

BUILDING LEAKAGE TEST COMPARISON

Greenstone Solutions
1001 Boulders Parkway, Suite 300
Richmond, VA 23225
Phone: 804-615-2145
Fax: 804-560-1438

Test #1

Test File: No Climate Seal Window Inserts
Date of Test: 8/19/2010
Customer: Capital Inner Window
5004 West Clay Street
Richmond, VA 23230
Phone: 804-266-3967
Fax: 804-266-0710

Test #2

Test File: With Climate Seal Window Inserts
Date of Test: 8/19/2010
Customer: Capital Inner Window
5004 West Clay Street
Richmond, VA 23230
Phone: 804-266-3967
Fax: 804-266-0710

Test Results

	Test #1	Test #2	Change	Percent
1. Airflow at 50 Pascals:	11031 CFM 21.05 ACH	9163 CFM 17.49 ACH	-1868 CFM -3.57 ACH	-16.9 % -16.9 %
2. CFM50 per ft2 Floor Area	3.36 CFM/ft2	2.79 CFM/ft2	-0.57 CFM/ft2	-16.9 %
3. Leakage Areas:				
Canadian EqLA @ 10 Pa:	1138.9 in2	908.9 in2	-230.0 in2	-20.2 %
LBL ELA @ 4 Pa:	605.6 in2	472.4 in2	-133.2 in2	-22.0 %
4. Minneapolis Leakage Ratio: (CFM50 per ft2 Surface Area)	1.67	1.38	-0.28	-16.9 %

Infiltration Estimates

1. Estimated Annual Average Infiltration Rate:	618.9 CFM 1.18 ACH	482.8 CFM 0.92 ACH	-136.1 CFM -0.26 ACH	-22.0 % -22.0 %
2. Estimated Design Infiltration Rate:				
Winter:	873.5 CFM 1.67 ACH	681.4 CFM 1.30 ACH	-192.1 CFM -0.37 ACH	-22.0 % -22.0 %
Summer:	591.4 CFM 1.13 ACH	461.3 CFM 0.88 ACH	-130.1 CFM -0.25 ACH	-22.0 % -22.0 %

Cost Estimates

1. Estimated Costs of Air Leakage for Heating:				
2. Estimated Costs of Air Leakage for Cooling:	\$90	\$67	\$-23	-25.2 %

BUILDING LEAKAGE CURVE COMPARISON

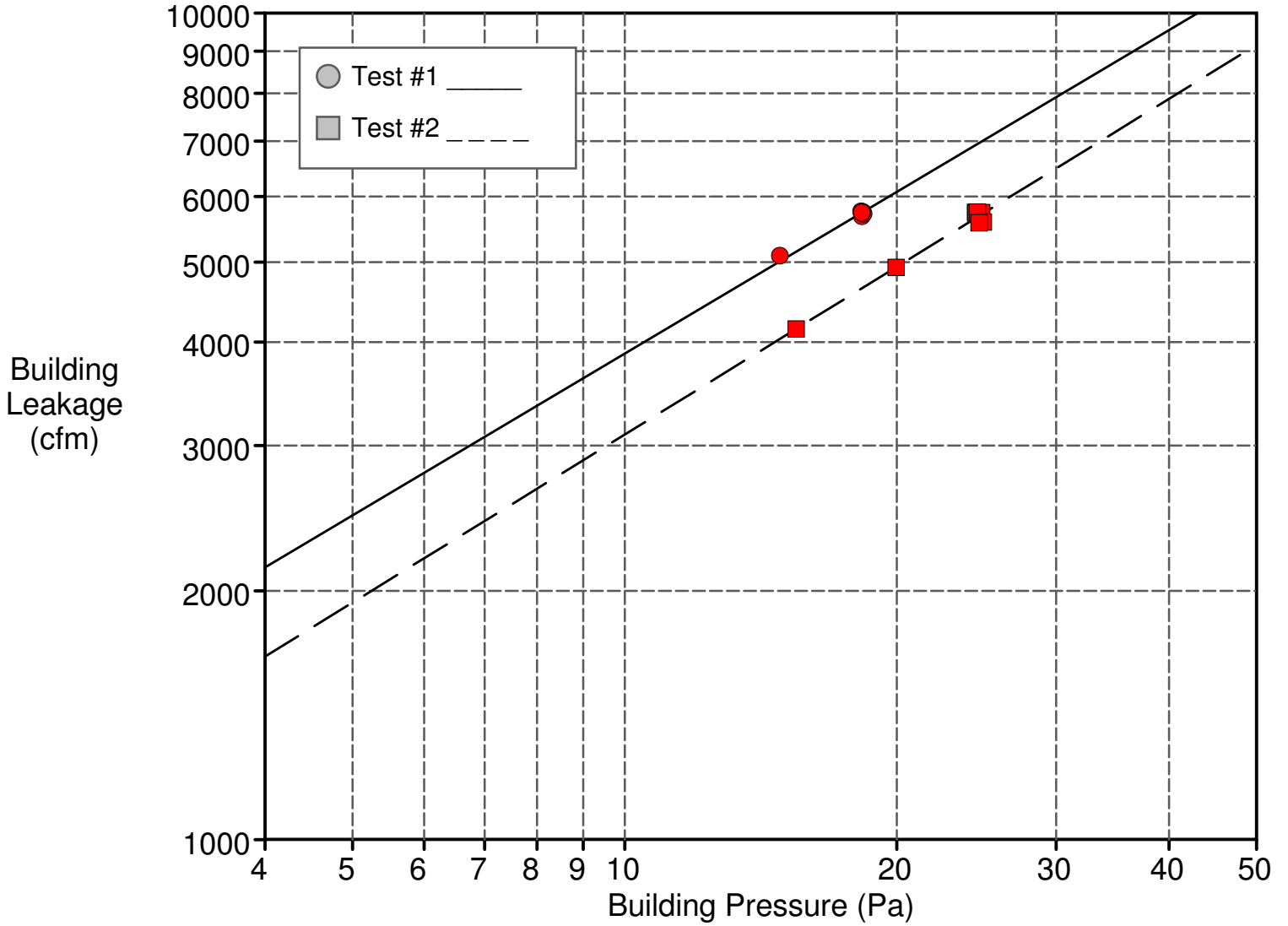
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Test #1

