BSR/ASHRAE Addendum a
to ANSI/ASHRAE Standard 62.2-2022

Public Review Draft

Proposed Addendum a to
Standard 62.2-2022, Ventilation and
Acceptable Indoor Air Quality in
Residential Buildings

Second Public Review (July 2023)
(Draft shows Proposed Changes to Current Standard)

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BSR/ASHRAE Addendum a to ANSI/ASHRAE Standard 62.2-2022, Ventilation and Acceptable Indoor Air Quality in Residential Buildings
Second Public Review Draft

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FOREWORD

Standard 62.2 has recently revised the minimum filtration requirement. This proposed addendum simplifies the filtration credit available in Section 4.1.4, Ventilation-Rate Reduction for Particle Filtration. Currently this section allows a wide range of filter efficiencies to qualify. This addendum proposes to narrow that range and significantly simplify the section. Other than eliminating the credit for low-performing filters, this revision does not substantially change the effect of this section.

New Section 7.6, Filtered Air Delivery Rate, establishes the minimum qualifying filter that is allowed to get credit for PM reductions. (A qualifying filter is roughly MERV 13 or better depending on which test method is used.) The section then calculates the particle reduction factor (PRF) resulting from the design of the system. The equation for PRF is based on the continuity equation (i.e., mass balance) with and without additional air cleaning; it assumes typical values for 62.2-compliant air change rates and particle deposition rates.

New references are cited in this revision and those are listed to be added to Section 10.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and strikethrough (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum a to 62.2-2022

Revise Section 4.1.4 and delete Tables 4-2, 4-3, 4-4 as shown below.

4.1.4 Ventilation-Rate Reduction for Particle Filtration. This section describes the requirements necessary to apply a credit against the minimum total ventilation rate of this standard. This credit applies during any period of not less than one day in which the requirements of Sections 4.1.4.1, 4.1.4.2, and 4.1.4.3 are met. In these cases,

\[ Q_{filtration,credit} = 0.2 \times Q_{tot} \]  

(4-8)

where \( Q_{tot} \) is the total ventilation rate of Section 4.1.1 as modified by Section 4.1.3 and any required additional airflow of Section A3, and \( Q_{filtration,credit} \) is the credit for filtration, which shall be used to reduce \( Q_{tot} \) in Section 4.1 for that period.

4.1.4.1 Air Distribution System. The filtered air shall be supplied to or returned from all rooms in the habitable space through not less than one permanently installed air-moving devicean air-handling system. Systems that combine filtration air distribution and HVAC distribution, such as an air-handling system that

Informative Note: A system of one or more permanently installed air-moving devices that provides or does not provide space conditioning and supplies air from or returns air to the system’s associated filter(s) from every bedroom and living area; complies with this requirement but are not required.
4.1.4.2 Particle Filtration. Recirculated air shall be passed through a filter with a maximum filtration factor of 4.3 as determined in accordance with Section 4.1.4.2.1. The particle reduction factor (PRF) shall be at least 2.1 based on the daily average filtered air delivery rate (FADR; see Section 7.6). Outdoor and recirculated air are also subject to the requirements of Section 6.7, which may require additional filtration depending on the system design.

4.1.4.2.1 Filtration Factor. The filtration factor of an air filter ($f_{fr}$) shall be determined using one of the following methods:

a. Filters tested to ASHRAE Standard 52.2: Identify the filtration factor from the row in Table 4-2 associated with the MERV designation.

b. Filters tested to AHRI 680: Identify the filtration factor from the row in Table 4-3 for which the measured particle size efficiencies are no less than the values listed in the row.

c. Filters with an alternative method providing PM2.5 efficiency as approved by the authority having jurisdiction: Identify the filtration factor from the row in Table 4-4 for which the PM2.5 efficiency is no less than the value listed in the row.

4.1.4.3 Airflow Rate. The minimum airflow rate passing through the filter is shown in Equation 4-9:

$$Q_{fr} = \frac{f_{fr} Q_{tot}}{Q_{fr}}$$  \hspace{1cm} (4-9)

where $Q_{fr}$ is the time average flow rate of filtered, recirculated air delivered by the air-handling system. The period of time for averaging the flow shall not exceed one day. If the period exceeds 12 hours, controls shall be provided to ensure that the system also provides at least 10% of $Q_{fr}$ every 12-hour period.

