ADDENDA

ANSI/ASHRAE Addendum j to
ANSI/ASHRAE Standard 55-2020

Thermal Environmental Conditions for Human Occupancy

Approved by ASHRAE and the American National Standards Institute on October 31, 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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SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

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

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
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.

(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

Addendum j updates Section 6 of the standard to align with changes in Section 5 of the standard and to clarify aspects of required documentation that were previously confusing. In particular, Section 6 is now split into three sections that provide documentation requirements for Section 5.3 separate from 5.4 and separate from common requirements. Example documentation in Excel format is included as an online supplemental file, which replaces the example form that was in Appendix K.

Informative 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 j to Standard 55-2020

Revise Section 6.1 as shown.

6.1 Design. Building systems (i.e., combinations of mechanical systems, control systems, and thermal enclosures) shall be designed ~~so that at outdoor and indoor design conditions they are able~~ to maintain ~~the~~ occupied space~~s or spaces~~ at ~~indoor~~ thermal conditions ~~specified by~~ that provide thermal comfort in accordance with one of the methods in this standard considering all expected operating conditions (i.e., peak and partial load).

Design compliance shall consider all predictable representative occupants and expected indoor and outdoor environmental conditions, including but not limited to

a. Seasonal and typical outdoor environmental variations
b. Seasonal clothing changes of the representative occupants
c. Short-term average air temperature variability due to HVAC system design and operations including thermostat deadband and cycling
d. Indoor spatial variations in average air temperature, relative humidity, average air speed, and mean radiant temperature, including the presence, or lack thereof, of direct solar radiation

~~The building systems shall be designed so that they are able to maintain the occupied space or spaces within the ranges specified for internal conditions in this standard, and within the range of expected operating conditions (indoor and outdoor).~~

Revise Section 6.2 as shown.

6.2 Documentation. The method and design conditions appropriate for the intended use of the building shall be selected and documented as ~~follows~~ specified in Sections 6.2.1, 6.2.2, and 6.2.3. ~~(***Informative Note:*** Some of the requirements in items (a) through (h) below are not applicable to naturally conditioned buildings.)~~

~~a. The method of design compliance shall be stated for each space and/or system: Section 5.3 or the use of Section 5.4 for occupant-controlled naturally conditioned spaces.~~
~~b. The design operative temperature *to* and humidity (including any tolerance or range), the design outdoor conditions (see *ASHRAE Handbook—Fundamentals*[1], Chapter 14), and total indoor loads shall be stated. The design exceedance hours (***Informative Note:*** see Section 3, "Definitions") shall be documented based on the design conditions used.~~
~~c. Values assumed for comfort parameters used in the calculation of thermal conditions, including operative temperature *to*, humidity, average air speed *Va*, clothing insulation I_{cl}, and metabolic rate, shall be stated for heating and cooling design conditions. If a satisfactory level of comfort is not being provided to any representative occupants, this shall be stated. Where Table 5-1 gives a range, the basis for selecting a single value within that range shall be stated. If the clothing insulation or metabolic rate parameters for a given space are outside the applicable bounds defined by the standard, or if the space is not regularly occupied as defined in Section 2.3, the space shall be clearly identified as not under the scope of the standard.~~
~~d. Local thermal discomfort shall be addressed, at a minimum, by a narrative explanation of why an effect is not likely to exceed Section 5 limits. Where calculations are used to determine the effect of local thermal discomfort in accordance with Section 5, the calculation inputs, methods, and results shall be stated.~~

~~e. System equipment capacity shall be provided for each space and/or system documenting performance meeting the design criteria stated. For each unique space, the design system or equipment heating and/or cooling capacity shall meet the thermal loads calculated under the heating and cooling design conditions stated for compliance with this standard.~~

~~f. Where elevated air speed with occupant control is employed to provide satisfactory thermal conditions, documentation shall be provided to identify the method and equipment for occupant control.~~

~~g. Air speed, radiant temperature asymmetry, vertical air-temperature difference, surface temperatures, and temperature variations with time shall be determined in accordance with generally accepted engineering standards (e.g., *ASHRAE Handbook—HVAC Applications*, Chapter 57). The method used, and quantified selection criteria, characteristics, sizes, and indices that are applicable to the method, shall be stated.~~

