ADDENDA

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

Ventilation for Acceptable Indoor Air Quality

Approved by the ASHRAE Standards Committee on June 26, 2019; by the ASHRAE Board of Directors on August 1, 2019; and by the American National Standards Institute on August 26, 2019.

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 (https://www.ashrae.org/continuous-maintenance).

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

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FOREWORD

The 60°F (15°C) indoor-air dew-point limit avoids the microbial growth problems frequently observed when humid outdoor air infiltrates into buildings that are mechanically cooled. Microbial growth is common during cooling seasons and especially when cooling and occupancy are intermittent. Examples include in schools during summer vacations, apartments and condominiums that are intermittently occupied during summer months, college dormitories and military barracks that are unoccupied for long periods, and health care buildings and hotels in hot or humid climates that contain both naturally ventilated and mechanically cooled spaces

Humidity-related requirements of earlier versions of Standard 62.1 were intended to address both mold growth and comfort concerns by limiting indoor humidity to 65% rh. That requirement, however, did not explicitly extend to unoccupied hours when microbial growth often accelerates. More importantly, because it did not establish a coincident dry-bulb temperature, the 65% rh limit did not limit the mass of water vapor available for surface absorption during periods when cooling is intermittent to conserve energy.

Microbial growth is governed by the availability of moisture in the surfaces of building materials, coatings, furnishings and mechanical systems. The relative humidity (RH) of the air does not affect microbial growth until the water vapor is absorbed or condenses into the surface. Limiting the indoor-air dew point rather than the RH limits the total mass of water vapor available for condensation or absorption. Further, limiting the dew point to 60°F (15°C) prevents actual condensation until the air contacts a surface that is cooler than 60°F. Few surfaces are cooled that low in buildings, even allowing for typical cold-air leakage into interstitial spaces and the frequently less-than-perfect insulation of pipes, valves, and duct work.

This specific limit is a compromise between energy and microbial growth concerns. Lower indoor dew points would further reduce risk. For example, a 55°F (13°C) maximum dew point is the guidance contained in the 2001 and 2008 Humidity Control Design Guide for Commercial and Institutional Buildings *and in the 2015* ASHRAE Handbook—Applications*, Chapter 62, "Moisture Management in Buildings," and Chapter 23, "Museums, Galleries, Archives and Libraries." The 55°F dew-point limit is also required for all high-performance buildings as defined by the General Services Administration's 2017 PBS-P100,* Facilities Standards for the Public Buildings Service*. But a dew-point limit of 55°F (13°C), while certainly an improvement appropriate for reducing risks and improving comfort in high-quality buildings, could also increase energy consumption in unoccupied buildings in highly humid climates, especially when a building is not airtight. A dew-point limit of 60°F may provide a more affordable balance between the equally important concerns of reducing energy consumption and reducing risks to occupant health from microbial growth.*

As noted by Section 5.9, Exception 1, buildings or spaces that are neither equipped with nor served by mechanical cooling equipment can be exempted from the dew-point limit, because their surfaces tend to stay warm during humid weather, which helps avoid moisture absorption and the risk of microbial amplification.

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 ae to Standard 62.1-2016

Modify Section 5.9 as shown.

~~**5.9 Dehumidification Systems.** Mechanical air conditioning systems with dehumidification capability shall be designed to comply with the following subsections.~~

~~**5.9.1 Relative Humidity.** Occupied-space relative humidity shall be limited to 65% or less when system performance is analyzed with outdoor air at the dehumidification design condition (that is, design dew-point and mean coincident dry bulb temperatures) and with the space interior loads (both sensible and latent) at cooling design values and space solar loads at zero.~~

~~**Exception:** Spaces where process or occupancy requirements dictate higher humidity conditions, such as kitchens; hot-tub rooms that contain heated standing water; refrigerated or frozen storage rooms and ice rinks; and spaces designed and constructed to manage moisture, such as shower rooms, pool rooms, and spa rooms.~~

~~***Informative Note:*** System configuration, climatic conditions, or a combination of both might adequately limit space relative humidity at these conditions without additional humidity control devices. The specified conditions challenge the system dehumidification performance with high outdoor latent load and low space sensible heat ratio.~~

5.9 Maximum Indoor-Air Dew Point in Mechanically Cooled Buildings. Buildings or spaces equipped with or served by mechanical cooling equipment shall be provided with dehumidification components and controls that limit the indoor humidity to a maximum dew point of 60°F (15°C) during both occupied and unoccupied hours whenever the outdoor-air dew point is above 60°F (15°C). The dew-point limit shall not be exceeded when system performance is analyzed with outdoor air at the dehumidification design condition (that is, design dew point and mean coincident dry-bulb temperatures) and with the space interior loads (both sensible and latent) at cooling design values and space solar loads at zero.

Exceptions to 5.9:

1. Buildings or spaces that are neither equipped with nor served by mechanical cooling equipment.

2. Buildings or spaces equipped with materials, assemblies, coatings, and furnishings that resist microbial growth and that are not damaged by continuously high indoor-air dew points.
3. During overnight unoccupied periods not exceeding 12 hours, the 60°F (15°C) dew-point limit shall not apply, provided that indoor relative humidity does not exceed 65% at any time during those hours.

Informative Notes:

1. Examples of spaces are shower rooms, swimming pool enclosures, kitchens, spa rooms, or semi-cooled warehouse spaces that contain stored contents that are not damaged by continuously high indoor-air dew points or microbial growth.
2. This requirement reduces the risk of microbial growth in buildings and their interstitial spaces because it limits the mass of indoor water vapor that can condense or be absorbed into mechanically cooled surfaces. The dew-point limit is explicitly extended to unoccupied hours because of the extensive public record of mold growth in schools, apartments, dormitories, and public buildings that are intermittently cooled during unoccupied hours when the outdoor-air dew point is above 60°F (15°C).

Modify Section 5.9.2 as shown. Renumber remaining sections.

5.10~~9.2~~ Building Exfiltration. Ventilation systems for a building equipped with or served by mechanical cooling equipment shall be designed such that the total building outdoor air intake equals or exceeds the total building exhaust under all load and dynamic reset conditions.

Exceptions to 5.10:

1. Where an imbalance is required by process considerations and approved by the authority having jurisdiction, such as in certain industrial facilities.
2. When outdoor air dry-bulb temperature is below the indoor space dew-point design temperature.

Informative Note: Although individual zones within a building may be neutral or negative with respect to outdoors or to other zones, net positive mechanical intake airflow for the building as a whole reduces infiltration of untreated outdoor air.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

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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