ADDENDA

ANSI/ASHRAE Addendum u to
ANSI/ASHRAE Standard 62.1-2016

Ventilation for Acceptable Indoor Air Quality

Approved by the ASHRAE Standards Committee on June 23, 2018; by the ASHRAE Board of Directors on June 27, 2018; and by the American National Standards Institute on July 25, 2018.

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FOREWORD

There is need for a simplified list to determine compliance with basic requirements of the standard. This addendum adds a new informative appendix that provides a compliance checklist and simple calculations to approximately check ventilation rate values. Other standards have more complex compliance documents.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum u to Standard 62.1-2016

Add a new Informative Appendix M as shown.

(This appendix 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.)

INFORMATIVE APPENDIX M COMPLIANCE

This appendix contains compliance suggestions that are intended to assist users and enforcement agencies in applying this standard.

M1. SECTION 4

- ❑ Is documentation of outdoor air quality included as required in Section 4.3?

M2. SECTION 5

- ❑ Are air balancing provisions included in design documentation as required in Section 5.1?
- ❑ If the system is a plenum system, are provisions for providing minimum breathing zone airflow specified?
- ❑ Do exhaust ducts comply with requirements of Section 5.2?
- ❑ Are ventilation systems controls specified as per Section 5.3?
- ❑ Do specifications include resistance to mold and erosion for airstream surfaces per Section 5.4?
- ❑ Are separation distances between outdoor air intakes and sources listed and in compliance with Section 5.5?
- ❑ Is there any noncombustion equipment that requires exhaust (Section 5.6)?
- ❑ Is combustion air provided for fuel burning appliances (Section 5.7)?
- ❑ Are appropriate filters specified upstream of cooling coils or wetted surfaces (Section 5.8)?
- ❑ Are dehumidification capability and building exfiltration calculations provided (Section 5.9)?
- ❑ Do specifications for drain pans comply with requirements of Section 5.10?
- ❑ Are coils specified per requirements of Section 5.11?
- ❑ If present, do humidifiers and water spray systems comply with requirements of Section 5.12?
- ❑ Is access provided for inspection, cleaning, and maintenance of all ventilation equipment and air distribution equipment (Section 5.13)?
- ❑ Is moisture management (Section 5.14) included in building envelope design, including specifically,
  - ❑ weather barrier;
  - ❑ vapor retarder;
  - ❑ sealing exterior joints, seams, and penetrations;
  - ❑ insulation on pipes, ducts, or other surfaces whose temperatures are expected to fall below dew point of surrounding air?
- ❑ If there is an attached parking garage, do airflow control measures comply with requirements of Section 5.15?
- ❑ Is recirculation from spaces containing Class 2 air limited to spaces with the same purpose and with the same pollutants following requirements of Section 5.16.3.2?
- ❑ Is air from spaces containing Class 3 air contained and not transferred to any other space (Section 5.16.3.3)?
- ❑ Is all air from spaces containing Class 4 air exhausted directly to the outdoors (Section 5.16.3.4)?
- ❑ If ETS is expected to be present, does the design comply with all separation requirements of Section 5.17?

M3. SECTION 6 VRP

- ❑ Are occupancy categories consistent with the space design documents?
- ❑ Are there any unusual sources of contaminants or compounds? If yes, ventilation must be added per Section 6.3.6.

M3.1 Filtration

- ❑ If PM10 standard is exceeded as reported in Section 4, is required filtration per Section 6.2.1.1 provided?
- ❑ If PM2.5 standard is exceeded as reported in section 4, is required filtration per Section 6.2.1.2 provided?
- ❑ If ozone standard is exceeded, and the area is Serious, Severe15, Severe17, or Extreme, filtration per Section 6.2.1.3 is required unless an exception is documented.

M3.2 Ventilation Rates. Check compliance with the outdoor air ventilation rate at the intake (V_{ot}) using the following process.

