MRC 2015 – CHAPTER 11, 15, 16, 19
1 CREDIT TECHNICAL (MECHANICAL, BUILDING INSPECTOR)

Based on ASHRAE Standard 62.2-2013

ASHRAE 62.2-2013 VENTILATION & ACCEPTABLE INDOOR AIR QUALITY IN LOW-RISE BUILDINGS

A Blower Door test tells you how tight or leaky a home or building is.

You can not rely on a leaky house to provide adequate ventilation.

ASHRAE 62.2-2013

Spot Ventilation is used in kitchens and bathrooms.

Dilution is Whole house ventilation.

ASHRAE 62.2-2013 QUIZ QUESTION ONE

ASHRAE Standard 62.2-2013 addresses Ventilation and acceptable Indoor Air Quality in Low-Rise Residential Buildings?

A. True

B. False

ASHRAE 62.2-2013

Air flow measurement at the kitchen exhaust hood should be 100 CFM (Cubic Feet per Minute) Tested or 5 ACH (Air Changes per Hour) continuous. Not required in ½ bathrooms.

Note: 2015 MMC Table 403.3.2.3 Minimum required local exhaust rates for Group R-2, R-3 and R-4 Occupancies: Kitchens 100 CFM intermittent or 25 CFM continuous.

Measure at the kitchen exhaust hood with a manometer, hose with an Energy Conservatory Exhaust Fan Flow Meter (Air is pulled through this device) or an Alnor LoFlo Balometer to measure supply air flow.

ASHRAE 62.2-2013

Note any operable windows that can be opened in the kitchen and bathrooms.

The bathroom(s) exhaust fan(s) should measure 50cfm (Cubic Feet per Minute) on demand or 20 CFM continuous each.

Note: Only one deficient reduction per room. The deficit cannot drop below zero.

ASHRAE 62.2-2013 QUIZ QUESTION TWO

The purpose of a Blower Door test is to determine:

A. The square feet of a house.
B. How many cubic feet the house is.
C. How tight or leaky the house is.
D. None of the above.

ASHRAE 62.2-2013 CALCULATION

1. Calculate how much ventilation the house needs by the size and occupancy.
2. How much more ventilation air does the house need by underperforming exhaust fans.
3. Calculate how much less ventilation there is, when the leakiness of the house is factored in.

ASHRAE 62.2-2013 CALCULATION

Step 1: Calculate the Whole Building Ventilation required.

(# of bedrooms + 1) x 7.5 + (0.03 x Conditioned floor area) = Whole Building Ventilation CFM (Cubic Feet per Minute)

(____ + 1) x 7.5 + (0.03 x _____) = _____ CFM

ASHRAE 62.2-2013 QUIZ QUESTION THREE

Spot Ventilation is used in kitchens and bathrooms:

A. True
B. False

ASHRAE 62.2-2013 CALCULATION

Step 2A: Calculate Kitchen Exhaust Deficit

Kitchen required CFM – Operable window – Tested Flow CFM (Cubic Feet per Minute) = Kitchen Deficit CFM (Cubic Feet per Minute)

100 - _____ - _____ = _____ CFM

ASHRAE 62.2-2013 CALCULATION

Step 2B: Calculate Bathroom(s) Exhaust Deficit(s)

Bathroom 1 Required CFM (Cubic Feet per Minute) – Operable Window – Tested Air Flow CFM (Cubic Feet per Minute) = Bathroom 1 Deficit CFM (Cubic Feet Per Minute)

50 - _____ - _____ CFM = Bathroom 1 _____ CFM Deficit

Bathroom 2 Required CFM – Operable Window – Tested Airflow = Bathroom 2 Deficit CFM

50 - _____ - _____ CFM = Bathroom 2 _____ CFM Deficit

ASHRAE 62.2-2013 QUIZ QUESTION FOUR

Air flow measurement at the kitchen exhaust hood should be 50 CFM tested or 2 Air Changes per hour.

A. True

B. False

ASHRAE 62.2-2013 CALCULATION EXAMPLE

A 1500 Square foot house with 3 bedrooms.

Step 1: Calculate the Whole Building Ventilation required.

(# of Bedrooms + 1) x 7.5 + (0.03 x Conditioned Floor Area) = Whole Building Ventilation

(3 +1) x 7.5 + (0.03 x 1500) = 75 CFM Required Ventilation

ASHRAE 62.2-2013 CALCULATION EXAMPLE

Step 2A: Kitchen required CFM – Operable Window – Tested Flow CFM = Kitchen Deficit CFM

100 – 20 -150 = -70 (Note: Negative numbers always become a Zero for this formula).

