ASHRAE 62.2-2016

Using the New Standard in the Field

Rick Karg

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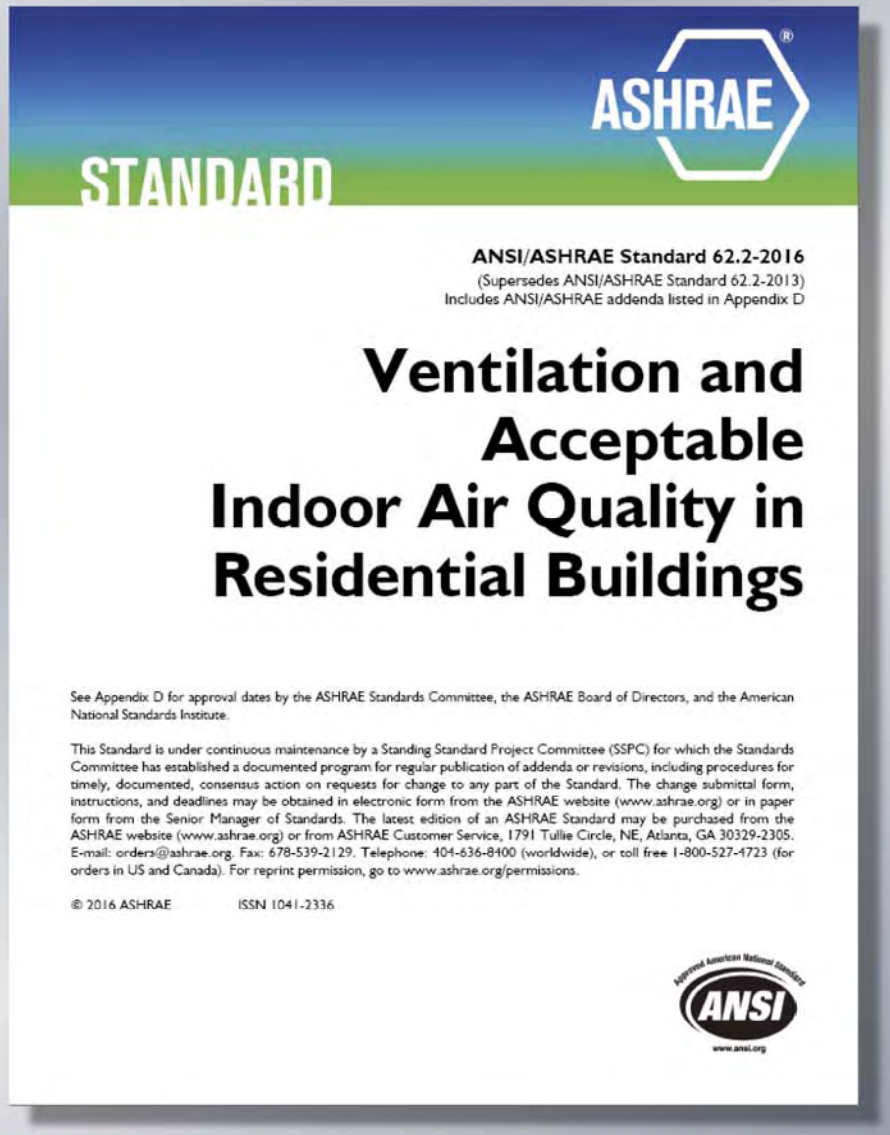
rjkarg@residentialenergydynamics.com

Topics Addressed

- Significant changes to 62.2-2016.
- Local ventilation.
- Dwelling-unit ventilation.
  - Infiltration credit
  - Alternative compliance path
- Selected additional provisions.
- Example using RED tool.