- ❑ Calculate $V_{otdefault}$ using Equation M.3.2-1 using the combined default rate (R_c) from Informative Appendix N and the occupiable area (A_z) of each zone.

$$V_{otdefault} = \sum_{all\ zones} R_c x A_z \quad \text{(M3.2-1)}$$

- ❑ Calculate additional ventilation required by Section 6.2.2.1.2. Additional ventilation is $V_{otadditional}$.
- ❑ Calculate V_{otmax} using Equation M3.2-2.

$$V_{otmax} = V_{otdefault} + V_{otadditional} \quad \text{(M3.2-2)}$$

- ❑ Calculate V_{otmin} using Equation M3.2-3.

$$V_{otmin} = V_{otmax} \times 0.75 \quad \text{(M3.2-3)}$$

- ❑ Designed system ventilation rate at the outdoor air intake (V_{ot}) should fall between V_{otmin} and V_{otmax}.
- ❑ Values of V_{ot} for multiple-zone recirculating VAV systems should be close to V_{otmax}.
- ❑ Values of V_{ot} for 100% outdoor air systems (DOAS) providing tempered air should be equivalent to V_{otmin}.
- ❑ Values of V_{ot} for other systems should fall between these values.
- ❑ If dynamic reset is included as a part of the design, does it comply with all requirements of Section 6.2.7?

Exceptions to M3.2:

1. Minimum outdoor airflow for multiple-zone recirculating systems designed using Normative Appendix A could be below V_{otmin}. A calculation spreadsheet should be provided to confirm that E_v for the system is >0.75.
2. Minimum outdoor airflow for systems designed using Normative Appendix X could be below V_{otmin}. Calculation assumptions of any modeling criteria and results should be provided to confirm that E_z values are >1.0.

M4. SECTION 6 IAQP

For the IAQ procedure:

- ❑ Do the design documents provide evaluation of the following?
  - ❑ Compounds included in the design (Section 6.3.1)
    - ❑ List includes all compounds of common interest
  - ❑ Indoor sources and emissions rates for each compound
  - ❑ Outdoor sources and expected concentrations for each compound
  - ❑ Exposure periods and concentration limits (Section 6.3.2)
  - ❑ Evaluation of mixtures
  - ❑ Specification of perceived indoor air quality acceptability
  - ❑ Calculation of resultant concentrations from the design by mass balance
- ❑ Do specifications require that the objective evaluation process be completed during occupancy (Section 6.2.5.2)?
- ❑ Do specifications include test methods (6.3.5.2.1)?
- ❑ Do specifications require that the subjective evaluation process be completed during occupancy? (6.2.5.3)
  - ❑ If a substantially similar zone is used for subjective evaluation, are previous test results, conditions, and system design provided to verify that the zone is substantially similar?
- ❑ If applicable, are appropriate specifications for dynamic reset monitoring and controls included?

M5. SECTION 6 NVP

Natural ventilation systems shall follow either the prescriptive or the engineered system compliance path.

For the prescriptive compliance path:

- ❑ Is a mechanical system compliant with either Section 6.2 or 6.3 included?
  - ❑ If no, does design comply with Exceptions 1 or 2?
- ❑ Do maximum distances from openings comply with Sections 6.4.1.2, 6.4.1.3, or 6.4.1.4?
- ❑ Do opening sizes comply with the requirements of Section 6.4.2?
  - ❑ Is net free area of openings specified?
  - ❑ Are sill-to-head heights specified?
  - ❑ Are aggregate widths specified?
- ❑ Are controls readily accessible?

For the engineered compliance path:

- ❑ Do the design documents provide evaluation of the following:
  - ❑ Hourly environmental conditions, including, but not limited to, outdoor air dry-bulb temperature; dew-point temperature; outdoor concentration of contaminants of concern (including but not limited to PM2.5, PM10, and ozone), where data are available; wind speed and direction; and internal heat gains during expected hours of natural ventilation operation.
  - ❑ The effect of pressure losses along airflow paths of natural ventilation airflow on the resulting flowrates, including, but not limited to, inlet vents, air transfer grills, ventilation stacks, and outlet vents.
  - ❑ Qualification of natural ventilation airflow rates of identified airflow paths accounting for wind and thermally induced driving pressures.
  - ❑ Outdoor air is provided in sufficient quantities to ensure pollutants and odors of indoor origin do not result in unacceptable indoor air quality as established under Section 6.2.2.1 and/or 6.3.
  - ❑ Outdoor air introduced into the space through natural ventilation system openings does not result in unacceptable indoor air quality according to Sections 6.2.1.1 through 6.2.1.4.
  - ❑ Effective interior air barriers and insulation are provided that separates naturally ventilated spaces from mechanically cooled spaces, ensuring that high-dew-

point outdoor air does not come into contact with mechanically cooled surfaces.

