THE BEST WAY TO MEET ASHRAE 62.2 IN MULTIFAMILY BUILDINGS

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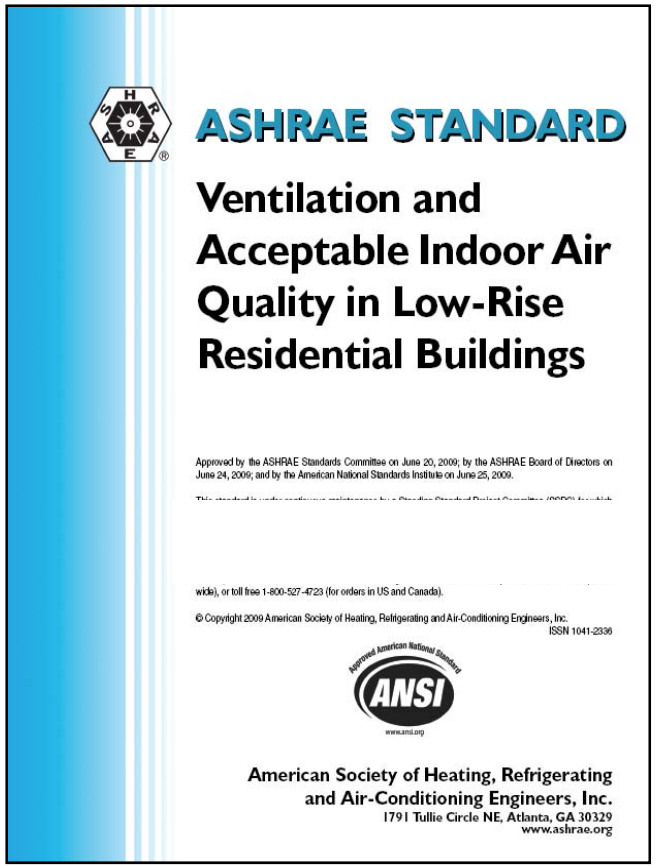
Building America Meeting 2013

ASHRAE 62.2 - 2013

- Replaced previous 62-89 to be specifically for low-rise (under four story) residential
- Under continuous revision
- Current version is 2013
- Has new section 8 for multi-family
  - A building = a unit
  - Applies to all units



Local Exhaust

- Local exhaust fans must be installed in bathrooms and kitchens
  - Must exhaust to outside
  - Bathrooms
    - 50 CFM on-demand, or
    - 20 CFM continuous.
  - Kitchen
    - 100 CFM on-demand, or
    - 5 ACH continuous, based on kitchen volume.

Exception for existing units

- Increase whole unit ventilation if lacking kitchen and bathroom exhausts
  - Missing exhausts are a “deficit”
  - Add one quarter of deficit to whole unit requirement
- In-place fans count against deficit if measured or rated and meeting duct sizing requirements
- Open windows count against deficit – 20 cfm per room
  - Example – no kitchen range hood, kitchen has openable window
    - Deficit = 0.25 (100-20) = 20 cfm

Air Inlet Location

- 10 ft from exhaust
  - Exceptions:
    - 3 ft from dryer vent or stretched string distance to roof vent
    - Windows and kitchen exhaust
    - Vent terminations compliant with NFPA 54 (furnaces and water heaters)
- Not easy with limited exterior wall space in MF?

