ANSI/ASHRAE/ICC/USGBC/IES Addendum ad to
ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

A Compliance Option of the International Green Construction Code®

Approved by the ASHRAE Standards Committee on October 16, 2019; by the ASHRAE Board of Directors on November 1, 2019; by the International Code Council on October 10, 2019; by the U.S. Green Building Council and the Illuminating Engineering Society on November 5, 2019; and by the American National Standards Institute on November 4, 2019.

These addenda were 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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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 ad deletes the requirements specific to Standard 189.1 for SHGC multipliers for permanent projections, including Table 7.4.2.7. As a result, Standard 189.1 reverts to the table in Standard 90.1-2016, which is more up-to-date. With the deletion of Table 7.4.2.7, the definition for "north-oriented," which does not appear elsewhere in the standard, is also be deleted from Section 3.

Section 7.4.2.7 also allowed a relaxation of the SHGC requirements by 0.1 for north-oriented (within 45 degrees of due north) vertical fenestration for all climate zones. A series of EnergyPlus simulations found that this relaxation of SHGC resulted in increased energy costs except in Climate Zones 4C and 5 through 8 and only for glazing oriented within 22.5 degrees of true north. As a result, the criteria for the SHGC relaxation have been tightened accordingly.

This addendum also deletes the duct insulation Section 7.4.3.9. Standard 189.1 users must comply with the requirements of Standard 90.1-2016. The 2016 edition has revised duct insulation requirements that generally save more energy than the requirements in Standard 189.1.

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 ad to Standard 189.1-2017

Delete the Section 3 definition of "north-oriented."

~~***north-oriented:*** facing within 45 degrees of true north within the northern hemisphere (however, facing within 45 degrees of true south in the southern hemisphere).~~

Revise Section 7.4.2.7 as shown and Delete Table 7.4.2.7.

7.4.2.7 SHGC of North-Facing Vertical Fenestration. ~~For SHGC compliance, the methodology in ANSI/ASHRAE/IES Standard 90.1, Section 5.5.4.4.1, Exception 2, is allowed, provided that the SHGC multipliers in Table 7.4.2.7 of this standard are used. This requirement supersedes the requirement in ANSI/ ASHRAE/IES Standard 90.1, Table 5.5.4.4.1; that table shall not apply.~~ In Climate Zones 4C and 5 through 8, vertical ~~Vertical~~ fenestration that is oriented within 22.5 degrees of true north ~~oriented~~ in the Northern Hemisphere, or is oriented within 22.5 degrees of true south in the Southern Hemisphere, shall be allowed to have a maximum SHGC of 0.10 greater than that specified in ANSI/ASHRAE/IES Standard 90.1, Tables 5.5-1 through 5.5-8. When this provision is used, separate calculations shall be performed for these sections of the building envelope, and these values shall not be averaged with any others for compliance purposes.

Delete Section 7.4.3.9 and renumber subsequent sections.

~~**7.4.3.9 Duct Insulation.** Duct insulation shall comply with the minimum requirements in Normative Appendix A, Tables A-2 and A-3. These requirements supersede the requirements in ANSI/ASHRAE/IES Standard 90.1, Table 6.8.2.~~

~~**Table 7.4.2.7 SHGC Multipliers for Permanent Projections**~~

~~PF~~	~~SHGC Multiplier (All Other Orientations)~~	~~SHGC Multiplier (North-Oriented)~~
~~0 to 0.60~~	~~1.00~~	~~1.00~~
~~>0.60 to 0.70~~	~~0.92~~	~~0.96~~
~~>0.70 to 0.80~~	~~0.84~~	~~0.94~~
~~>0.80 to 0.90~~	~~0.77~~	~~0.93~~
~~>0.90 to 1.00~~	~~0.72~~	~~0.90~~

Delete Tables A-2 and A-3 (both I-P and SI; only I-P are shown here) in Normative Appendix A.

Table A-2 (Supersedes Table 6.8.2 in ANSI/ASHRAE/IES Standard 90.1)
Minimum Duct Insulation R-Value[a] Heating- and Cooling-Only Supply Ducts and Return Ducts (I-P)

	Duct Location						
Climate Zone	Exterior	Ventilated Attic	Unvented Attic above Insulated Ceiling	Unvented Attic with Roof Insulation[a]	Unconditioned Space[b]	Indirectly Conditioned Space[c]	Buried
Heating-Only Ducts							
0, 1, 2	None	None	None	None	None	None	None
3	R-6	None	None	None	R-6	None	None
4	R.6	None	None	None	R-6	None	None
5	R-8	R-6	None	None	R-6	None	R-6
6	R-8	R-8	R-6	None	R-6	None	R-6
7	R-10	R-8	R-8	None	R-6	None	R-6
8	R-10	R-10	R-8	None	R-8	None	R-8
Cooling-Only Ducts							
0, 1	R-6	R-8	R-10	R-6	R-6	None	R-6
2	R-6	R-8	R-10	R-6	R-6	None	R-6
3	R-6	R-8	R-8	R-6	R-3.5	None	None
4	R-3.5	R-6	R-8	R-3.5	R-3.5	None	None
5, 6	R-3.5	R-3.5	R-6	R-3.5	R-3.5	None	None
7, 8	R-1.9	R-3.5	R-3.5	R-3.5	R-3.5	None	None
Return Ducts							
0 to 8	R-6	R-6	R-6	None	None	None	None

a. Insulation R-values, measured in (h·ft2·°F)/Btu, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Where exterior *walls* are used as plenum *walls*, *wall* insulation shall be as required by the most restrictive condition of this table or Section 7.4.2. Insulation resistance is measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

b. Includes crawlspaces, both ventilated and nonventilated.

c. Includes return air plenums with or without exposed *roofs* above.

Table A-3 (Supersedes Table 6.8.2 in ANSI/ASHRAE/IES Standard 90.1)
Minimum Duct Insulation R-Value[a] Combined Heating and Cooling Supply Ducts and Return Ducts (I-P)

	Duct Location						
Climate Zone	Exterior	Ventilated Attic	Unvented Attic above Insulated Ceiling	Unvented Attic with Roof Insulation[a]	Unconditioned Space[b]	Indirectly Conditioned Space[c]	Buried
Supply Ducts							
0, 1	R-8	R-8	R-10	R-6	R-6	None	R-6
2	R-8	R-8	R-8	R-6	R-8	None	R-6
3	R-8	R-8	R-8	R-6	R-8	None	R-6
4	R-8	R-8	R-8	R-6	R-8	None	R-6
5	R-8	R-8	R-8	R-3.5	R-8	None	R-6
6	R-10	R-8	R-8	R-3.5	R-8	None	R-6
7	R-10	R-8	R-8	R-3.5	R-8	None	R-6
8	R-10	R11	R11	R-3.5	R-8	None	R-8
Return Ducts							
0 to 8	R-6	R-6	R-6	None	None	None	None

a. Insulation R-values, measured in (h·ft^2·°F)/Btu, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Where exterior *walls* are used as plenum *walls*, *wall* insulation shall be as required by the most restrictive condition of this table or Section 7.4.2. Insulation resistance is measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

b. Includes crawlspaces, both ventilated and non-ventilated.

c. Includes return air plenums with or without exposed *roofs* above.

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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Standard 189.1 and the International Green Construction Code

Standard 189.1 serves as the complete technical content of the International Green Construction Code® (IgCC). The IgCC creates a regulatory framework for new and existing buildings, establishing minimum green requirements for buildings and complementing voluntary rating systems. For more information, visit www.iccsafe.org.

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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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11/19