280115

Retrotec rCloud

Quality Assurance Report
Resnet 380-2016 Multi Point Blower Door Test

PASS	Your Result: 2.01 ACH50 (2117.78 CFM50 * 60 / 63099 ft³) Target < 5 ACH50

Test Information

Test Name	Collective 12606 BD
Test Date	2024-04-01 02:31 PM (PDT)
Export id	AY02FRCH
Company Name	Best Energy Rating
Technician Name	Michael Bestenlehner
Technician Email	mbest@bestenergyrating.com

Building Information

Address	12606 N 128th Pl
City	Scottsdale
State	AZ
Zip/postal Code	85259
Country	United States
Year Constructed	2024
Elevation	1759 ft
Address Verified?	Yes
Building Latitude, Longitude	33.600702, -111.804304
GPS validation	Tester location not verified
Estimated Distance From Address	Not available

Test Equipment

Fan Model	Retrotec 5000
Fan Serial Number	sfn103346
Pressure Gauge Model	Retrotec DM32X
Gauge Serial Number	500019

Environmental Conditions

Pre-test Indoor Temperature	65 °F
Pre-test Outdoor Temperature	57 °F
Wind Speed	2 MPH
Average Barometric Pressure	101.5 kPa

Test Dimensions

Conditioned Floor Area	4617 ft²
Volume	63099 ft³

Test Results Summary

Test Type	Resnet 380-2016 Multi Point Blower Door Test
Time Averaging	10 seconds
Air Changes Per Hour	2.014
Corrected Flow	2117.78 CFM @ 50 Pa
Correlation, *r*	0.998
Intercept	127.858
Slope, *n*	0.718

Test Results

Test Data Set 1

Flow Direction	Depressurize
Gauge Location	Inside
Test fan location	Garage door
Average baseline	-0.69 Pa

	Depressurize Results
Air changes at 50 Pa, n_{50}	2.0138 /hr
Air leakage rate at 50 Pa, q_{50}	2117.78 CFM
Effective leakage area at 4 Pa, $EfLA_4$	98 in²
Specific effective leakage area (floor) at 4 Pa, ELA_{F4}	0.0213 in²/ft²
Normalized leakage area at 4 Pa, NLA_4	0.0213

Baseline, initial (Pa)

-0.77	-0.72	-0.7	-0.69	-0.68	-0.67	-0.67	-0.67	-0.68	-0.7

Average baseline, initial	ΔP_{01}	-0.69	ΔP_{01-}	-0.7	ΔP_{01+} 0
Baseline Duration		10 seconds			

Building pressure (Pa)	-8.95	-19.8	-30.01
Induced pressure (Pa)	-8.25	-19.11	-29.32
Fan Pressure [5000 - B4] (Pa)	109.18		
Fan Pressure [5000 - B8] (Pa)		68.23	124.05
Fan Pressure [5000 - A] (Pa)			
Total flow q_r (CFM)	644.49	1107.64	1529.59
Measured flow q_m (CFM)	661.73	1137.27	1570.49
Total flow through envelope, q_{env} (CFM)	651.64	1119.94	1546.56
Error	-0.9%	-0.9%	2.4%

Building pressure (Pa)	-40.17	-49.69	-60.7
Induced pressure (Pa)	-39.47	-49	-60.01
Fan Pressure [5000 - B4] (Pa)			
Fan Pressure [5000 - B8] (Pa)			
Fan Pressure [5000 - A] (Pa)	42.46	53.89	67.91
Total flow q_r (CFM)	1884.12	2123.62	2385.14
Measured flow q_m (CFM)	1934.51	2180.42	2448.93
Total flow through envelope, q_{env} (CFM)	1905.02	2147.19	2411.61
Error	2.8%	-0.4%	-2.9%

Correlation, r	0.9980	Confidence Limit 95%	
Intercept, C_{env}	129.377	111.059	150.716
Intercept, C_L	127.858	109.755	148.947
Slope, n	0.718	0.674	0.762

