



# Austin Energy Green Building Program Home Performance Testing For Single-Family Homes



See "Duct Diagnostics and Sealing Program Guidelines" in the Guide for further details.

Customer		Address of Tested Home		Test Date
Company				
Contact	Phone	Homeowner (optional)		
Mechanical Contractor		Testing Contractor		
Company		Company		
Contact	Phone	Technician	Phone	
Mechanical system designer if other than mechanical contractor			Phone	

### Blower Door Test

**Purpose of Test:** The blower door test ascertains the amount of air leakage through the house "envelope" (ceiling, walls, floor). It is measured by the number of natural air exchanges per hour between the inside and outside (ACHn). If the ACHn is lower than 0.35, a mechanical fresh-air ventilation system is recommended.

**Performing Test:**  
Test home at -50 pascals pressure.

Volume = Sq.ft. x average ceiling height

CFM at -50 pascals pressure

ACH 50 = CFM 50 x 60 / Volume

ACHn (natural) = ACH50 / n

n (natural) = 20 x H x S x L

n = ( 20 ) x ( ) x ( ) x ( ) =

ACHn (natural) = ACH50 / n

**Acceptable leakage: less than 0.50 ACH. If below 0.35 ACH, fresh-air mechanical ventilation with damper is recommended.**

<b>Square Footage of Home</b>	
<b>Average Ceiling Height</b>	
<b>Volume</b>	
<b>CFM -50</b>	
<b>ACH 50</b>	
<b>ACHn</b>	

<b>H = Height Factors</b>	<b>S = Wind Shielding</b>	<b>L = Leakiness</b>
1 Story = 1.0	Well shielded = 1.2	Better than average = 1.4
2 Story = 0.8	Normal = 1.0	Average = 1.0
3 Story = 0.7	Exposed = 0.9	

### Gas Appliance Safety Back-Draft Test

**Purpose of Test:** The safety back-draft test measures a home's negative pressure caused by supply-duct leaks and door closures. High negative pressure (> -3.0 pascals) can result in dangerous backdrafting of combustion appliance vents and fireplaces.

**Performing Test:** Stand at front door with a digital manometer. Run hose from reference port of the manometer to outside of the house. Tests b and c are done for reference purposes.

**Combustion appliances:**

<input type="checkbox"/>	Furnace	<input type="checkbox"/>	Fireplace
<input type="checkbox"/>	Water heater	<input type="checkbox"/>	Other (not including kitchen stove)

**No Backdraft Test needed:**

<input type="checkbox"/>	All electric house with no fireplace
<input type="checkbox"/>	Gas furnace/water heater/fireplace have external combustion or are outside living space

HVAC <u>off</u> , interior doors <u>open</u>	a	
HVAC <u>on</u> , interior doors <u>open</u>	b	
HVAC <u>on</u> , interior doors <u>closed</u>	c	
HVAC <u>on</u> , interior doors <u>closed</u> , all exhaust fans <u>on</u>	d	

**Acceptable range: > -3.0 pascals**

Test not needed

Customer 0  
 Mechanical Contractor 0

Address of Tested Home 0  
 Testing Contractor 0

**Air Duct System Air-Flow Testing (Copy this page for multiple systems.)**

**Purpose of Test:** The heating and cooling equipment is designed to deliver a given amount of heated or cooled air to the living space. The air-flow test measures the amount of air the system is delivering to each room and to the house as a whole, measured in cubic feet per minute (CFM). Incorrect temperatures at the registers may indicate insufficient air flow or inadequate duct insulation.

**Performing Test:** For Delta T calculation, HVAC system should be operating at least 15 minutes and outside temperature should be above 70 ° F.  
 The Sq. Ft. column does not include closets and hallways

**HVAC System Info**

This is System # :  Make:  Location of Air Handler:  Closet  Garage  Attic   
 Of \_\_\_ total # of systems:  Model:  Type of Air Handler:  Upflow  Downflow  Horizontal   
 System Tonnage:   
 (400 cfm x tons x 0.9 or equipment design cfm) **Design CFM:**  **Conditioned Space Square Footage:**   
 (16° to 22° F temperature range recommended) **HVAC Delta T:**  (Recommended for proper equipment operation) **Design CFM /sf:**  #DIV/0!

Room	Number of Outlets	Square Footage (excluding closets and hallways)	Design CFM	Actual measured CFM	Air Temperature	Comments
<b>Totals:</b>		<b>0</b>	<b>0</b>	<b>0</b>		<b>CFM/ton (total cfm/total system tonnage)</b> Final airflow: central AC between 350 cfm per ton; heat pump between 375 and 450 cfm per ton; or within manufacturer's equipment specifications measured over a wet coil)

**Static Pressure Testing**

**Purpose of Test:** To find out if the TASP (Total Air Static Pressure) is within the recommended range of water column. If so, the duct system is efficient and requires no further measurement, unless there are specific air-flow complaints.

**Central Air Conditioning**

**Heat Pump System**

Operating pressure entering furnace after air filter:   
 Operating pressure after heat-exchanger, before evaporator coil:

Operating pressure entering air handler after air filter:   
 Operating pressure exiting air handler at supply plenum:

TASP range: 0.6" to 0.7" of WC

TASP range: 0.4" to 0.5" of WC

**Return Air Sizing**

**Purpose of Test:** Correct sizing for return-air is a code requirement. A minimum of one square foot of net-free return-air-grille-area (NFA) is required per ton of air conditioning. Open the return-air grille and measure the area of the open space behind it. Multiply this area by 0.75 to get the approximate net-free-area of the grille (reasonably accurate for most grille styles).

**Performing Test:** To calculate Net Free Area, multiply grille area by .75 if grille is metal, by .25 if grille is wood. Subtract any blockages.

Open area behind grille in sq. inches a   
 Calculated Net Free Area b   
 Net Free Area in square feet (Divide b. by 144) c   
 Required NFA in sq. feet d

Additional Net Free Area of return air is recommended if c. is smaller than d.

**Duct Blower Leakage Test**

**Purpose of Test:** The duct blower test ascertains the amount of conditioned air leaking out of or into duct work (depending on whether the pressure is + or -). Leaks result in decreased comfort and efficiency, higher utility bills, and more moisture and dust in the living space.

**Performing Test:** To make measurement, turn the Duct Blower on and adjust fan speed until pressure reaches -25 Pascals or acceptable HVAC system operating Pascals. Record the duct leakage flow-rate reading from the digital manometer. Divide total leakage by total rated air-flow for percentage of duct system CFM loss.

Acceptable leakage of supply and return air combined: no greater than 10%. **CFM Leakage**  **% Leakage**