BSR/ASHRAE Addendum n
to ANSI/ASHRAE Standard 62.1-2019

Public Review Draft

Proposed Addendum n to
Standard 62.1-2019, Ventilation and
Acceptable Indoor Air Quality

First Public Review (June 2022)
(Draft shows Proposed Changes to Current Standard)

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FOREWORD

The Indoor Air Quality procedure (IAQP) requires that a mass balance calculation be performed. Any mass balance that includes filtration or air cleaning requires a particle filtration efficiency or gaseous removal efficiency. This addendum requires that the efficiencies of these devices be tested to current standards. However, with no specific testing requirements, there is no assurance that designs will work.

ASHRAE’s Position Document on Filtration and Air Cleaning1 (January 2015) states “All filtration and air-cleaning technologies should be accompanied by data documenting their performance regarding removal of contaminants; these data should be based on established industry test standards.” Previous draft addenda to the standard included testing to ASHRAE standards but were viewed by some as being overly restrictive. This addendum is more inclusive, citing ISO standards for example. To ensure objectivity for test equipment suppliers, no specific design of the test apparatus is specified. Instead requirements of apparatus properties and validation tests are specified.

https://www.ashrae.org/File%20Library/About/Position%20Documents/Filtration-and-Air-Cleaning-PD.PDF

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and strike-through (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 n to 62.1-2019

Add New Section 6.3.4 as shown below. Renumbe other sections and tables as appropriate.

6.3.4 Air cleaning. Where particulate matter or gas phase air cleaning is included in the design, the removal efficiencies shall be specified as follows. Particulate matter filters shall report an efficiency reporting value (MERV) in accordance with ASHRAE Standard 52.212 or reporting in accordance with ISO 16890x. Gas phase air cleaners shall report an efficiency test for all compounds included in the design in accordance with any of the following:

1. ASHRAE Standard 145.2\textsuperscript{XX}
2. ISO 10121-2\textsuperscript{OO}
3. Testing by methods in Section 6.1.2,10.4, and 10.5 and reported as required in Section 11 of ASHRAE Standard 145.2
4. Testing to a national consensus standard approved by the authority having jurisdiction.
5. For technologies not covered by any of the above, tests developed to demonstrate the removal efficiency shall be performed by a third-party. The custom efficiency test shall be conducted for all compounds included in the design and shall comply with the following:

A. Test of the background concentration without the air cleaning in operation
B. Test of the output concentration with the air cleaning in operation
C. Be conducted under air cleaning operating conditions that matches the IAQP design operating conditions. 

        Informative note: Air cleaning operating conditions include fan voltage, flow rate, and other settings that are consistent with the manufactures operating specifications.

D. Be conducted using the relevant laboratory methods for analysis and quantification as specified in Table 7.1. Inorganic compounds and PM$_{2.5}$ may be measured instead using direct read instruments that are calibrated in accordance with the device manufacturer’s recommendations, capable of measuring below the design limit, and consistent with the performance requirements specified in Table 7.2.

Any custom efficiency test description, covering points 1 to 4 above and challenge test concentration shall be documented and approved by the authority having jurisdiction. All test results along with relevant equipment settings shall be provided upon request.

**Table 7.1. Allowed laboratory test methods**

<table>
<thead>
<tr>
<th>Compound</th>
<th>Allowed Test Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOCs except formaldehyde, acetaldehyde and acetone</td>
<td>ISO 16000-6; EPA IP-1$^G_G$; EPA TO-17$^E_E$; ISO 16017-1$^A_A$; ISO 16017-2$^B_B$; ASTM D6345-10$^K_K$</td>
</tr>
<tr>
<td>Formaldehyde, acetaldehyde and acetone</td>
<td>ISO 16000-3; EPA TO-11$^F_F$; EPA IP-6$^O_O$; ASTM D5197$^L_L$</td>
</tr>
<tr>
<td>carbon monoxide</td>
<td>ISO 4224$^D_D$; EPA IP-3$^H_H$</td>
</tr>
</tbody>
</table>

**Table 7.2. Direct reading instruments minimum specifications**

<table>
<thead>
<tr>
<th></th>
<th>Ozone</th>
<th>PM$_{2.5}$</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy (±)</td>
<td>5 ppb</td>
<td>Greater of 5 µg/m$^3$ or 20% of reading</td>
<td>Greater of 3 ppm or 20% of reading</td>
</tr>
<tr>
<td>Resolution (±)</td>
<td>1 ppb</td>
<td>5 µg/m$^3$</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>

*Add the following reference to Section 9. The remainder of Section 9 is unchanged.*

**9. References**


FF. EPA TO-11 (1999). Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology] in Compendium...
| HH. | EPA IP-3 (1990). Determination of Carbon Monoxide (CO) or Carbon Dioxide (CO2) in Indoor Air in Compendium of Methods for the Determination of Air Pollutants in Indoor Air. RTP, NC, USEPA. |