RED

AHSRAE 62.2-2016



STANDARD

ASHRAE

ANSI/ASHRAE Standard 62.2-2016
(Supersedes ANSI/ASHRAE Standard 62.2-2013)
Includes ANSI/ASHRAE addenda listed in Appendix D

Ventilation and Acceptable Indoor Air Quality in Residential Buildings

See Appendix D for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

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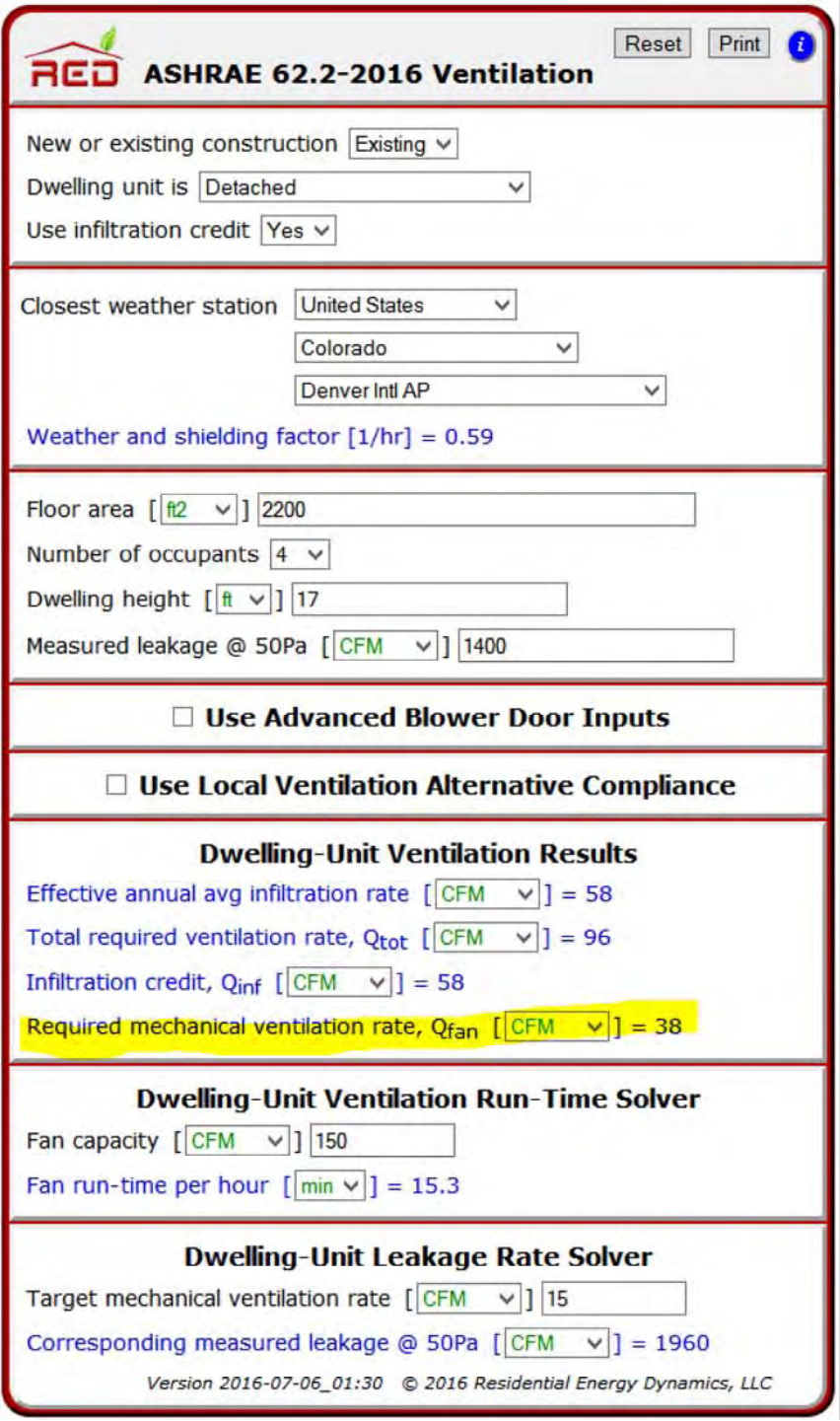

