



ADDENDA

**ANSI/ASHRAE Addendum b to
ANSI/ASHRAE Standard 55-2013**

Thermal Environmental Conditions for Human Occupancy

Approved by ASHRAE on November 18, 2014; and by the American National Standards Institute on December 1, 2014.

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ISSN 1041-2336



- a. These limits are shown by the light gray area in Figure 5.3.3A
- b. Section 5.3.4.3 has further requirements for operative temperatures (t_o) below 22.5°C (72.5°F) at particular levels of clo and met.

Exception: Above activity levels of 1.3 met, the limits in Section 5.3.3.2 do not apply when using the SET model and Figure 5.3.3A.

Modify Section 5.3.4.3 as shown below.

5.3.4.3 Draft. At operative temperatures (t_o) below 22.5°C (72.5°F), average air speed (V_a) caused by the building, its fenestration, and its HVAC system shall not exceed 0.20–0.15 m/s (40–30 fpm). This limit does not require consideration of air movement produced by office equipment or occupants.

Exceptions: Higher average air speeds (V_a) that are permitted by Section 5.3.3.

Modify Section 6.2 as shown below. The remainder of Section 6.2 is unchanged.

6.2 Documentation. The method and design conditions appropriate for the intended use of the building shall be selected and documented as follows.

Note: Some of the requirements in items (a) through (g) below may not be applicable to naturally conditioned buildings.

- a. The method of design compliance shall be stated for each space and/or system: Graphic Comfort Zone Method (Section 5.3.1), Analytical Comfort Zone Method (Section 5.3.2), Elevated Air Speed Comfort Zone Method (Section 5.3.3), or the use of Section 5.4 for Occupant-Controlled Naturally Conditioned Spaces.

[...]

Modify Section 7.2.2 as shown below.

7.2.2 Prediction of Comfort from Environmental Measurements

7.2.2.1 Mechanically Conditioned Spaces. Use Section 5.3.1.2 to determine the PMV-based comfort zone for the occupants' expected clothing and metabolic rate. The modeled clothing and activity levels of the occupants must be as observed or as expected for the use of the indoor space in question. Use Section 5.3.3 to adjust the comfort zone's lower and upper operative temperature limits boundaries for elevated air movement. Occupied zone conditions must also conform to requirements for avoiding local thermal discomfort (as specified in Section 5.3.4) and to limits to rate of temperature change over time, as specified in Section 5.3.5.

Parameters to be measured and/or recorded include the following:

- a. Occupant metabolic rate (met) and clothing (clo) observations
- b. Air temperature (t_a) and humidity

- c. Mean radiant temperature (\bar{t}_r), unless it can be otherwise demonstrated that, within the space, \bar{t}_r is within 1°C (2°F) of t_a
- d. Air speed, unless it can be otherwise demonstrated that, within the space, average air speed (V_a) meets the requirements of Section 5.3.3

7.2.2.2 Naturally Conditioned Spaces. Section 5.4 prescribes the use of the adaptive model for determining the comfort zone boundaries. The air movement extensions to the comfort zone's lower and upper operative temperature limits boundaries (Table 5.4.2.4 Figure 5.3.3B) shall be used when elevated air movement is present.

Parameters to be measured include the following:

- a. Indoor air temperature and mean radiant temperature
- b. Outdoor air temperature

Modify Informative Appendix F as shown below. The remainder of Informative Appendix F is unchanged.

INFORMATIVE APPENDIX F ANALYTICAL AND GRAPHIC COMFORT ZONE METHODS

F1. DETERMINING ACCEPTABLE THERMAL CONDITIONS IN OCCUPIED SPACES

[...]

F2. GRAPHICAL COMFORT ZONE METHOD

Use of this method is limited to representative occupants with metabolic rates between 1.0 and 1.3 met and clothing insulation between 0.5 and 1.0 clo in spaces with air speeds less than 0.2 m/s (40 fpm). Spaces with air distribution systems that are engineered such that HVAC-system-supplied air streams do not enter the occupied zone will seldom have averaged air speeds that exceed 0.2 m/s (40 fpm). See Chapter 21 of *ASHRAE Handbook—Fundamentals* for guidance on selecting air distribution systems.

Figure 5.3.1 in the Graphical Comfort Zone Method section shows the comfort zone for environments that meet the above criteria. Two zones are shown—one for 0.5 clo of clothing insulation and one for 1.0 clo of insulation. These insulation levels are typical of clothing worn when the outdoor environment is warm and cool, respectively.

Comfort zones for intermediate values of clothing insulation are determined by linear interpolation between the limits for 0.5 and 1.0 clo, using the relationships shown in this standard.

Elevated air speeds increase the lower and upper operative temperature (t_o) limit for the comfort zone if the criteria in the elevated air speed section Section 5.3.3 are met.

F3. ANALYTICAL COMFORT ZONE METHOD

[...]

F4. ELEVATED AIR SPEED COMFORT ZONE METHOD

