



**BSR/ASHRAE Addendum i  
to ANSI/ASHRAE Standard 62.1-2022**

**Public Review Draft**

# **Proposed Addendum i to Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality**

**First Public Review (August 2024)  
(Draft shows Proposed Changes to Current Standard)**

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**(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)**

## FOREWORD

Table 7-1 (Section 7.3.1 of ASHRAE 62.1-2019 Addendum aa) lists the following allowed test methods when measuring indoor concentrations of formaldehyde, acetaldehyde, and acetone under the Indoor Air Quality Procedure: ISO 16000-3, EPA TO-11, EPA IP-6, ASTM D5197. These listed methods utilize DNPH (2,4-Dinitrophenylhydrazine) coated cartridges to derivatize the ketone and aldehyde analytes followed by analysis using high-performance liquid chromatography (HPLC) and UV detection. The specified methods can potentially constrain engineers and testing agents when contracting a laboratory to process collected air samples, as locally available labs may not be equipped to follow the given standards. In order to ensure a wide pool of affordable testing options, the following proposes a set of alternative testing methods when testing formaldehyde, acetaldehyde, and acetone. The availability of more affordable testing options, while maintaining rigorous testing standards, will potentially help lower the cost barriers to employing the IAQP in ventilation design.

The proposed method for detecting formaldehyde uses a method based on the reaction of formaldehyde and acetyl-acetone (2,4-pentadione) and ammonia which produces the derivative 3,5-diacetyl-1,4-dihydrolutidine (DDL) followed by fluorescence detection. Although not as common in the US as the DNPH methods, it's widely used in Europe and has been compared with DNPH results with good agreement. The testing method is compliant with the California Air Resources Board's (CARB) § 93120, European DIN Standard EN-717, and ASTM methods D-5582 and E-1333. Data correlating the results of the AL4021 monitor with the DNPH method are available for review on the manufacturer's website at <https://www.aero-laser.de/gas-analyzers/hcho-al4021/correlation-with-other-methods.html>.

**[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 i to 62.1-2022

**Modify Table 7-1 and 7-2 as follows:**

**Table 7-1 Allowed Laboratory Test Methods**

Compound	Allowed Test Methods
VOCs except formaldehyde, acetaldehyde and acetone	ISO 16000-6; EPA IP-1, EPA TO-17; ISO 16017-1; ISO 16017-2; ASTM D6345-10
Formaldehyde, <del>acetaldehyde and acetone</del>	ISO 16000-3; EPA TO-11; EPA IP-6; ASTM D5197 <u>or testing method that is compliant with the California Air Resources Board's (CARB) § 93120</u>
<u>Acetaldehyde and acetone</u>	<u>ISO 16000-3; EPA TO-11; EPA IP-6; ASTM D5197</u>
Carbon monoxide	ISO 4224; EPA IP-3

**Table 7-2 Direct Reading Instruments Minimum Specifications**

	<b>Ozone</b>	<b>PM<sub>2.5</sub></b>	<b>Carbon Monoxide</b>	<b><u>Formaldehyde (a)</u></b>
Accuracy (±)	5 ppb	Greater of 5 µg /m <sup>3</sup> or 20% of reading	Greater of 3 ppm or 20% of reading	<u>0.1 ppb</u>
Resolution (±)	1 ppb	5 µg/m <sup>3</sup>	1 ppm	<u>2% full scale within calibrated linearity range</u>

**Normative notes for Table 7-2:**

- a. Include the “calibrated linearity range” in all reports.