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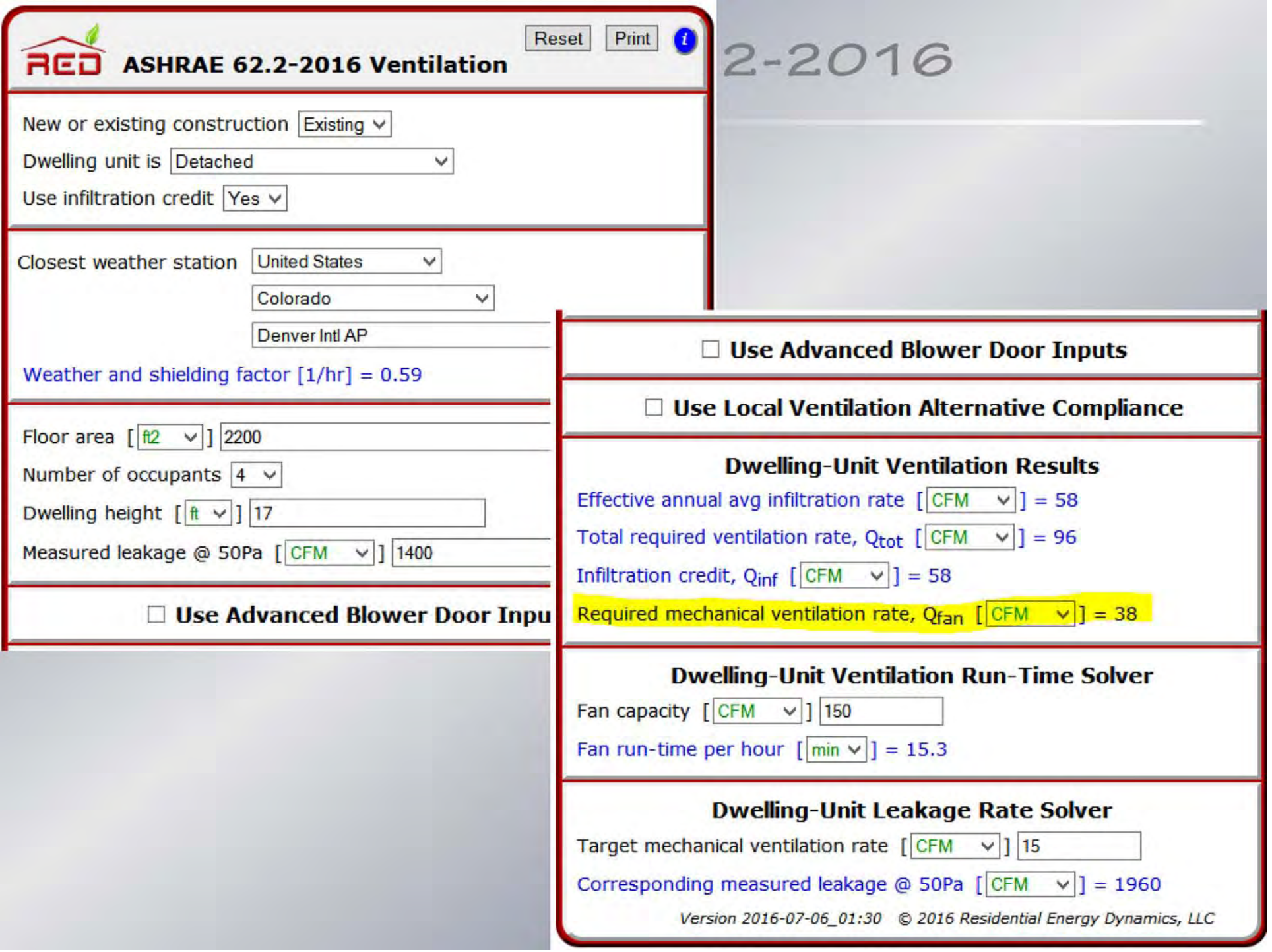
Free web application

ResidentialEnergyDynamics.com

REDcalc.com


Reset
Print
ASHRAE 62.2-2016 Ventilation
2-2016
New or existing construction Existing
Dwelling unit is Detached
Use infiltration credit Yes
Closest weather station United States
Colorado
Denver Intl AP
Weather and shielding factor [1/hr] = 0.59
Floor area [ft2] 2200
Number of occupants 4
Dwelling height [ft] 17
Measured leakage @ 50Pa [CFM] 1400
Use Advanced Blower Door Inpu
Use Advanced Blower Door Inputs
Use Local Ventilation Alternative Compliance
Dwelling-Unit Ventilation Results
Effective annual avg infiltration rate [CFM] = 58
Total required ventilation rate, Qtot [CFM] = 96
Infiltration credit, Qinf [CFM] = 58
Required mechanical ventilation rate, Qfan [CFM] = 38
Dwelling-Unit Ventilation Run-Time Solver
Fan capacity [CFM] 150
Fan run-time per hour [min] = 15.3
Dwelling-Unit Leakage Rate Solver
Target mechanical ventilation rate [CFM] 15
Corresponding measured leakage @ 50Pa [CFM] = 1960
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Significant Changes to 62.2-2016

(not all changes discussed here)

Scope Expansion

- Standard now applies to all residential buildings, regardless of height.

