

ADDENDA

**ANSI/ASHRAE/ASHE Addendum I to
ANSI/ASHRAE/ASHE Standard 170-2021**

Ventilation of Health Care Facilities

Approved by ASHRAE and the American National Standards Institute on December 29, 2023, and by the American Society for Health Care Engineering on November 22, 2023.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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FOREWORD

Section 10 of the standard provides requirements for protecting ventilation systems during construction. Addendum I revises this section to reorganize the subheadings, improving the sequencing of requirements temporally, from construction to start-up to operation prior to owner turnover; to more clearly describe precautions required when using the HVAC system in active construction areas; and to clarify that construction areas need to be maintained under negative differential pressure relative to occupied areas except where an ICRA has determined other appropriate protection measures.

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

Addendum I to Standard 170-2021

Modify Section 10 as shown.

10. ~~CONSTRUCTION AND SYSTEM START-UP~~ VENTILATION SYSTEMS DURING CONSTRUCTION

10.1 Construction Phase. The requirements of this section apply to ventilation systems during construction, start-up, and operation prior to owner turnover.

10.1.1 Application. ~~The requirements of this section apply to ventilation systems and the spaces they serve in new buildings, and in additions to or alterations in existing buildings, during the construction phase of the project.~~

10.1.2~~1~~ Protection of Materials During Construction and During Installation. When recommended by the manufacturer, building materials shall be protected from rain and other sources of moisture by appropriate in-transit and onsite procedures. Porous materials with visible microbial growth shall not be installed. Nonporous materials with visible microbial growth shall be decontaminated. Protect building materials, ductwork, insulation, etc. from rain and other sources of moisture by appropriate in-transit and onsite procedures.

- a. Porous materials with visible microbial growth shall not be installed.
- b. Nonporous materials with visible microbial growth shall be cleaned and sanitized using approved solutions and methods. Surfaces shall be visually clean and allowed to dry before installation.

10.1.3~~3~~ Duct Cleanliness. ~~The duct system shall meet the following requirements for cleanliness:~~

- a. ~~The duct system shall be free of construction debris. New supply duct system installations shall comply with level "C," the Advanced Level of SMACNA *Duct Cleanliness for New Construction Guidelines*¹⁸.~~
- b. ~~The supply diffusers in operating rooms (ORs), delivery rooms (Cesarean), trauma rooms (crisis or shock), wound-intensive care rooms, protective environment (PE) rooms, and critical and intensive care rooms shall be opened and cleaned before the space is initially used and at regular intervals thereafter.~~
- c. ~~The permanent HVAC systems shall not be operated unless protection from contamination of the air distribution system is provided.~~

10.1.4~~4~~ Protection of Occupied Areas

10.1.4.1 Application. ~~The requirements of Section 10.1.4 apply when construction entails sanding, cutting, grinding, or other activities that generate significant amounts of airborne particles or procedures that generate significant amounts of gaseous contaminants.~~

10.1.4.2 Protective Measures. ~~Measures shall be employed to reduce the migration of construction-generated contaminants to occupied areas. When required, follow the ICRA established procedures from Section 5.5 to minimize the disruption of facility operation and the distribution of dust, odors, and particulates.~~

10.1.4.3 HVAC During Construction

- a. ~~Provide conditions to aid in preventing microbial growth on materials that are or will be installed in the new or remodeled facility or addition.~~

- b. As determined from Section 5.6, if the permanent HVAC equipment is to be used during construction for temperature and/or humidity control, then prior to its use take the following minimum steps:
 - 1. Supply 100% outdoor air—no return air; blank off return duct openings with solid material.
 - 2. Provide a method for pressure relief, such as open window(s) or door(s).
 - 3. Provide final level of filtration in air-handling units (AHUs).
 - 4. Cover supply duct openings when air handler(s) are OFF.
 - 5. Provide prefilters over outdoor air intakes as needed during site construction activities.
 - 6. Clean air-handling components prior to occupancy.
 - 7. Operate AHU(s) only if safety devices and sequences are in place and operational.
- e. Prior to starting and operating any ventilation systems from the time the testing, adjusting, and balancing work is taking place to the completion of the project, isolate expected construction activities that produce dust and debris from the ventilation systems.

