch, 0.001 inch resolution)
- Spray gun nozzle cleaning kit (brass brush, nozzle reamer, solvent-resistant wipes)
- Methyl Ethyl Ketone (MEK) or OEM-recommended solvent for flushing
- Replacement spray gun needle and seat kit (OEM part number as per machine manual)
- Replacement roller coater doctor blade (if applicable)
- PTFE thread seal tape
- Torque wrench (0-50 in-lbs range)
- Combustible gas detector (calibrated)
- Clean, lint-free rags

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify zero energy state by attempting to start the applicator and conveyor.

2. For spray guns: Remove the fluid nozzle and air cap. Soak them in MEK for 10 minutes. Use the brass brush and reamer to remove any dried cement from the orifice and air passages. Inspect for wear or damage; replace if the orifice is worn beyond OEM tolerance (typically 0.002 inch oversize).

3. For spray guns: Remove the needle and packing assembly. Inspect the needle tip for flat spots or scoring. Replace the needle and seat if any damage is found. Lubricate the packing with a drop of light machine oil before reassembly.

4. For roller coaters: Remove the doctor blade and inspect for wear. Measure the blade thickness with a micrometer; replace if worn more than 0.010 inch from original specification. Clean the roller surface with MEK and a lint-free rag, rotating the roller by hand to expose all surfaces.

5. Inspect all fluid hoses for cracks, swelling, or solvent permeation. Replace any hose that shows signs of degradation. Tighten all fittings with a torque wrench to 25 in-lbs, using PTFE tape on threaded connections.

6. Check the fluid pressure regulator and gauge. Verify the gauge reads zero with the system isolated. If the gauge does not return to zero, replace it. Set the regulator to the OEM-specified pressure (typically 20-40 psi for spray guns, 5-10 psi for roller coaters).

7. Calibrate the wet film thickness: For spray guns, spray a test pattern onto a clean metal panel at the specified distance (8-12 inches). Immediately measure the WFT using the gauge. Adjust the fluid control knob to achieve the target WFT (e.g., 3-5 mils). For roller coaters, apply adhesive to a test panel and measure WFT; adjust the gap between the roller and doctor blade using the micrometer adjustment screws.

8. For automated systems: Verify the conveyor speed matches the setpoint using a tachometer. Adjust the variable frequency drive if the speed deviates by more than 2%.

9. Inspect the solvent vapor exhaust system. Ensure the exhaust duct is clear of adhesive buildup. Verify the airflow is at least 100 feet per minute across the booth opening using an anemometer.

10. Reassemble all components. Remove LOTO tags and locks. Restore power and compressed air.

5.0 Verification & Return to Service

1. Perform a test run using a scrap substrate. Verify the adhesive application is uniform with no streaks, spitting, or dry spots.

2. Measure the wet film thickness at three locations on the test piece. All readings must be within ±0.5 mils of the target value.

3. Check for solvent vapor leaks around all fittings and the spray gun packing using the combustible gas detector. Readings must be below 10% of the Lower Explosive Limit (LEL).

4. Allow the test piece to dry for the specified open time (typically 5-10 minutes). Perform a bond test by pressing two pieces together and checking for immediate grab and peel resistance.

5. If all checks pass, sign off on the PM work order in ServiceGrid. Record the WFT readings and any parts replaced in the maintenance log.