Horizontally-Attached Units

- In 2013 version, no infiltration credit for dwelling units in multifamily (MF) buildings.
- In 2016, partial infiltration credit allowed for horizontally-attached (not stacked) dwelling units in MF buildings.

Multifamily Infiltration Credit

- How it is calculated:
  - Do a blower door test of the unit.
  - Calculate the fraction of enclosure area (6-sides) that is NOT attached to other units or garages.
  - Multiply infiltration estimate from blower door test by this fraction.

$$Q_{fan} = Q_{tot} - (Q_{inf} * A_{ext})$$

$$A_{ext} = \frac{\text{exterior surface}}{\text{total envelope surface}}$$

Local Kitchen Ventilation

- Kitchens now classified as "enclosed" or "nonenclosed".
  - Enclosed kitchen defined as having permanent openings to adjacent interior spaces not exceeding a total of 60 ft^2.

De Minimis for Existing Dwellings

- If minimum dwelling-unit ventilation is 15 CFM (7 L/s) or less, no dwelling-unit ventilation is required to be installed.

Local Ventilation

Local Ventilation

- Exhaust the worst air in the dwelling as quickly as possible.
  - Bathrooms
  - Kitchens

Bathrooms

- Demand-controlled
  - 50 CFM (25 L/s)
- Continuously operating
  - 20 CFM (10 L/s)

Kitchens

- Demand-controlled
  - Enclosed
    - Range hood -100 CFM (50 L/s)
    - Other fan - 300 CFM (150 L/s) or 5 ACH
  - Nonenclosed
    - Range hood - 100 CFM (50 L/s)
    - Other fan - 300 CFM (150 L/s)

Kitchens

- Continuously operating
  - Enclosed
    - 5 ACH
  - Nonenclosed
    - Not allowed

Dwelling-Unit Ventilation

Exhaust, Supply, or Balanced

Dwelling-Unit Ventilation

- Assumes two occupants in master bedroom and one in the other bedrooms. Over this density, increase ventilation by 7.5 CFM/person.
- Ventilation air must come directly from the outdoors.
- Infiltration credit is allowed for envelope air leakage.

ASHRAE 62.2-2016

$$Q_{tot} = 0.03A_{floor} + 7.5(N_{bedroom} + 1)$$

Basic dwelling-unit ventilation equation

Dwelling-Unit Ventilation

- The dwelling-unit ventilation requirements may be satisfied by intermittent operation.
- Example:
  - HRV rated at 150 CFM capacity.
  - Whole house requirement is 50 CFM.
  - Operate HRV on a timer for 20 minutes out of every hour to get 50 CFM average.

Infiltration Credit for Existing and New Dwellings

Dwelling-Unit Ventilation
Existing Dwellings

$$Q_{tot} = 0.03A_{floor} + 7.5(N_{bedroom} + 1)$$

Total Required Ventilation Rate, Q_{tot}
+ Alternative Compliance Supplement
- Infiltration Credit, Q_{inf}
Required Mechanical Ventilation Rate, Q_{fan}

☐ **Use Advanced Blower Door Inputs**

☑ **Use Local Ventilation Alternative Compliance**

Kitchen included ☑ # Baths included 2

	Fan Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	65	☑	15
Bath #1	25	☑	5
Bath #2	30	☐	20

Total deficit [CFM] = 40

Dwelling-Unit Ventilation Results

Effective annual avg infiltration rate [CFM] = 58

Total required ventilation rate, Q_{tot} [CFM] = 96

Alternative compliance supplement [CFM] = 10

Infiltration credit, Q_{inf} [CFM] = 58

Required mechanical ventilation rate, Q_{fan} [CFM] = 48

Alternative Compliance Path for Existing Dwellings

Alternative Compliance Path

- For existing dwellings only.
- Provides alternative method of meeting local exhaust requirements in kitchens and bathrooms that do not have the existing LOCAL fan flow required by ASHRAE 62.2-2010/2013/2016.
- Always use on POST-RETROFIT fan flow rates.

