



STANDARD

ANSI/ASHRAE Standard 55-2017
(Supersedes ANSI/ASHRAE Standard 55-2013)
Includes ANSI/ASHRAE addenda listed in Appendix N

Thermal Environmental Conditions for Human Occupancy

See Appendix N for approval dates.

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

ANSI/ASHRAE Standard 55-2017 is the latest edition of Standard 55. It incorporates seven addenda to the 2013 edition that were written with a renewed focus on application of the standard by practitioners and use of clear, enforceable language.

The core of the standard in Sections 4 and 5 specifies methods to determine thermal environmental conditions (temperature, humidity, air speed, and radiant effects) in buildings and other spaces that a significant proportion of the occupants will find acceptable at a certain metabolic rate and clothing level. The comprehensive analytical method to determine these conditions uses calculation algorithms included in the standard and appendices, all of which are implemented in the ASHRAE Thermal Comfort Tool.

The standard contains a graphical method of compliance, which is familiar to many users, yet is permitted to be used only in limited circumstances. Given the widespread and easy accessibility of computing power, along with third-party implementations of the analytical method, it is expected that more users will favor the comprehensive analytical methods over the graphical method.

Section 6 contains requirements for demonstrating that a design of an occupied space or building meets the comfort requirements in Sections 4 and 5. Section 7 includes requirements for the measurement and evaluation of existing thermal environments and is also applicable to commissioning.

Because the two personal characteristics of occupants (metabolic rate and clothing level) vary, operating set points for buildings are not mandated by this standard.

Standard 55 was first published in 1966 and republished in 1974, 1981, and 1992. Beginning in 2004, it is now updated using ASHRAE's continuous maintenance procedures. According to these procedures, Standard 55 is continuously revised by addenda that are publicly reviewed, approved by ASHRAE and ANSI, and published and posted for free on the ASHRAE website.

The seven addenda published since 2013 are summarized in detail in Informative Appendix N. The most noteworthy changes are as follows:

- a. Clarification of the three comfort calculation approaches in Section 5.3.3, "Elevated Air Speed," including a new applicability table and a reorganization of Section 5.3.3 to address an Elevated Air Speed Comfort Zone Method.
- b. Simplification of Normative Appendix A, "Methods for Determining Operative Temperature," to a single procedure for calculating operative temperature.
- c. Removal of permissive language found throughout the standard (excluding the title; Sections 1, 2, 3, and 7; and all Informative Appendices).

- d. Modification of Section 2, "Scope," to ensure the standard is not used to override any safety, health, or critical process requirements.
- e. Addition of a new requirement to calculate the change to thermal comfort resulting from direct solar radiation impacting occupants. A calculation procedure is added in new Normative Appendix C, "Procedure for Calculating Comfort Impact of Solar Gain on Occupants."

1. PURPOSE

The purpose of this standard is to specify the combinations of indoor thermal environmental factors and personal factors that will produce thermal environmental conditions acceptable to a majority of the occupants within the space.

2. SCOPE

2.1 The environmental factors addressed in this standard are temperature, thermal radiation, humidity, and air speed; the personal factors are those of activity and clothing.

2.2 It is intended that all of the criteria in this standard be applied together, as comfort in the indoor environment is complex and responds to the interaction of all of the factors that are addressed herein.

2.3 This standard specifies thermal environmental conditions acceptable for healthy adults at atmospheric pressure equivalent to altitudes up to 3000 m (10,000 ft) in indoor spaces designed for human occupancy for periods not less than 15 minutes.

2.4 This standard does not address such nonthermal environmental factors as air quality, acoustics, and illumination or other physical, chemical, or biological space contaminants that may affect comfort or health.

2.5 This standard shall not be used to override any safety, health, or critical process requirements.

3. DEFINITIONS

adaptive model: a model that relates indoor design temperatures or acceptable temperature ranges to outdoor meteorological or climatological parameters. **Informative Note:** Adaptive model is another name for the method described in Section 5.4, "Determining Acceptable Thermal Conditions in Occupant-Controlled Naturally Conditioned Spaces."

air speed: the rate of air movement at a point, without regard to direction.

air speed, average (V_a): the average air speed surrounding a representative occupant. The average is with respect to location and time. The spatial average is for three heights as defined for average air temperature t_a . The air speed is averaged over an interval not less than one and not more than three minutes. Variations that occur over a period greater than three minutes shall be treated as multiple different air speeds.

climate data: hourly, site-specific values of representative meteorological data, such as temperature, wind, speed, solar radiation, and relative humidity. For cities or urban regions with several climate data entries, and for locations where climate data are not available, the designer shall select available