10.2 Ductwork Systems

10.2.1 Ductwork Cleanliness. New supply duct system installations shall comply with Level C, the Advanced Level of SMACNA's *Duct Cleanliness for New Construction Guidelines*¹⁸.

10.2.2 Install ductwork and insulation materials in accordance with manufacturer requirements. Protect materials from damage and moisture during the installation process.

10.2.3 Duct Openings. Cover openings in air distribution systems within the construction area.

Exception to 10.2.3: Supply air openings when the systems are operating.

Informative Note: Supply air openings in systems that operate intermittently must be covered whenever the ventilation system is inactive.

10.3 HVAC and Ventilation Systems and Components. Protect installed HVAC systems from dust-generating activities. Maintain ventilation system cleanliness during construction and up to owner turnover.

Informative Note: Dust-generating activities include, but are not limited to, sanding, cutting, and grinding.

10.3.1 Use of HVAC Systems During Construction. Avoid operating HVAC systems during construction. When systems are used in active construction areas, the following shall apply:

- a. Only use systems in construction areas with no active dust generation.
- b. Blank off or provide filter media covering return air diffusers equal to MERV 8 or greater.
- c. Apply filter media over outdoor air intakes whenever outdoor dust-generating activities are occurring within 35 ft (11 m).
- d. Install filter media in the AHU equal to the occupancy requirements.
- e. Provide conditions to aid in preventing microbial growth on materials that are installed.

Informative Note: Maintain system relative humidity levels to prevent microbial growth on surfaces.

10.3.2 Operation. The outdoor air intake of ventilation systems supplying make-up air to the construction areas shall be adjusted to comply with Section 6.7.7.

10.3.3 Occupied Areas. Protect occupied areas by maintaining indoor construction zones under negative differential air pressure relative to occupied areas.

Exception to 10.3.3: Where the ICRA required by Section 5.5 determine other measures for protection.

10.2 System Start-Up

10.2.1 Application. This section applies to HVAC equipment and systems designed and installed to meet the requirements of this standard.

10.2.2 Testing, Adjusting, and Balancing (TAB). HVAC systems shall be balanced in accordance with one of the following national standards: ASHRAE Standard 111¹⁹, AABC, NEBB, or TABB for airflows, water flows, and relative room air pressurization.

10.2.3 Testing of Drain Pans. To minimize conditions of water stagnation that may result in microbial growth, inspect drain pans to verify proper drainage under operating conditions.

10.2.4 Manufactured Equipment Start-Up. For all manufactured HVAC equipment components, follow manufacturer's start-up recommendations and requirements. All equipment and air distribution systems shall be clean of dirt and debris.

10.2.5 Documentation of New or Remodeled HVAC Systems. Owners shall retain an acceptance testing report for their files. In addition, the design shall include requirements for operations and maintenance (O&M) staff training that is sufficient for the staff to keep all HVAC equipment in a condition that will maintain the original design intent for ventilation. Training of operating staff shall include an explanation of the design intent. The training materials shall include, at a minimum, the following:

- a. ~~O&M procedures~~
- b. ~~Temperature and pressure control operation in all modes~~
- c. ~~Acceptable tolerances for system temperatures and pressures~~
- d. ~~Procedures for operations under emergency power or other abnormal conditions that have been considered in the facility design~~

10.4 Start-Up and Commissioning

10.4.1 Testing, Adjusting, and Balancing (TAB). HVAC systems shall be balanced in accordance with one of the following national standards: ASHRAE Standard 111¹⁹, AABC, NEBB, or TABB for airflows, air changes, and relative room air pressurization relationships.

10.4.2 Commissioning. Provide commissioning for all HVAC systems in accordance with Facilities Guidelines Institute (FGI) and NFPA 99. Commissioning shall be done in accordance with ASHRAE guidelines and other industry standards.

10.5 Before Owner Turnover and Occupancy. Prior to occupancy and after completion of dust-generating activities, perform the following activities:

- a. Remove temporary filter media covering outdoor air intakes, and replace filter media within ventilation systems prior to the start of testing, adjusting, and balancing.
- b. Visually verify that interior ductwork surfaces are clean and free of accumulation dust and debris.
- c. Visually verify that all insulation materials are intact and not physically damaged.
- d. Clean coils, dampers, and other components not protected during dust-generating activities.
- e. Verify cleanliness of all supply and return air diffuser surfaces.

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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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