Step 2B: Bathroom required CFM – Operable Window – Tested Airflow CFM = Bathroom Deficit CFM

50 – 0 – 34 CFM = 16 CFM Bathroom Deficit

ASHRAE 62.2-2013 QUIZ QUESTION FIVE

The bathroom(s) exhaust fan(s) should measure 50 CFM on demand or 20 CFM continuous each:

A. True

B. False

ASHRAE 62.2-2013 CALCULATION EXAMPLE

- **Step 2C:** Use information from **Step 2A and 2B** to calculate Local Exhaust CFM Deficit.

- **Step 2A:** 100 – 20 – 150 CFM = 0 CFM Kitchen Deficit.
- **Step 2B:** 50 – 0 – 34 = 16 CFM Bathroom Deficit.
- **Step 2C:** Kitchen CFM Deficit + Bathroom CFM Deficit(s) = The sum of local exhaust Deficit CFM
- 0 + 16 CFM = 16 CFM divided by 4 = 4 CFM Local Exhaust Deficit CFM

ASHRAE 62.2 – 2013 CALCULATION EXAMPLE

Step 3: Use the answer from Step 1

(# of Bedrooms + 1) x 7.5 + (0.03 x Conditioned Floor Area) = Whole Building Ventilation

(3 + 1) x 7.5 + (0.03 x 1500) = 75 CFM Whole Building Ventilation

Step 3A: Measured Blower Door Test reading x 0.052 x # of stories in the House x Weather Shielding Factor (WSF) = Infiltration Credit

1800 CFM x 0.052 x 1 x .47 (Washington, DC) = 44 CFM Infiltration Credit

ASHRAE 62.2-2013 QUIZ QUESTION SIX

ASHRAE 62.2-2013 calculations includes:

A. Whole house Ventilation.
B. Kitchen Exhaust Deficit.
C. Bathroom(s) Exhaust Deficits(s).
D. All of the above.

ASHRAE 62.2 – 2013 CALCULATION EXAMPLE

Step 4:

Use the information from **Step 1:** Whole House Ventilation = 75 CFM

Use the information from **Step 2C:** Local Exhaust Deficit = 4 CFM

Use the information from **Step 3A:** Infiltration Credit = 44CFM

75 CFM + 4 CFM – 44 CFM = 35 CFM Whole House Ventilation that needs to be added.

ASHRAE 62.2 – 2013
Mechanical Ventilation Options

Exhaust only: Use multiple spot Ventilation fans like Kitchen or Bathroom(s) exhaust fans.

ASHRAE 62.2-2013 QUIZ QUESTION SEVEN

ASHRAE 62.2-2013 Calculation requires you to know the cubic feet of the house:

A. True

B. False

ASHRAE 62.2 – 2013
Mechanical Ventilation Options

Supply only: Ducted into the return side of an HVAC system like a gas furnace.

ASHRAE 62.2 – 2013
Mechanical Ventilation Options

- **Balanced:** Energy Recovery Ventilator (ERV)
- Energy Recovery Ventilators contain a core that can transfer both heat and humidity.
- During the heating mode, air temperatures inside the building are warmer than outside temperature, so the heat from the outgoing air is transferred to the colder incoming air.
- During the cooling mode the outdoor incoming air is warmer and can be more humid than the outgoing air. The heat exchange core is specially designed to capture and transfer maximum heat for maximum efficiency.

ASHRAE 62.2-2013 QUIZ QUESTION EIGHT

A house gets a 20 CFM credit if it has an Operable window in the kitchen or bathroom.

A. True

B. False

ASHRAE 62.2 – 2013
Mechanical Ventilation Options

Balanced: Heat Recovery Ventilator. (HRV)

HRV's simply exhaust stale air from inside the building and replace it with fresh air from outside and transfer heat between the incoming air and the outgoing air through a heat exchange core in the ventilator.

ASHRAE 62.2 – 2013
ERV vs. HRV

ERV’s differ from HRV’s in one main way.

ERV’s contain a core that can also handle moisture.

In hot humid climates, ERV’s are normally used.

In climates that get warm, but not humid, HRV’s are normally used.

Refer to the Manufacturers Product Data charts to determine which product is best for your climate.

ASHRAE 62.2-2013 QUIZ QUESTION NINE

ASHRAE 62.2-2013 allows for Ventilation options:

A. Exhaust fans in the kitchen.

B. Exhaust fans in the bathroom(s).

C. Supply air ducted into the return air duct.

D. All of the above.

ASHRAE 62.2-2013 QUIZ QUESTION TEN

Balanced Ventilation includes:

A. Heat recovery Ventilation (HRV).
B. Energy Recovery Ventilation (ERV)
C. Both A and B.
D. None of the above.

Thank You

Note: Some Manufacturers have charts that can be used on their products for sizing.

Resources:

ASHRAE

BUILDING PERFORMANCE INSTITUTE (BPI)

BUILDING SCIENCE TECH

BRYANT HEALTHY AIR SOLUTIONS

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