



ADDENDA

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

Thermal Environmental Conditions for Human Occupancy

Approved by ASHRAE on April 3, 2017; and by the American National Standards Institute on May 1, 2017.

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FOREWORD

This addendum simplifies Normative Appendix A, "Methods for Determining Operative Temperature," to be a single procedure for calculating operative temperature. Case 1 is removed because it is overly permissive, and Case 3 is removed because it is redundant with Case 2.

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

Addendum c to Standard 55-2013

Revise Normative Appendix A as follows.

(This is a normative appendix and is part of this standard.)

NORMATIVE APPENDIX A METHODS FOR DETERMINING OPERATIVE TEMPERATURE

Determine operative temperature (t_o) in accordance with one of using the following ~~eases~~method or Chapter 9 of *ASHRAE Handbook—Fundamentals*.³

Note: Average air speed and average air temperature have precise definitions in this standard. See Section 3 for all defined terms.

Case 1: Average air temperature (t_a) is permitted to be used in place of operative temperature (t_o) when these three conditions are met:

- There is no radiant and/or radiant panel heating or radiant panel cooling system.
- The area weighted average U-factor of the outside window/wall satisfies the following inequality:

$$U_w < \frac{50}{t_{d,i} - t_{d,e}} \quad (\text{SI})$$

$$U_w < \frac{15.8}{t_{d,i} - t_{d,e}} \quad (\text{IP})$$

where

U_w = average U-factor of window/wall,
W/m²·K (Btu/h·ft²·°F)

$t_{d,i}$ = internal design temperature, °C (°F)

$t_{d,e}$ = external design temperature, °C (°F)

- e. Window solar heat gain coefficients (SHGC) are less than 0.48.

Case 2: Calculation of the operative temperature (t_o) is based on average air temperature (t_a) and mean radiant temperature.

Operative temperature (t_o) is permitted to be calculated per the following formula:

$$t_o = At_a + (1 - A)\bar{t}_r$$

where

t_o = operative temperature

t_a = average air temperature

\bar{t}_r = mean radiant temperature (For detailed calculation procedures see the "Thermal Comfort" chapter of most current edition of *ASHRAE Handbook—Fundamentals*.³)

A can be selected from the following values as a function of the relative average air speed $v_r(V_a)$.

$v_r V_a$	<0.2 m/s (<40 fpm)	0.2 to 0.6 m/s (40 to 120 fpm)	0.6 to 1.0 m/s (120 to 200 fpm)
A	0.5	0.6	0.7

Case 3: For representative occupants with metabolic rates between 1.0 and 1.3 met, not in direct sunlight, when the average air speed (V_a) is <0.2 m/s (40 fpm) and where the difference between mean radiant temperature (\bar{t}_r) and average air temperature (t_a) is <4°C (7°F), the operative temperature (t_o) is permitted to be calculated as the mean of the average air temperature and mean radiant temperature.

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.

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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.

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