

Dust Collection Ductwork Leak and Static Pressure Check

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect all accessible dust collection ductwork for air leaks, structural integrity issues, and to verify that static pressure readings at key points (e.g., main trunk, branch lines, collector inlet) are within the OEM-specified range. Leaks reduce system efficiency, increase energy consumption, and can lead to combustible dust accumulation outside the ductwork. This PM is to be performed quarterly (every 3 months) or immediately after any ductwork modification or impact incident.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Lock out and tag out the main disconnect for the dust collection system fan motor. Verify zero energy state with a voltage tester.
- **Pneumatic Isolation:** If the system has pneumatic dampers or actuators, isolate and bleed the compressed air supply.
- **Mechanical Lockout:** Ensure the fan impeller is fully stopped (use a non-contact tachometer if necessary) before opening any access doors.
- **Confined Space:** If entering ductwork larger than 24 inches diameter, follow confined space entry procedures (atmospheric testing, retrieval system).
- **PPE:** Safety glasses, cut-resistant gloves, hearing protection (if near operating equipment), dust mask or respirator (if visible dust is present), and steel-toed boots.

3.0 Required Tools, Parts & Lubricants

- Digital manometer or magnehelic gauge (0-10 inches w.c. range)
- Static pressure probe (pitot tube or static pressure tip) with rubber tubing
- Smoke pencil or incense stick (for leak detection)
- Flashlight (high-lumen, rechargeable)
- Small mirror (for inspecting blind spots)
- Duct tape (temporary patch for small leaks)
- Silicone caulk or mastic sealant (for permanent leak repair)
- Caulking gun
- Wire brush (for cleaning surfaces before sealing)
- Rags or shop towels
- Notebook and pen (or tablet for digital logging)
- Camera (for documenting findings)

4.0 Step-by-Step Maintenance Procedure

1. Perform full LOTO on the dust collection system as per Section 2.0. Confirm zero energy state.

2. Visually inspect all accessible ductwork from the collection hoods to the collector inlet. Look for dents, holes, loose connections, missing fasteners, or signs of dust leakage (dust trails on duct exterior).
3. Using the smoke pencil or incense stick, slowly move it along all joints, seams, and flanges while observing smoke movement. A sudden deflection or suction indicates a leak. Mark each leak location with tape or a marker.
4. For each identified leak, clean the area with a wire brush and rag to remove dust and debris. Apply a bead of silicone caulk or mastic sealant over the gap. For larger holes (>1/4 inch), apply a patch of duct tape as a temporary fix and schedule a permanent repair.
5. Inspect all blast gates and dampers for proper operation. Ensure they open and close fully without binding. Lubricate pivot points with a dry-film lubricant if necessary.
6. Check all hanger straps and supports for tightness. Tighten any loose bolts or nuts. Replace any corroded or damaged supports.
7. Re-energize the system (remove LOTO) and allow it to reach normal operating conditions (e.g., all hoods open, collector running).
8. Using the digital manometer and static pressure probe, measure static pressure at the following locations: (a) main trunk line near the collector inlet, (b) at the farthest branch line from the collector, and (c) at the collector inlet flange. Record all readings in inches w.c.
9. Compare recorded static pressure readings to the OEM specifications (typically found in the system design manual or on the collector nameplate). Acceptable range is usually +/- 0.5 inches w.c. of the design value.
10. If any static pressure reading is outside the acceptable range, investigate for blockages (e.g., clogged filter bags, choked ductwork) or additional leaks. Clear blockages and re-measure. If readings remain out of spec, escalate to the maintenance supervisor.
11. Document all findings, including leak locations repaired, static pressure readings, and any anomalies. Take photos of repaired areas and gauge readings for the maintenance record.
12. Clean up all tools and materials. Dispose of any used sealant tubes and rags properly. Return the system to normal operation.

5.0 Verification & Return to Service

1. Confirm that all LOTO devices have been removed and the system is fully energized.
2. Run the dust collection system for at least 10 minutes with all hoods open. Listen for any unusual whistling or air noise that could indicate an unsealed leak.
3. Re-check static pressure at the collector inlet to ensure it remains stable within the acceptable range.
4. Visually verify that no dust is escaping from any repaired joints or seams.
5. Sign off on the PM work order in ServiceGrid, attaching all recorded data and photos. Note any follow-up actions required (e.g., permanent repair of taped holes).

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.