❑ Are controls readily accessible?

M6. SECTION 6 EXHAUST

Exhaust ventilation systems shall follow either the prescriptive or the performance compliance path.

For the prescriptive compliance path:

❑ Does airflow comply with requirements of Table 6.5.1 and 6.5.2?

❑ If no for any space, does it qualify as an exception?

❑ Have source strengths been evaluated as required in Section 6.5.1.1?

For the performance compliance path:

❑ Do the design documents provide evaluation of the following?

❑ Compounds of interest for the design

❑ Indoor sources and emissions rates for each compound

❑ Outdoor sources and emissions rates brought in by ventilation air

❑ Exposure periods and concentration limits

❑ Evaluation of mixtures

❑ Calculation of resultant concentrations from the design

❑ Do specifications require that the objective evaluation process be completed during occupancy (Section 6.2.2.5.3)?

❑ Do specifications require that the subjective evaluation process be completed during occupancy (Section 6.2.2.5.4)?

❑ If applicable, are appropriate specifications for dynamic reset monitoring and controls included?

M7. VENTILATION FOR EXISTING BUILDINGS

This section provides guidance for determining compliance with the standard for existing buildings. Many sustainability and energy programs require that ventilation rates for systems comply with ASHRAE Standard 62.1; however, the methods for determining compliance vary widely. This appendix is intended to provide a standardized approach and clear guidance for practitioners who work with existing buildings.

A ventilation system in an existing building may be deemed to comply with Standard 62.1 if the system complies with all the sections in this appendix. The building may be deemed to comply if all systems in the building comply with all the sections in this appendix (Sections M7.1, M7.2, and M7.3).

M7.1 Filtration. Filtration shall comply with Sections M7.1.1 and M7.1.2

M7.1.1 Filtration Before Coils. Filtration complies with Section 5.8

M7.1.2 Filtration of Outdoor Air. Filtration complies with Section 6.2.1.

M7.2 Outdoor Airflow. The following process may be used to determine if outdoor airflow rates comply with the standard. Occupied areas may be determined by measurement, dimensioned floor plans, or from building manager's data.

M7.2.1 System Outdoor Airflow. Measure system outdoor airflow. Measurements may be made directly or by installed flow measurement devices in the system that are calibrated. This rate is $V_{otmeasured}$.

M7.2.2 Determine System Type. Determine the system type and then follow the guidance in the appropriate section.

M7.2.2.1 Single Zone Systems. Determine $V_{otdesign}$ using Section 6.2.3. If $V_{otmeasured} \geq V_{otdesign}$, the system complies.

M7.2.2.2 100% Outdoor Air Systems. Determine $V_{otdesign}$ using Section 6.2.4. If $V_{otmeasured} \geq V_{otdesign}$, the system complies.

M7.2.2.3 Multiple Zone Recirculating Systems. Determine $V_{otdesign}$ using any process listed in this section. If, in any calculation, $V_{otmeasured} \geq V_{otdesign}$, the system complies.

Note: Calculations are ordered from simplest to most complex.

M7.2.2.3.1 Appendix D. Determine $V_{otdesign}$ using Informative Appendix D.

M7.2.2.3.1.1 Systems with Measured Zone Primary Airflow. If measured zone primary airflow is available by VAV box readings or by a testing, adjusting, and balancing (TAB) report, one may calculate using either of the following approaches.

M7.2.2.3.1.2 Simplified Procedure. Determine $V_{otdesign}$ using Section 6.2.5.3.

M7.2.2.3.1.3 Alternative Procedure. Determine $V_{otdesign}$ using Normative Appendix A.

Note: Appendix A provides credit for secondary recirculation.

M7.3 Controls. Confirm that ventilation system controls comply with requirements of Section 5.3.

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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7/18