Existing Dwellings ONLY

Alternative Compliance Path

- In each room where local ventilation should be, determine deficit relative to required demand-controlled rate:
  - How much less than 50 CFM in bathrooms.
  - How much less than 100 CFM in kitchens.
- For each room with a deficit, reduce room's deficit by 20 CFM if that room has an openable window.*

*Deficit may not be less than zero for any bathroom or kitchen.

Existing Dwellings ONLY

RED

Alternative Compliance Path

- Add up deficits and divide by 4.
- Add this result to the dwelling-unit ventilation requirement.
  - This becomes the new dwelling-unit ventilation requirement.

Existing Dwellings ONLY

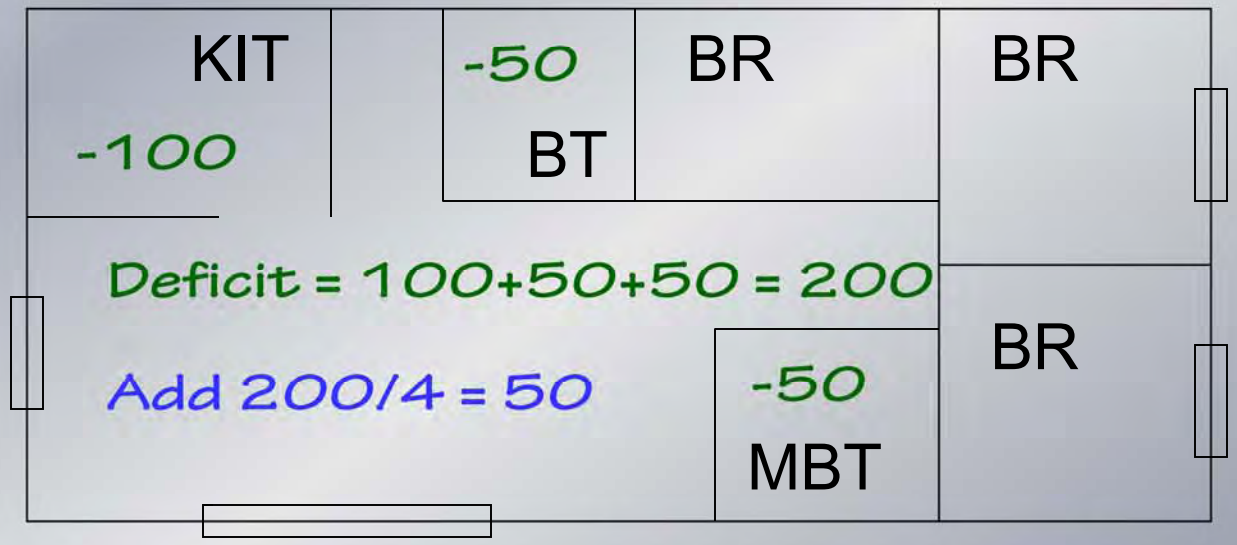
Alternative Compliance Path

- For existing fans remaining in place, sound and ducting requirements of 62.2 are not applicable, but must terminate outdoors.

