



State of Ohio  
Weatherization Program  
Standards

Section	<b>DIAGNOSTIC TESTING METHODS</b>
Subject	<b>Distribution System Testing</b>

*DUCT TESTING PROCEDURES 1506-5*

Interview the occupants to determine whether there are areas that are over- or under-heated.	<b>interview occupants</b> 1506-5.1
Inspect duct system to determine location of ducts. It is important to determine if the duct system has runs outside of the heated envelope, uses building cavities as ducts, or has ducts running within the interstitial building cavities.	<b>inspect ducts</b> 1506-5.2
Identify all registers that terminate duct runs that run outside the envelope, are made of building cavities, or are located in interstitial cavities.	<b>identify registers</b> 1506-5.3
Determine if the duct zone is conditioned, unintentionally conditioned, or non-conditioned. Based on this determination, proceed as follows:	<b>basement</b> 1506-5.4
Temporarily seal registers in the duct zone. If there is a basement which is conditioned space, leave the basement door open, otherwise close the basement door.	<b>conditioned</b> 1506-5.4a
Temporarily seal registers in duct zone. If it is determined that the basement doesn't need to be heated then indicate on the work order to have them sealed permanently.	<b>unintentionally conditioned</b> 1506-5.4b
Temporarily seal registers in the duct zone and indicate on the work order to have them sealed permanently.	<b>non-conditioned</b> 1506-5.4c
Set up the blower door using established blower door test procedures and precautions (see 1506-1).	<b>set-up blower door</b> 1506-5.5
Depressurize the house to -50 Pa. Measure the pressure differential between the zone of the ducts and the main body of the house. If the pressure differential is less negative than -5.0 Pa., then the pressure differential must be magnified. A window or door of the zone in which the ducts are located, but which leads to the outside, should be opened to cause a larger pressure differential.	<b>depressurize house</b> 1506-5.5a

<b>cover registers</b> 1506-5.5b	One at a time, cover each register connected to the ducts identified above with a pressure pan, masking tape, or tape and paper. Use the easiest method based on the size, shape, and location of the register.
<b>measure pressure</b> 1506-5.5c	Measure the pressure difference across the register. Remove tape, paper, or pressure pan and move on to the next register.
<b>determine sealing sites</b> 1506-5.5d	A reading of 1 Pa or higher indicates a visual inspection of the boot, boot and floor intersection, and the duct will be needed to determine where the sealing will take place.
<b>turn off blower door</b> 1506-5.5e	When all registers have been tested, turn off the blower door and cap it.
<b>locate/seal leaks</b> 1506-5.5f	Turn on the air handler and using a smoke bottle, locate and seal all leaks. All return leaks in combustion appliance zone(s) and unconditioned spaces must be sealed. All supply leaks to unconditioned spaces must be sealed.
<b>turn off air handler</b> 1506-5.5g	Turn off the air handler.
<b>repeat</b> 1506-5.5h	Repeat the duct pressure test with the house to outside pressure at -25 Pa. The process must be repeated until all pressure readings at the registers are less than 1 Pa.
<b>Mobile Home Distribution System Leakage Test</b> 1506-5.6	Use the blower door based subtraction method to measure mobile home duct system leakage after the established blower door set-up procedure and precautions have been completed (see 1506-1).
<b>subtraction test limitations</b> 1506-5.6a	For the subtraction test to be accurate, there must be a pressure differential between the living area and the cavity where the mobile home ductwork is located. If there is little or no pressure difference between these two areas, there will be very little difference between the Taped Duct CFM50 and the Initial Duct CFM50. The most important tools in determining leakage in mobile home distribution systems are flashlights, drop lights, and mirrors. Check the ends of the distribution systems, the boot/floor connection, the boot/main duct connection, along with the connection between the furnace and the main duct.

Insert a tube, or probe attached to a tube, into the cavity between the mobile home floor and the belly board and measure the pressure difference of the living space WRT the cavity containing the duct system. The pressure difference must be greater than 5 Pa.

**measure the pressure  
across the floor**  
1506-5.6b

Perform an initial blower door test and record the result as the Initial CFM50. Then, seal all ducts at the supply registers and at the return air grill completely using tape, plastic film, sheets of paper or other temporary air-impermeable material. Assure that no air is moving through any openings from the return grill or supply registers. Examine the system to assure that all auxiliary or add-on air conditioner or heat pump grills are also sealed. Perform a blower door test and record as the Taped Duct CFM50.

**taped duct test**  
1506-5.6c

Subtract the Taped Duct CFM50 reading from the Initial CFM50 reading to determine the amount of air leakage through the distribution system.