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# UV Curing Lamp Intensity Check & Calibration

## 1.0 Maintenance Objective & Frequency

The objective of this procedure is to measure and calibrate the UV curing lamp intensity to ensure it meets OEM specifications for optimal curing of adhesives, coatings, or inks. This prevents defects such as incomplete curing (tackiness, poor adhesion) or over-curing (brittleness, yellowing).

Frequency: Weekly or after every 200 hours of lamp operation, whichever comes first. Also perform after any lamp replacement or reflector cleaning.

## 2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect main power to the UV curing system at the disconnect switch. Apply personal lock and tag.
- **Thermal Hazard:** Allow lamp housing to cool for a minimum of 10 minutes after shutdown. Surface temperatures can exceed 200°C.
- **UV Radiation Hazard:** Never look directly at an energized UV lamp. Ensure all safety interlocks are functional. Wear UV-blocking safety glasses and full skin coverage.
- **Mandatory PPE:** UV-blocking safety glasses, heat-resistant gloves, long-sleeve lab coat or coveralls.

## 3.0 Required Tools, Parts & Lubricants

- UV Radiometer (e.g., EIT PowerPuck or equivalent) calibrated within the last 12 months
- Isopropyl alcohol (99%) and lint-free wipes for cleaning reflector and lamp envelope
- Replacement UV lamp (if intensity is below threshold)
- Torque wrench with appropriate bit for lamp retaining screws (typically 5mm hex)
- Digital thermometer for verifying lamp housing temperature

## 4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify zero energy state by attempting to start the UV system.
2. Allow lamp housing to cool for at least 10 minutes. Use digital thermometer to confirm housing temperature is below 40°C before proceeding.
3. Open the lamp access door or remove the protective cover. Inspect the reflector for dirt, debris, or oxidation. Clean with isopropyl alcohol and lint-free wipes if necessary.
4. Visually inspect the lamp envelope for cracks, blackening, or discoloration. If any defects are found, replace the lamp.
5. Remove the old lamp (if replacing) by loosening the retaining screws with the torque wrench. Install the new lamp, ensuring it is seated properly. Torque retaining screws to 2.5 Nm (or per OEM spec).
6. Close the lamp access door and re-energize the system per LOTO removal procedure.
7. Allow the lamp to warm up for 5 minutes to reach stable operating temperature.

8. Place the UV radiometer sensor at the typical cure distance (e.g., 25 mm from the lamp face) in the center of the cure zone. Record the intensity reading.
9. Compare the reading to the OEM minimum intensity specification (typically 500 mW/cm<sup>2</sup> for medium-pressure mercury lamps). If below spec, proceed to lamp replacement or reflector cleaning.
10. If intensity is within spec, record the value in the maintenance log. If lamp was replaced, re-measure after 1 hour of operation to confirm stabilization.

## 5.0 Verification & Return to Service

1. Run a test cure on a sample substrate using the standard process parameters. Verify full cure by performing a thumb twist test or solvent rub test as per quality standard.
2. Inspect the test sample for any signs of under-cure (tackiness) or over-cure (brittleness).
3. If test passes, remove LOTO tags and return the system to production. Update the PM work order in ServiceGrid with the intensity reading and any parts replaced.
4. If test fails, re-check lamp alignment and reflector condition. Repeat intensity measurement. If still failing, escalate to maintenance supervisor for further investigation.

**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.