Ventilation Open Area

- Habitable Spaces: 4% of floor area or 5 sq.ft.
- Toilets/utility rooms: 4% or 1.5 sq.ft.
- Not easy unless on exterior wall?
- Exceptions:
  - Toilet compartments
  - Utility rooms with a dryer vent

Whole Building - 2013

- Can be exhaust, supply or balanced
- Fan flow = 3cfm/100 sq.ft. + 7.5 cfm(N+1)
  - About double previous rate! (but "better" table)

Floor Area (ft^2)	Bedrooms				
	1	2	3	4	>5
<500	30	40	45	55	60
500-1000	45	55	60	70	75
1001-1500	60	70	75	85	90
1501-2000	75	85	90	100	105
2001-2500	90	100	105	115	120
2501-3000	105	115	120	130	135
3001-3500	120	130	135	145	150
>3501	135	145	150	160	165

Whole Building - 2013

- NO INFILTRATION CREDIT
- Common areas 6 cfm/100 sq.ft.
- Garages 40 cfm/100 sq.ft.
- Must minimize transfer air
  - All doors between dwelling units and common hallways gasketed – so no hallway supply?
  - <20 cfm/100 sq.ft. of envelope area (all six sides) at 50 Pa
- Common exhausts must have a backdraft damper

62-89 vs. 62.2 2010 vs. 62.2 2013

- Example 1. 500 sq.ft. 1 bedroom
  - 62.2 2013: 30 cfm (0.45 ACH)
  - 62.2 2010: 20 cfm (0.3 ACH)
  - 62-89 : 0.35 ACH (23 cfm)

- Example 2. 750 sq.ft. 2 bedroom
  - 62.2 2013: 45 cfm (0.45 ACH)
  - 62.2 2010: 30 cfm (0.3 ACH)
  - 62-89 : 0.35 ACH (35 cfm)

62-89 vs. 62.2 2010 vs. 62.2 2013

- Example 3. 1500 sq.ft. 3 bedroom townhome
  - 62.2 2013: 75 cfm (0.38 ACH)
  - 62.2 2010: 45 cfm (0.23 ACH) – same size single family
  - 62-89 : 0.35 ACH (70 cfm)

- Example 4. 2000 sq.ft. 3 bedroom condo
  - 62.2 2013: 90 cfm (0.34 ACH)
  - 62.2 2010: 50 cfm (0.19 ACH)
  - 62-89 : 0.35 ACH (93 cfm)

Combustion Appliance Issues

- 500 sq.ft. apt meeting transfer air requirement
  - Q50 = 350 cfm
  - Whole unit 30 cfm: depressurization = 1 Pa
  - Whole unit + kitchen and bath = 30 + 100 + 150 = 180 cfm: depressurization = 18 Pa
  - CAZ testing limits 5 Pa (or less in current BPI)
- Conclusion: naturally vented combustion appliances need to be outside conditioned space. Outside (balcony) or interior closet with gasketed door and combustion air supply.

How should we test MF?

- Transfer air is critical
  - odor & pollutants >> energy issues
  - Tobacco smoke a big driver
- Therefore: Test each unit w/o opening or pressurizing other units (or sample if large number of units in one building)
- Simple & effective
- Set a threshold
  - 62.2 is 20 cfm/100 sq.ft. envelope area (walls + ceiling + floor)
  - Sets an upper limit for energy calculations
  - Rule of thumb – distribute leakage proportional to area – so exterior leakage of top corner apt is half of total and a second floor central apartment is one sixth of total.

Other issues

- Air leakage
  - Always compartmentalize as much as possible
  - Avoid dropped ceilings and other interstitial spaces
  - Seal floor planes to reduce stack/wind effects
  - Use vestibules on main entrance and elevators
  - How to measure?
    - or is a single tight spec OK?
- 62.1 + 62.2 merging/adapting
  - All RESIDENTIAL to be 62.2
  - Rest of building 62.1

The BEST way(s)?

- Get as tight as possible
- No unvented combustion appliances
  - Induction cooktop
- Kitchen and bathroom exhausts
  - Continuous bath exhaust will meet the standard
  - Simple and robust (low maintenance)

Better ways:

- HRV/ERV with slight positive pressure
  - Possibly supply only when kitchen or bath exhaust on
- Supply with tempering?
  - Hard to find space for ducts and fan power an issue
  - For any supply air – can be difficult to find location on wall that is acceptable and inlet filter maintenance and issue