~~h. When direct-beam solar radiation falls on a representative occupant, documentation shall include solar design condition (solar altitude, direct beam intensity), the method in Section 5.3.3 used for compliance, and the resultant mean radiant temperature *tr*.~~

~~i. Thermal Environmental Control Classification Level shall be documented for each space type with supporting calculations and design documents indicating the control measure(s) for environmental factors, the means of control, and the degree to which control changes the environmental factor.~~

~~***Informative Note:*** See Informative Appendix K for sample compliance documentation.~~

6.2.1 Core Documentation Requirements (applies to both Section 5.3 and Section 5.4)

a. Each unique space shall be documented. Spaces excluded from compliance documentation shall be clearly identified as such along with the rationale for their exclusion (e.g., not regularly occupied).

b. The method of design compliance shall be stated: Section 5.3 or Section 5.4.

c. Each representative occupant and their location within the space shall be defined, including their clothing insulation (I_{cl}) and metabolic rate (*met*) for each design comfort condition. Where Table 5-1 gives a range, the basis for selecting a single value within that range shall be stated. If any occupants are deemed nonrepresentative, they shall be identified along with the rationale for their exclusion.

d. Describe the design comfort conditions. These conditions are specific combinations of indoor and outdoor factors at which occupant thermal comfort shall be evaluated. Design comfort conditions shall be chosen to cover the most challenging thermal comfort scenarios likely experienced by the occupant, including the possible impact of direct solar radiation. Each unique combination of space and representative occupant shall be evaluated at a minimum of two design comfort conditions: cooling and heating. (***Informative Note:*** The design comfort conditions may not align with system or room peak heating and cooling load conditions and should be considered carefully by the designer—e.g. evaluating direct beam solar on an occupant in a perimeter room during winter).

e. State the operative temperature t_o, including expected ranges, used in the comfort calculation for each combination of space, representative occupant, and design comfort condition.

f. When direct-beam solar radiation falls on a representative occupant, documentation shall include the method in Section 5.3.3 used for compliance and associated documentation for the chosen method. The calculation inputs, methods, and results shall be stated where applicable.

g. Thermal environmental control classification level shall be documented for each unique space, indicating the control measure(s) for environmental factors, the means of control, and the degree to which control changes the environmental factor.

h. State compliance, or lack thereof, for each combination of space, representative occupant, and design comfort condition.

6.2.2 Section 5.3 Specific Documentation

a. State the relative humidity and average air speed V_a, including expected ranges, used in the comfort calculation for each combination of space, representative occupant, and design comfort condition.

b. Local thermal discomfort shall be addressed, at a minimum, by a narrative explanation of why an effect is not likely to exceed Section 5 limits. Where calculations are used to determine the effect of local thermal discomfort in accordance with Section 5, the calculation inputs, methods, and results shall be stated.

c. Where elevated air speed with occupant control is employed to provide satisfactory thermal conditions, documentation shall be provided to identify the method and equipment for occupant control.

6.2.3 Section 5.4 Specific Documentation

a. State compliance time period(s) for Section 5.4 applicability. (***Informative Note:*** This could be select months of the year or periods of outdoor thermal conditions when a mixed-mode system changes to natural ventilation mode).

b. State prevailing mean outdoor design temperature for each compliance time period and confirmation it is within the bounds of Section 5.4.
c. Confirm that no heating or cooling system is in operation during the compliance time period(s).
d. Confirm that representative occupant metabolic rates are within the bounds of Section 5.4.
e. Confirm that occupants are freely able to alter their clothing as required by Section 5.4.
f. State predicted operative temperature range during occupied hours for each compliance time period, considering the dynamic performance of the space, meteorological weather data, and the effects of direct solar radiation on mean radiant temperature.
g. State increased air speed adjustment to upper operative temperature limit based on Table 5-13, if applicable.

Informative Note: A sample compliance form can be downloaded at www.ashrae.org/xxxxx (requires Microsoft Excel®.

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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About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

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