

FINDING ACCEPTABLE IAQ WITH ASHRAE 62.2-2013

Acceptable indoor air quality (IAQ) is dependent on many factors, including indoor pollution sources, construction materials, furnishings, lifestyle of occupants and outdoor air quality. Acceptable IAQ is also impacted by the occupants' tolerance to indoor pollutants. ASHRAE 62.2-2013 should be used as a starting point for the design of a ventilation system.

As ASHRAE 62.2-2013 becomes more prevalent in local and national residential building requirements, it is helpful for everyone involved to become familiar with the basic ventilation requirements of this standard. ASHRAE 62.2-2013 calls for two mechanical ventilation methods: "whole-building ventilation" and "local exhaust." Both methods need to be used to help achieve acceptable indoor air quality. And keep in mind that ventilation equipment is to be rated in accordance with HVI procedures. Remote-mounted fans are not required to be tested or rated for sound.

THE STANDARD

ASHRAE Standard 62.2-2013 is a ventilation standard that defines minimum requirements for ventilation systems. The goal of this standard is to achieve acceptable indoor air quality (IAQ) for typical residences. This standard is applicable to single-family houses and multi-family structures of no more than three storeys. The standard does not apply to transient housing such as hotels or dormitories.

WHOLE-BUILDING VENTILATION


ASHRAE 62.2-2013 has provisions for three basic mechanical ventilation strategies that can be used for Intermittent or continuous whole-building ventilation:

1. Exhaust ventilation
2. Supply ventilation
3. Balanced supply and exhaust ventilation

When selecting the whole-building ventilation strategy that is best for an application, consideration should be made for local code requirements, geographic location, special needs of occupants, and specific indoor and outdoor air quality issues.

ASHRAE 62.2-2013 assumes that all buildings are tight and, as such, does not allow for the default assumption of two cfm per 100 sq. ft. that the previous editions did. Rather, it requires the use of a blower door to estimate the annual leakage.



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TECH TIP The airflow of all installed ventilation equipment that is used to achieve the whole-building ventilation rate must be measured with an appropriate airflow measuring device.



For continuously operating ventilation systems, ASHRAE 62.2-2013 provides simple formulas and tables that can be used to determine the minimum whole-building ventilation rates. This minimum ventilation rate is based on the square footage of the dwelling and the number of bedrooms. The number of bedrooms is used to determine typical occupancy levels of the dwelling.

This whole-building ventilation rate can be considered the required mechanical ventilation rate. Alternatively, the whole-building ventilation rate may be reduced by up to two-thirds to account for the effective annual average infiltration rate (Q_{inf}).



ASHRAE 62.2-2013 provides equations and weather data and describes various methods of testing to determine the Q_{inf} for a specific dwelling.

Local exhaust

A local mechanical exhaust system is required to be installed in each kitchen and in each bathroom. This local system can be designed for either continuous or on-demand controlled operation.

The airflow of all installed ventilation equipment that is used to achieve local exhaust rates should be measured with an appropriate airflow measuring device. Alternatively, the airflow rating of ventilation equipment at 0.25" w.c. may be used if the prescriptive duct sizing of ASHRAE 62.2-2013 is followed.

The airflow rate of local exhaust systems can also be applied to the required whole-building ventilation rate requirements, as long as they operate automatically.

For on-demand operating exhaust systems, the minimum airflow rate is 50 cfm for bathrooms and 100 cfm for kitchens.

For continuously operating exhaust systems, the minimum airflow rate for bathrooms is 20 cfm. The minimum airflow rate for kitchens is to result in five air changes per hour (based on kitchen volume).

ENSURING A PROPER VENTILATION RATE

For intermittently operating whole-building ventilation systems that run at least once every three hours, the time average ventilation rate cannot be less than the continuous ventilation rate. If the intermittent ventilation system duty cycle (one on and off time) is longer than three hours, the required ventilation rate increases to achieve an acceptable turnover of the air within the dwelling.

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Working with existing buildings

For existing, occupied, buildings that do not meet the provisions of ASHRAE 62.2, an alternative method of compliance is available.

1. Local exhaust

- If existing exhaust ventilation equipment in bathrooms and kitchens does not meet the minimum airflow requirements, the whole-building ventilation rate can be increased to offset the insufficient local exhaust airflow.
- Existing exhaust ventilation equipment in bathrooms and kitchens does not need to be tested to AMCA standards or rated to HVI procedures.
- If exhaust ventilation equipment is replaced in bathrooms and kitchens, this equipment needs to meet all requirements of ASHRAE 62.2-2013.



2. Whole-building ventilation

- The required ventilation rate for existing buildings may need to be increased to offset insufficient local exhaust.
- For existing buildings, if the calculated required airflow rate is less than or equal to zero cfm, no whole-building ventilation fan is required.

For multi-family buildings:

1. Reductions to the mechanical ventilation rate due to effective annual average infiltration rate (Q_{inf}) are not permitted.
2. Common areas are to be ventilated at a rate of 0.06 cfm per sq. ft.
3. Non-residential areas of mixed use buildings are to use ASHRAE 62.1.
4. Common parking garages that adjoin occupied spaces are required to have exhaust ventilation at a rate of 0.4 cfm per sq. ft.
5. Specific steps need to be taken to minimize the air that is transferred between dwelling units.
6. The following requirements are in place to prevent air transfer through the ventilation system:
 - Exhaust fans in separate dwellings shall not share a common exhaust duct.
 - Exhaust inlets from more than one dwelling can use a single exhaust fan if the fan is located downstream of all of the inlets and the fan is run continuously, or if each inlet has a backdraft damper.
 - Supply outlets to more than one dwelling can use a single supply fan if the fan is located upstream of all of the supply outlets and the fan is run continuously, or if each outlet has a backdraft damper.

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