

Tool Inventory and Portable Appliance Testing (PAT) for 110V Equipment

1.0 Maintenance Objective & Frequency

The objective of this procedure is to perform a comprehensive tool inventory and Portable Appliance Testing (PAT) on all 110V portable electrical equipment within the facility. This ensures that all tools are accounted for, electrically safe, and compliant with CSA Z462 and the Canadian Electrical Code. The procedure aims to prevent electrical shock hazards, fire risks, and equipment downtime due to faulty appliances. The required frequency is annual, with additional inspections following any reported damage or after repair.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Unplug all portable appliances from any power source before inspection and testing. Verify zero voltage using a calibrated voltage tester.
- **Personal Protective Equipment (PPE):** Wear CSA-approved safety glasses, insulated gloves (rated for 110V), and steel-toed boots. Use a non-conductive mat when testing.
- **Work Area:** Ensure the testing area is dry, clean, and free of flammable materials. Keep a fire extinguisher rated for electrical fires nearby.

3.0 Required Tools, Parts & Lubricants

- Portable Appliance Tester (PAT) device (e.g., Fluke 6500-2 or equivalent) with current calibration certificate.
- Calibrated voltage tester (e.g., Fluke T90) for verifying zero energy state.
- Tool inventory checklist or digital asset tracking system (e.g., ServiceGrid).
- Label maker with durable, heat-resistant labels (e.g., Brady BMP21).
- Inspection mirror and flashlight for visual inspection of plugs and cords.
- Replacement parts: 110V plugs (NEMA 5-15), cord connectors, strain reliefs, and cable ties.
- Non-conductive work mat.

4.0 Step-by-Step Maintenance Procedure

1. Gather all portable 110V appliances from the designated tool crib, workstations, and storage areas. Ensure no tools are left plugged in or energized.
2. Visually inspect each appliance for physical damage: cracks in the housing, frayed or cut cords, bent or missing prongs on the plug, and signs of overheating (discoloration, melting). Use the inspection mirror for hard-to-see areas.
3. Check the cord for integrity: ensure the outer jacket is intact, no exposed conductors, and the strain relief at both ends is secure. Gently flex the cord along its length to reveal hidden breaks.
4. Verify the plug is correctly wired: for NEMA 5-15, confirm the green/yellow wire is connected to the ground pin, white to the neutral (wide blade), and black to the hot (narrow blade). Tighten terminal screws to 0.5 Nm.

5. Connect the appliance to the PAT device. Select the appropriate test sequence for 110V Class I or Class II equipment as defined by the device manual.
6. Perform the earth bond test (for Class I equipment): apply a test current of 25A and measure resistance. The reading must be less than 0.1 ohms. Record the value.
7. Perform the insulation resistance test: apply 500V DC between live conductors and earth (or accessible conductive parts). The reading must be greater than 1.0 megohm. Record the value.
8. Perform the leakage current test: measure the current flowing from live parts to earth under normal operating conditions. The reading must not exceed 0.75 mA for Class I or 0.25 mA for Class II equipment. Record the value.
9. If the appliance passes all tests, affix a durable label indicating the test date, next due date, and technician ID. Update the tool inventory record in ServiceGrid with the test results and asset tag.
10. If the appliance fails any test, tag it as 'FAILED - DO NOT USE' with the failure reason. Remove it from service immediately and place it in the designated quarantine area for repair or disposal.
11. For each appliance, verify the asset tag or barcode matches the inventory list. Update the location and condition status in the digital inventory system.
12. Document any missing tools on the inventory checklist and report to the maintenance supervisor for investigation.

5.0 Verification & Return to Service

1. After testing, plug each passed appliance into a known-good 110V outlet and verify it operates correctly for 30 seconds. Listen for abnormal noises and check for excessive heat.
2. Confirm that all passed appliances are returned to their designated storage locations and that the inventory system reflects the updated status.
3. Review the PAT test results report generated by the tester or entered into ServiceGrid. Ensure all readings are within acceptable limits and that no failed units remain in circulation.
4. Sign off on the PM work order in ServiceGrid, attaching the test results file and noting any corrective actions taken for failed units.

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.