ADDENDA

ANSI/ASHRAE/IES Addendum bv to
ANSI/ASHRAE/IES Standard 90.1-2022

Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on April 30, 2025; and by the Illuminating Engineering Society on May 2, 2025.

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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 ISSN 1041-2336

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Approved American National Standard
ANSI
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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

Section 12, "Energy Cost Budget," includes equations to remove the fan power from the hypothetical baseline mechanical system. New efficiency metrics were introduced in the Section 6 mechanical equipment tables where SEER and HSPF values were updated to SEER2 and HSPF2 values.

These equations apply to baseline Systems 3, 4, 9, and 11 when the systems are under 65,000 Btu/h. The Department of Energy issued EERE–2014–BT–STD– 0048, which identifies the translation of SEER to SEER2 and HSPF to HSPF2 equivalency. The single-package AC and HP had a SEER of 14 with a new, SEER2 rating of 13.4. The single-package heat-pump HSPF of 8.0 changed to an HSPF2 of 6.7. Lacking further industry data, this proposal uses the ratio of the old-to-new metrics to update the Section 12 equations.

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 bv to Standard 90.1-2022

Modify Section 12.5 as shown (I-P and SI).

12.5 Calculation of Design Energy Cost and Energy Cost Budget

[. . .]

12.5.2 HVAC Systems.

[. . .]

c. **Supply Fan Energy in Certain Package Equipment.** Where *efficiency* ratings include supply fan *energy*, the *efficiency* rating shall be adjusted to remove the supply fan *energy*. For budget *system* Types 3, 4, 6, 8, 9, 10, and 11, calculate the minimum $COP_{nfcooling}$ and $COP_{nfheating}$ using the equation for the applicable performance rating as indicated in Tables 6.8.1-1, 6.8.1-2, 6.8.1-4, and 6.8.1-15. Where a full- and part-load *efficiency* rating is provided in Tables 6.8.1-1, 6.8.1-2, 6.8.1-4, and 6.8.1-15, the full-load equation below shall be used:

(I-P):

$$COP_{nfcooling} = 7.84E\text{-}8 \times EER \times Q + 0.338 \times EER$$

~~$COP_{nfcooling} = -0.0076 \times SEER^2 + 0.3796 \times SEER$~~

$COP_{nfcooling} = -0.0083 \times SEER2^2 + 0.3966 \times SEER2$

(applies to cooling *efficiency* only)

$$COP_{nfheating} = 1.48E\text{-}7 \times COP_{47} \times Q + 1.062 \times COP_{47}$$

(applies to Systems 6 and 9 heating *efficiency* only)

~~$COP_{nfheating} = -0.0296 \times HSPF^2 + 0.7134 \times HSPF$~~

$COP_{nfheating} = -0.0422 \times \text{HSPF2}^2 + 0.8518 \times \text{HSPF2}$

$$COP_{nfcooling} = 0.3322 \times EER - 0.2145$$

(applies to Systems 8 and 10 cooling *efficiency* only)

$$COP_{nfheating} = 1.1329 \times COP - 0.214$$

(applies to System 8 heating *efficiency* only)

(SI):

$$COP_{nfcooling} = 9.13E\text{-}4 \times COP_C \times Q + 1.15 \times COP_C$$

~~$COP_{nfcooling} = -0.0885 \times SCOP_C^2 + 1.295 \times SCOP_C$~~

$COP_{nfcooling} = -0.0963 \times SCOP2_C^2 + 1.351 \times SCOP2_C$

(applies to cooling efficiency only)

$$COP_{nfheating} = 5.05E\text{-}4 \times COP_{H8.3} \times Q + 1.062 \times COP_{H8.3}$$

(applies to Systems 6 and 9 heating efficiency only)

~~$COP_{nfheating} = -0.3446 \times SCOP_H^2 + 2.434 \times SCOP_H$~~

$\underline{COP_{nfheating} = -0.4912 \times SCOP2_H^2 + 2.906 \times SCOP2_H}$

$$COP_{nfcooling} = 1.1338 \times COP - 0.2145$$

(applies to Systems 8 and 10 cooling efficiency only)

$$COP_{nfheating} = 1.1329 \times COP - 0.214$$

(applies to System 8 heating efficiency only)

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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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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