Existing Dwellings ONLY

Alternative Compliance Path

Example #1: 3 Bedroom



No Windows in KITCHEN or BATHS

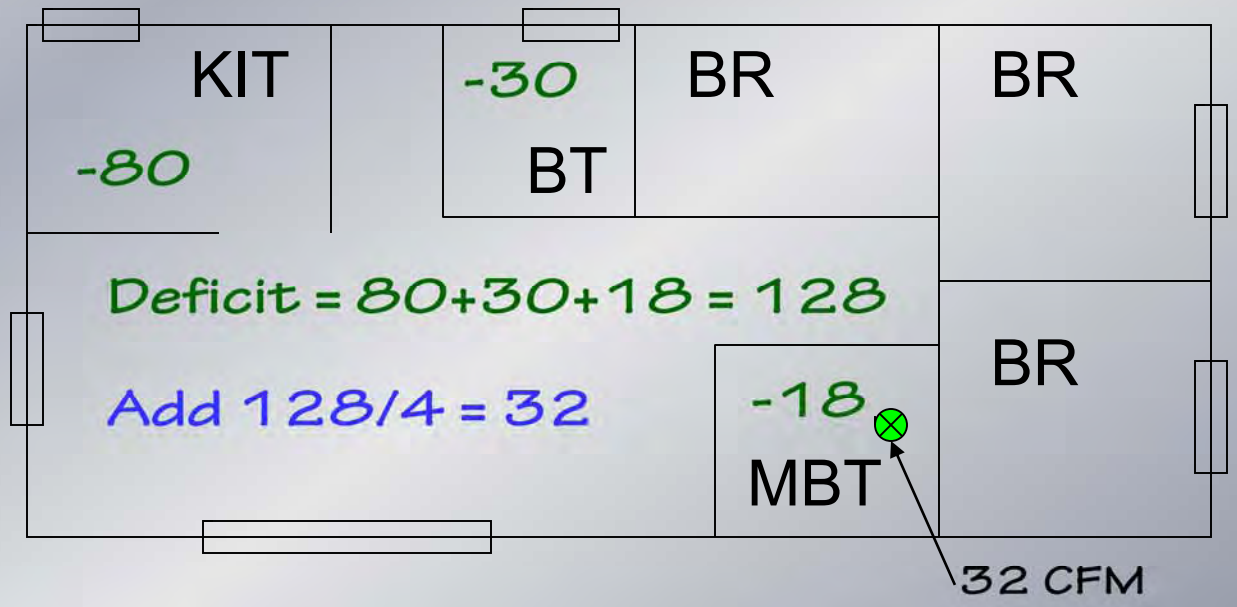
Dwelling-unit requirement = 45 + 50 = 95 CFM

Source: P. Francisco

Existing Dwellings ONLY

Alternative Compliance Path

Example #2: 3 Bedroom



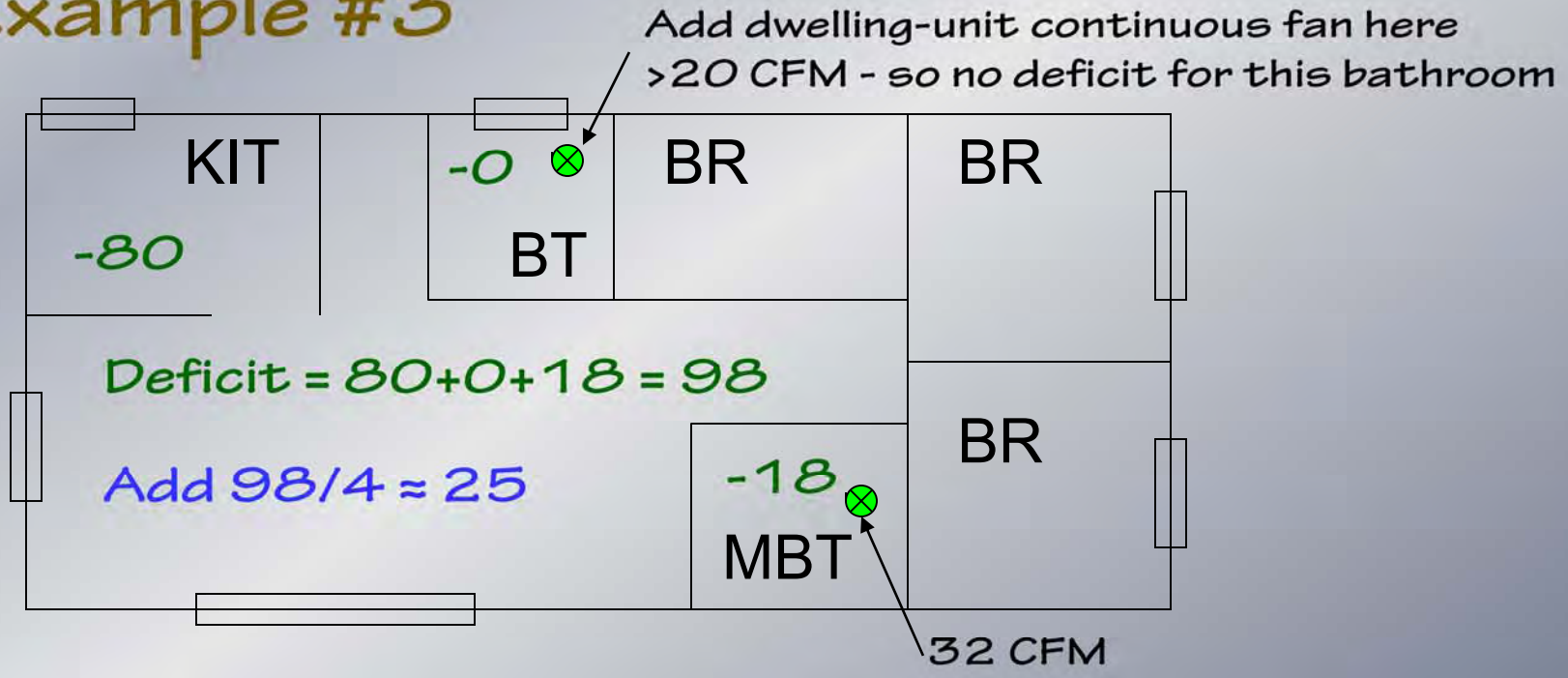
Dwelling-unit requirement = 45 + 32 = 77 CFM

