City of Fort Collins Residential Air Tightness Testing Protocol,
New Buildings or Attached and Detached Single Family Dwellings

Approved Testers
Test results will only be accepted from individuals that hold any of the following certifications: RESNET Rater or RFI, BPI Building Analyst or BPI IDL, or other building performance professional approved by the Building Official.

Building or dwelling unit air leakage testing code reference
2024 International Energy Conservation Code (IECC) as amended by the City of Fort Collins. Section **R402.5.1.2 Air leakage testing**. Testing is required for all residential energy code compliance paths and for all residential buildings and dwelling units.

Testing protocol
- A multi-point air tightness test shall be conducted based on the ANSI/Residential Energy Services Network (ANSI/RESNET)/ICC 380, ASTM E779, ASTM E1827 or ASTM E3158.

Compliance requirement
The building or dwelling unit air change rate shall not exceed 3.0 ACH50 *or* 0.16 CFM per square foot (sq ft) of *dwelling unit enclosure area* when tested at a 50 Pascal (Pa) test pressure.

Submittal requirement
Output from the blower door testing / analysis software showing, at a minimum, the following information:
- Building address
- Date of test
- Test technician* and company conducting the test
- Building volume (cubic feet) and/or sq ft of dwelling unit enclosure area that encloses the building thermal envelope as defined within the IECC.
- Building leakage rate at 50 Pa test pressure (corrected CFM50)
- Percent uncertainty in the corrected CFM50, at the 95% confidence level (+/- 5%)
- Building air change rate at 50 Pa test pressure (ACH50 = CFM50 x 60/volume) *or* (CFM50 / sq ft dwelling unit enclosure area)

*The tester must be identified on the software report. This info may be handwritten on the report.

Note
One example of measurement software meeting the requirements above is TECTITE, published by 'The Energy Conservatory'. TEC software options are available at www.energyconservatory.com.

Attached garage isolation
Isolation testing of attached garages from adjoining conditioned areas shall be verified in accordance with the following:

Testing protocol

- Set up the building in accordance with the testing protocol for building or dwelling unit air leakage above.
- Garage doors to the exterior shall be closed.
- Place a pressure tap in the garage and close the door between house and garage, without crimping the sensing tube (recommendation: use rigid metal tube where it passes through doorway).
- Adjust the blower door fan speed such that the building interior is depressurized to -50 Pa with respect to (WRT) the outdoors.
- Measure the house pressure (Pa) WRT the garage.

NOTE: Where tested pressure falls below -45 Pa the tester may proceed with "Open a Door" test below.

Testing Protocol – Open a Door

- Follow the above "Testing Protocol" again and note the Pa WRT garage.
- Using the tables below, locate and note the "multiplier" that corresponds to the Pa WRT garage from above. *Ex: if the house Pa WRT garage is 36 the multiplier will be 0.96.*
- Note the house CFM50 with door from house to garage closed.
- Open the door from house to garage and return the building to -50 Pa WRT outdoors making note of the house CFM50 with door from house to garage open.
- Subtract the CFM50 with door from house to garage closed from the CFM50 with door to garage open.
- Multiply the difference between the two CFM50 numbers by the "multiplier" from step two.
- If the result is less than or equal to 100 CFM the house WRT garage passes.

Pa WRT garage (step 1 above)	Multiplier	Pa WRT garage (step 1 above)	Multiplier	Pa WRT garage (step 1 above)	Multiplier
44	0.37	34	1.17	24	3.04
43	0.43	33	1.29	23	3.36
42	0.49	32	1.42	22	3.73
41	0.56	31	1.56	21	4.14
40	0.63	30	1.71	20	4.61
39	0.70	29	1.88	19	5.15
38	0.78	28	2.07	18	5.77
37	0.87	27	2.27	17	6.50
36	0.96	26	2.50	16	7.36
35	1.06	25	2.76	15	8.38

Compliance and submittal requirement

The house pressure with respect to the garage shall be in the range of -45 to -50 Pa, or the Open a Door test shall be less than or equal to 100 CFM. Record the test result on the report using "House pressure WRT garage = _X_Pa". 'X' being the pressure measurement. Or record the Open a Door test result using "Open a Door = _X_CFM". 'X' being the CFM measurement. This may be recorded within the *'Comments'* section of TECTITE. *Example below.*

Rooms containing fuel-burning appliances isolation

Where open combustion air ducts provide combustion air to open combustion fuel-burning appliances, the appliances and combustion air opening shall be located outside the building thermal

envelope or enclosed in a room that is isolated from inside the thermal envelope.

Testing protocol

- Set up the building in accordance with the protocol for whole-house air leakage, above.
- Place a pressure tap in the mechanical room and close the door between house and mechanical room, without crimping the sensing tube (recommendation: use rigid metal tube where it passes through doorway).
- Adjust the blower door fan speed to so that the building interior is depressurized to -50 Pascals with respect to the outdoors.
- Measure the house pressure with respect to the mechanical room.

Compliance and submittal requirement

The house pressure with respect to the mechanical room shall be in the range of -45 to -50Pa. Record the test result on the report using “House pressure WRT mechanical room = _X_Pa”. ‘X’ being the pressure measurement. This may be recorded within the *‘Comments’* section of TECTITE. *Example below.* Natural draft appliances must also pass a Combustion Safety Test.

Example:

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Date of Test: 4/17/2022 Test File: Untitled

Comments

House pressure WRT garage = -46.7 Pa, or Open a Door = 94 CFM

House pressure WRT mechanical room = -48.1 Pa