Compliance Verification

3.2.1. Fenestration. Exterior doors and windows are closed and latched.	Confirmed
3.2.2. Attached garages. If blower door is installed between the house and the garage, in which case the garage shall be opened to outside by opening at least one exterior garage door.	Confirmed
3.2.3. Crawlspace vents and hatches	N/A
3.2.4. Attic doors and hatches	Open
3.2.5. Basement doors	N/A
3.2.6. Interior doors. All doors between rooms inside the Conditioned Space Volume are opened.	Confirmed
3.2.7. Chimney dampers and combustion-air inlets on solid fuel appliances are closed.	Confirmed
3.2.8. Combustion appliance flue gas vents are left in their as-found position.	Confirmed
3.2.9. Fans Turned Off - Any fan or appliance capable of inducing airflow across the building enclosure are turned off including, but not limited to, clothes dryers, attic fans, kitchen and bathroom exhaust fans, air handlers, ventilation fans used in a whole-house mechanical ventilation system (example a system intended to meet ASHRAE Standard 62.2), and crawlspace and attic ventilation fans. This requirement to turn fans off includes accessible fans in adjacent attached dwelling units.	Confirmed
3.2.10.1. Non-motorized dampers (example pressure-activated operable dampers and fixed dampers), that connect the Conditioned Space Volume to the exterior or to Unconditioned Space Volumes shall be left in their as-found positions. (example, a fixed damper in a duct supplying outdoor air for an intermittent ventilation system that utilizes the HVAC fan shall be left in its as-found position).	Confirmed
3.2.10.2. Motorized dampers that connect the conditioned space volume to the exterior or to unconditioned spaces shall be placed in their closed positions and shall not be further sealed.	Confirmed
3.2.11.1. Non-dampered ventilation openings of intermittently operating local exhaust ventilation systems (example bath fan and kitchen range fan), that connect the Conditioned Space Volume to the exterior or to Unconditioned Space Volume shall be left open.	Confirmed
3.2.11.2. Non-dampered ventilation openings of intermittently operating whole-house ventilation systems, including HVAC fan-integrated outdoor air inlets, that connect the Conditioned Space Volume to the exterior or to Unconditioned Space Volume shall not be sealed.	Confirmed
3.2.11.3. Non-dampered ventilation openings of continuously operating local exhaust ventilation systems, (example bathroom or kitchen exhaust), that connect the Conditioned Space Volume to the exterior or to Unconditioned Space Volume shall be sealed, preferably at the exterior of the enclosure.	Confirmed
3.2.11.4. Non-dampered ventilation openings of continuously operating whole-house ventilation systems that connect the Conditioned Space Volume to the exterior or to Unconditioned Space Volume shall be sealed at the exterior of the enclosure where conditions allow.	Confirmed
3.2.11.5. All other Non-dampered intentional openings between Conditioned Space Volume and the exterior or Unconditioned Space Volume shall be left open, (Informative Note: For example undampered combustion air or make-up air openings shall be left in their open position).	Confirmed
3.2.12. Whole-building fan louvers and shutters shall be closed. In addition, if there is a seasonal cover present, it shall be installed.	Confirmed
3.2.13. The opening to the exterior of evaporative coolers shall be placed in its off position. In addition, if there is a seasonal cover present, it shall be installed.	Confirmed
3.2.14. Operable window trickle-vents and through-the-wall vents shall be closed.	Confirmed
3.2.15. Supply registers and return grilles are left in their as-found position and left uncovered.	Confirmed
3.2.16. Plumbing drains with empty p-traps shall be sealed or filled with water.	Confirmed
3.2.17. Vented combustion appliances shall remain off or in "pilot only" mode for the duration of the test.	Confirmed

Test Notes

No notes entered.

Flow Equation Parameters - Factory Default

Fan Model	Retrotec 5000
Fan Serial Number	sfn103346
Flow Equation Parameters - B1	
Units Used For Flow Parameters in Equation	CFM

Fan pressure (FP) is the measured fan pressure when using a self-referenced fan or when the room pressure is negative. If using a fan which is not self-referenced, and the room pressure is positive, fan pressure is calculated by subtracting the measured room pressure from the absolute value of the fan pressure.
If PrA is greater than 0 or fan is self-referencing: FP = |PrB| - PrA
If PrA is less than 0 or fan is self-referencing: FP = PrB
Flow calculations are not valid if fan pressure is less than either MF or (K2 x |RP|)
FP = fan pressure, RP = room pressure

Range	N	K	K1	K2	K3	K4	MF
Open	0.4980	548.0000	0.0000	0.3000	0.0000	1	10
A	0.5020	287.0000	0.0000	0.4000	0.0000	1	20
B8	0.5400	113.2500	0.0000	0.7000	0.0000	1	40

flow = $(FP - RP \times K1)^n \times (K + K3 \times FP) \times K4$

Range	A	B	C	D	F	G	K2	MF
B4	0.0000079426	-0.00864000	4.9000	206.00	-0.19	29	0.8000	40
B2	0.0000008800	-0.00290000	2.1500	90.00	0.10	30	1.0000	50
B1	0.0000005000	-0.00128000	1.0200	54.00	0.00	30	1.0000	60
B74	0.0000007960	-0.00095010	0.5900	18.00	0.15	25	0.8000	35
B47	0.0000002690	-0.00035905	0.2435	12.05	0.09	25	1.0000	50
B29	0.0000001110	-0.00014900	0.0920	4.40	-0.02	25	0.6000	50

flow = $(A \times FP^3) + (B \times FP^2) + (C \times FP) + D + ((G - RP) \times F)$