Table 4-2 Filtration Factor for Filters Tested to ASHRAE Standard 52.2

<table>
<thead>
<tr>
<th>MERV</th>
<th>$f_{fr}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>4.3</td>
</tr>
<tr>
<td>12</td>
<td>3.0</td>
</tr>
<tr>
<td>13</td>
<td>2.1</td>
</tr>
<tr>
<td>14</td>
<td>1.8</td>
</tr>
<tr>
<td>15</td>
<td>1.7</td>
</tr>
<tr>
<td>16</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Table 4-3 Filtration Factor for Filters Tested to AHRI 680

<table>
<thead>
<tr>
<th>Particle Size Efficiency (0.30 to 1.0 µm)</th>
<th>Particle Size Efficiency (1.0 to 3.0 µm)</th>
<th>$f_{fr}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>65</td>
<td>4.3</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>3.0</td>
</tr>
<tr>
<td>85</td>
<td>85</td>
<td>2.1</td>
</tr>
<tr>
<td>90</td>
<td>90</td>
<td>1.8</td>
</tr>
<tr>
<td>95</td>
<td>95</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Table 4-4 Filtration Factor for Filters with a PM2.5 Efficiency Designation

<table>
<thead>
<tr>
<th>PM2.5 Efficiency</th>
<th>$f_{fr}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 4.1.4 Installation and Maintenance

All filters shall be readily accessible from within the occupiable space. Filters shall be installed using methods to minimize air bypass. In addition to the instruction and labeling requirements of Section 6.2, the filter designation required to meet the filtration requirements for this system shall be prominently displayed on or near the filter housing access door.

Add new Section 7.6 as shown below.

#### 7.6 Filtered Air Delivery Rate

Where qualifying filters are used in conjunction with permanently installed air-moving devices, this section shall be used to determine the filtered air delivery rate (FADR) and the particle reduction factor (PRF) as needed. The FADR at any one time shall be the sum of the individual FADRs from permanently installed air-moving devices operating at that time, calculated using Equation 7-1.

\[
FADR = \sum_{i=1}^{n} FADR_i \quad (7-1)
\]

where

- \( FADR \) = filtered air delivery rate at any one time
- \( n \) = the number of permanently installed air moving devices providing an FADR at any one time
- \( FADR_i \) = the FADR for the \( i \)th permanently installed air-moving device, cfm/ft\(^2\) (L/s/m\(^2\))

If no air-moving devices are in operation, the FADR shall be zero.

#### 7.6.1 Permanently Installed Air-Moving Devices

The FADR for a permanently installed air-moving device using a qualifying filter shall be determined using Equation 7-3.

\[
FADR_i = 0.85 \cdot \frac{Q_{recirculated,i}}{A_{floor}} \quad (7-3)
\]

where

- \( FADR_i \) = filtered air delivery rate for the \( i \)th permanently installed air-moving device, cfm/ft\(^2\) (L/s/m\(^2\))
- \( Q_{recirculated,i} \) = recirculated airflow of the \( i \)th permanently installed air-moving device, cfm (L/s)
- \( A_{floor} \) = dwelling-unit floor area, ft\(^2\) (m\(^2\))

#### 7.6.2 Qualifying Filters

A filter is qualifying if it meets any of the following criteria:

1. It has a certified filtration efficiency not less than 50% for 1-micron particles.
2. It has a designation not less than MERV 13 as determined by ASHRAE Standard 52.2.
3. It has an efficiency rating not less than 85% in the 1.0-3.0-micron range as determined by AHRI 680.
4. It has an ePM1 efficiency not less than 50% as determined by ISO 16890.
5. It is accepted as a high efficiency particle air (HEPA) filter by the authority having jurisdiction.

#### 7.6.3 Particle Reduction Factor

The particle reduction factor (PRF) shall be calculated using Equation 7-4a (I-P) or 7-4b (SI).

\[
PRF = 1 + 8.8 \cdot FADR_a \quad (7-4a)
\]

where
PRF = particle reduction factor, unitless
\( FADR_a = \text{daily average filtered air delivery rate, cfm/ft}^2 \)

\[
PRF = 1 + 1.7 FADR_a \tag{7-4b}
\]

where

PRF = particle reduction factor, unitless
\( FADR_a = \text{daily average filtered air delivery rate, L/s/m}^2 \)

Add new reference to Section 10 as shown below.

10. References

International Organization for Standardization (ISO)
Ch. de Blandonnet 8, CP 401
CH-1214 Vernier, Geneva, Switzerland
+41 22 749 01 11; www.iso.org

ISO 16890 (2016) Air Filters for General Ventilation. Section 7.6.3