



## **Performance Tested Comfort Systems® Duct Technical Specifications**

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1. **Introduction and Scope:** This document sets forth the specifications for duct sealing in according to the Performance Tested Comfort Systems (PTCS) Program.
2. **All Testing** shall be done by a PTCS Certified Technician or Inspector.
3. **Duct System Diagnostic Procedures:** One or both of the following tests shall be used to measure the duct leakage in a system, unless otherwise specified in this document.
  - 3.1. **Total Duct Leakage Test** – According to the protocol set forth in the **PTCS Duct Testing Procedures**
  - 3.2. **Duct Leakage to Exterior Test**– According to the protocol set forth in the **PTCS Duct Testing Procedures**
4. **Sealing Materials and Duct Connections Definitions**
  - 4.1. Non-flex duct joints and connections shall be sealed with UL-181 listed mastic.
    - 4.1.1. The application of mastic shall be done properly, according to manufacturer specifications.
    - 4.1.2. Take offs and slip joints shall be mechanically secured with screws and sealed with mastic.
    - 4.1.3. Where service access is necessary, only UL-181 listed foil tape shall be used. The furnace to plenum connection is also allowed to be sealed with UL-181 listed foil tape.
    - 4.1.4. Cloth-backed duct tape shall not be used to seal, secure, or fasten ducts.
  - 4.2. Flexible duct connections shall have the interior and exterior liners secured and air-sealed with nylon straps (Panduit or equivalent) and tightened with a manufacturer-approved tensioning tool. Steel band clamps with worm drive tension adjusters also are acceptable.

## 5. Duct Connecting and Sealing Applicability

- 5.1. All accessible portions of the duct system shall be inspected for signs of leakage and soundness of materials. For new duct systems, the entire duct system is considered to be accessible.
  - 5.1.1. Accessible plenum connections and take-offs shall be exposed, properly connected and sealed.
  - 5.1.2. Accessible wyes, elbows and other duct connections shall be exposed, properly connected and sealed when they are found to show signs of leakage or poor fit.
    - 5.1.2.1.Exception: new duct systems shall have all connections between duct components properly connected and sealed.
  - 5.1.3. Flexible duct connections that have properly secured exterior liners may be considered to have interior liners that are not accessible.
    - 5.1.3.1.Exception: The inner liner on manufactured home crossover ducts shall be considered accessible.
- 5.2. Where a large section of duct insulation is removed, the insulation shall be re-installed and securely attached to the duct system. Recommended methods include the use of twine. Mastic will not effectively hold insulation in place.

## 6. Home and Duct System Types

- 6.1. **New Construction / New Ducts; Site or Manufactured Homes** – The home must be new construction and not have been occupied for more than 1 year.
  - 6.1.1. The duct leakage in a new home shall not exceed 6% of the floor area served by the system (0.06 x SF CFM50) or 75 CFM50, whichever is greater, as measured according to the testing protocols identified in 3.1 and/or 3.2.
    - 6.1.1.1. Exception 1- If the air handler is located completely within the conditioned space, it is not required to be in place during the test.
    - 6.1.1.2. Exception 2- If the air handler is located in unconditioned space, it is not required to be in place during the test, the leakage limit shall be decreased to 4% of the floor area served by the system (0.04 x SF CFM50) or 50 CFM50, whichever is greater.
  - 6.1.2. If a new airhandler is being installed, the total external static pressure acting on the system air handler should be tested with approved instruments and recorded at time of startup. A measured external static pressure of more than 0.8” (200 Pa) should cause installer to consider taking corrective measures with system ductwork.

## 6.2. Existing Home / New Ducts

- 6.2.1. In order to qualify as an existing home, it must be occupied for at least one year.
- 6.2.2. The air leakage of the duct system shall be measured before sealing the system, using either protocol identified in 3.1 and 3.2; and the **same** test shall be used to measure the leakage in the system after it is sealed.
  - 6.2.2.1. If a new section is being added to an existing duct system, no pre-test is necessary; and the final test for the entire system shall not exceed 10% of the floor area served by the system (0.10 x SF CFM50) or 75 CFM50, whichever is greater.
- 6.2.3. In order to certify the home under PTCS, the leakage in the duct system after sealing shall not exceed 10% of the floor area served by the system (0.10 x SF CFM50) or 75 CFM50, whichever is greater.
- 6.2.4. A home which meets these standards without additional sealing may be certified.
- 6.2.5. If a new air handler is being installed, the total external static pressure acting on the system air handler should be tested with approved instruments and recorded at time of startup. A measured external static pressure of more than 0.8" (200 Pa) should cause installer to consider taking corrective measures with system ductwork.

## 6.3. Existing Home / Existing Ducts

- 6.3.1. In order to qualify as an existing home, it must be occupied for at least one year.
- 6.3.2. The air leakage of the duct system shall be measured before sealing the system, using the protocol identified in 3.2: **Duct Leakage to the Exterior**.
- 6.3.3. In order to qualify, the measured leakage of the system after sealing, using the same test method as above, shall meet either of the following criteria:
  - 6.3.3.1. It shall not exceed 10% of the floor area served by the system (0.10 x SF CFM50) **OR**
  - 6.3.3.2. The measured leakage in the system after sealing measures have been done shall show a reduction of at least 50%.
- 6.3.4. In cases where return ducts are inaccessible, compliance with 6.3.3.1 or 6.3.3.2 may be accomplished by performing the Duct Leakage to the Exterior test on the supply side only (using the more stringent of the two – whichever is less).

## 6.4. Existing Manufactured Homes

- 6.4.1. The air leakage of the duct system shall be measured before sealing the system using the protocol identified in 3.2: **Duct Leakage to the Exterior**.

- 6.4.2. In order to be eligible for certification, the duct system must have a measured leakage of 50 CFM50 or less for single section homes, plus an additional 30 CFM50 allowed for each additional section.
- 6.4.3. If compliance with 6.4.2 is not possible, then the duct system leakage, after the sealing measures have been performed, shall document a 50% reduction using the same test as in 6.4.1.
- 6.4.4. If the final tested leakage rate is greater than that specified in 6.4.2, the air-handler transition-to-trunk duct connection shall be sealed.
- 6.4.5. Regardless of qualifying path, all accessible components of the duct system shall be sealed, including the crossover takeoff-to-trunk duct connections and crossover-to-crossover takeoff connections.

**7. Combustion Appliance Requirements (Does not apply if there is no combustion appliance)**

- 7.1. Whenever there is a Combustion Appliance present in the house, garage, or other attached space, a UL listed, C-UL listed, or equivalent carbon monoxide alarm shall be installed in accordance with the carbon monoxide alarm manufacturer's instructions.