Source: P. Francisco

Existing Dwellings ONLY

Alternative Compliance Path

Example #3



Dwelling-unit requirement = 45 + 25 = 70 CFM

Source: P. Francisco

Existing Dwellings ONLY

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Selected Additional 62.2-2016 Provisions

Attached Garages

- Must prevent migration of contaminates to the adjoining occupiable space.
  - All joints, seams, penetrations, and openings must be sealed or gasketed.
- Any ducts in the garage must leak less than 6% of total heating/cooling system air flow.
  - For example, 90 CFM of leakage for a 1500 CFM system.

Labeling

- Controls for dwelling-unit ventilation shall be labeled as to their function.

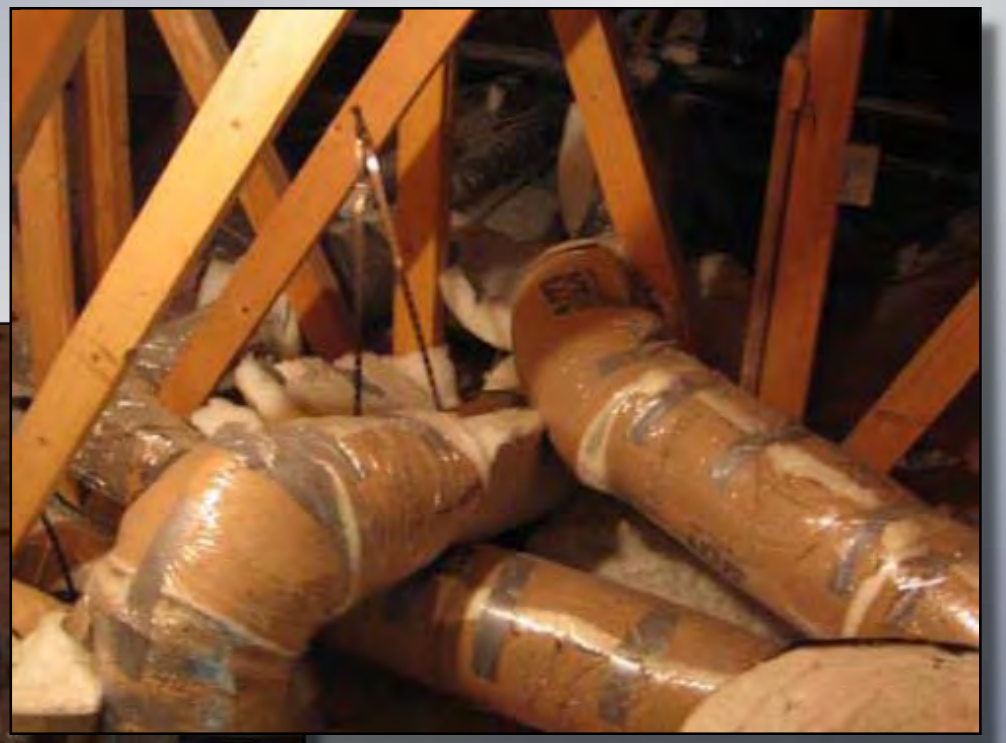
Sound Ratings for Fans

- 1 sone maximum for continuously operating fans and double-duty fans.
- 3 sone maximum occupant-controlled fans.
- Already-installed fans in existing homes are exempt.