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Test #2

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Date of Test: 8/19/2010



AIR LEAKAGE TEST RESULTS

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Richmond, VA 23225
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Test Performed For: Capital Inner Window
5004 West Clay Street
Richmond, VA 23230
Phone 804-266-3967
Fax 804-266-0710

Test Results

1. Measured Leakage: **606 sq. in. (11031 CFM @ 50 Pa)**

This leakage area represents the cumulative size of all holes and cracks in the exterior of your house through which unconditioned outside air enters your home and conditioned air escapes.

2. Est. Annual Air Change Rate: **1.18 air changes/hour (123.8 CFM/person) ***

3. Est. Cost of Air Leakage **\$ 589 per year (heating and cooling) ***

Ventilation Guideline

ASHRAE Standard 62.2 recommends minimum ventilation requirements for residential buildings to maintain acceptable indoor air quality. Based on the results of this airtightness test, Standard 62.2 does not indicate the need for whole building mechanical ventilation. **

Additional Information

If some of the house leakage is located in the forced air duct system, both the leakage rate and energy costs will tend to be higher than reported above. Duct leaks result in much greater air leakage because they are subjected to much higher pressures than typical house leaks. Duct leaks can also seriously degrade indoor air quality.

Many factors contribute to indoor air quality including ventilation rates, sources and locations of pollutants, proper operation of combustion appliances and occupant behavior. Additional testing is needed to fully evaluate the air quality in your house.

* The estimated annual air change rate is based on ASHRAE Standard 136-93 and assumes no mechanical ventilation. Actual air change rates and costs may differ from these estimates by a factor of 2 or more.

** ASHRAE Standard 62.2 also contains requirements for local kitchen and bathroom mechanical exhaust systems. These local exhaust systems may be incorporated into a whole building ventilation strategy. Consult Standard 62.2 for more information on ventilation strategies and specific requirements and exceptions contained in the Standard.

AIR LEAKAGE TEST RESULTS

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Test Results

1. Measured Leakage: **472 sq. in. (9163 CFM @ 50 Pa)**

This leakage area represents the cumulative size of all holes and cracks in the exterior of your house through which unconditioned outside air enters your home and conditioned air escapes.

2. Est. Annual Air Change Rate: **0.92 air changes/hour (96.6 CFM/person) ***

3. Est. Cost of Air Leakage **\$ 482 per year (heating and cooling) ***

Ventilation Guideline

ASHRAE Standard 62.2 recommends minimum ventilation requirements for residential buildings to maintain acceptable indoor air quality. Based on the results of this airtightness test, Standard 62.2 does not indicate the need for whole building mechanical ventilation. **

Additional Information

If some of the house leakage is located in the forced air duct system, both the leakage rate and energy costs will tend to be higher than reported above. Duct leaks result in much greater air leakage because they are subjected to much higher pressures than typical house leaks. Duct leaks can also seriously degrade indoor air quality.

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Test Home

1002 West High Street, Petersburg, VA 23803 (312.22 SF)

Figure	Estimated U-Value of Current Windows	Upgraded with Climate Seal Inner Window (Max Value)	Difference (Savings)	Upgraded with Climate Seal Inner Window (Min Value)	Difference (Savings)
U-Value	0.89	0.45	0.44	0.42	0.47
Annual Loss in BTU's (figured using 3963 HDD)	26,429,323	13,363,140	13,066,183	12,472,265	13,957,058
Expected Savings in Home Heated by Heat Pump (7.5 HSPF @ .09 kwh)	\$308.47	\$155.97	\$152.50	\$145.57	\$162.90
Expected Savings in Home Heated by Natural Gas Furnace (85 AFUE @ 1.17 ccf)	\$363.79	\$183.94	\$179.85	\$171.68	\$192.11

1. U-Value inserted using default values provided by window chart.
2. Annual Loss in BTU's calculated using U-Value x 3963 x 24 x Window Surface Area.
3. Expected savings for Heat Pump calculated using BTU's / Efficiency / 3412 x Cost. Efficiency figured using HSPF/3.413 which equals COP. In this case 2.26.
4. Expected savings for Gas heat calculated using BTU's / Efficiency / 100000 x Cost. Efficiency figured using AFUE/100. In this case .85.