Ventilation Ducting

- If outside thermal envelope, insulate.
- Rigid ductwork preferred, but flexible OK.
- Use Table 5.3 in 62.2 Standard.
- Support properly.

Not good!



Carbon Monoxide Alarm

- Carbon monoxide alarm required in all homes, regardless appliance types.

Resources

- Residential Energy Dynamics free online tools - www.REDcalc.com
- Free viewing version of 62.2 standard available online.
- 62.2-2016 Standard, ASHRAE.
- *62.2-2016 User's Manual*, ASHRAE.
- *Residential Ventilation Handbook*, Paul Raymer, 2010.
- Guideline 24-2015, ASHRAE.

ANNUAL VENTILATION COST CALCULATOR

Interested in knowing how much it might cost you to operate an AirCycler® ventilation system? Complete the fields below for an estimated range of your annual energy cost. The range covers homes that are old and leaky (needing very little ventilation) to homes that are new and airtight (needing more ventilation).

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Ventilation System	SmartExhaust
Exhaust Fan	Custom fan specifications
Exhaust Fan CFM	110 CFM
Exhaust Fan Watts	20 watts
ZIP Code	23456
Floor Area	2300 ft²
Bedrooms	3
Stories	2
Heating Fuel	Natural gas
Heating Fuel Price	$ 1.57 per therm
Electricity Price	¢ 11.5 per kWh

Annual Ventilation Cost Range

Low-end Estimate $18

- Older home
- Leaky (8 ACH_{50})
- 15 CFM ventilation required

High-end Estimate $78

- Newer home
- Built to IECC-2012 or IECC-2015
- Air tight (3 ACH_{50})
- 68 CFM ventilation required

62.2-2016

AirCycler App

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Ventilation System	SmartExhaust
Exhaust Fan	
Exhaust Fan CFM	
Exhaust Fan Watts	
ZIP Code	23456

SmartExhaust
g1 (FRV) Supply-only
g2 + FanConnect
g2 + FanConnect Balanced
Average HRV with Furnace
Average ERV with Furnace
Average Stand-alone HRV
Average Stand-alone ERV

Includes fan electricity and cooling and heating fuel lost

- Override fan CFM and watts
- Override air handler blower watts and damper flow
- Override fuel and electric costs
- ZIP code keyed to TMY3 data

RED

Panasonic VENTILATION
Annual Ventilation Cost Estimator

Estimate the total cost to operate your Panasonic ventilation system versus other solutions. Simply complete the fields below for an estimated range of your annual energy cost. The range covers homes that are old and leaky (needing very little ventilation) to homes that are new and tight (needing more ventilation).

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System type	Average stand-alone HRV
ZIP code	33767
Floor area	2200 ft²
Number of bedrooms	3
Number of stories	2
Heating fuel type	Natural gas
Heating fuel price	$ 2.03 per therm
Electricity price	¢ 11.3 per kWh

Annual Ventilation Cost Range

High-end estimate $130
- Newer home
- Built to IECC-2012 or IECC-2015
- Air tight (5 ACH_{50})
- 52 CFM ventilation required

Low-end estimate $38
- Older home
- Leaky (9 ACH_{50})
- 15 CFM ventilation required

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Panasonic App

Includes fan electricity and cooling and heating fuel lost

- Override fan CFM and watts
- Override air handler blower watts and damper flow
- Override fuel and electric costs
- ZIP code keyed to TMY3 data

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System type: Average stand-alone HRV

ZIP code

Floor area

Number of bedrooms

Number of stories: 2

- SelectCycler Hybrid
- SelectCycler Balanced
- Exhaust- or supply-only fan
- Generic supply-only w/ furnace
- Average HRV w/ furnace
- Average ERV w/ furnace
- Average stand-alone HRV
- Average stand-alone ERV

Example with RED ASHRAE 62.2-2016 tool