ANSI/ASHRAE/IESNA Addendum *r* to
ANSI/ASHRAE/IESNA Standard 90.1-2001

ASHRAE®
STANDARD

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on October 5, 2003; by the ASHRAE Board of Directors on January 29, 2004; and by the American National Standards Institute on February 25, 2004.

This standard is under continuous maintenance 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. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE web site, *http://www.ashrae.org*, or in paper form from the Manager of Standards. The latest edition of an ASHRAE Standard and printed copies of a public review draft may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: *orders@ashrae.org*. Fax: 404-321-5478. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in U.S. and Canada).

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ANSI

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SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (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 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,
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.)

FOREWORD

The minimum insulation requirements for return ducts in 90.1-2001 apply to all return ducts, whether the return duct is for a cooling only or heating only system or a combined heating and cooling duct system. Showing the return duct requirements only under Table 6.2.4.1.2A (formerly Table 6.2.4.2A) created some potential for confusion since that table is titled, "Cooling and Heating Only Supply Ducts and Return Ducts." This proposed addendum modifies Table 6.2.4.1.2B (formerly Table 6.2.4.2B) to make it clear that the return duct insulation requirements shown in Table 6.2.4.1.2A also apply to return ducts when combined heating and cooling supply ducts are used.

Addendum *r* to 90.1-2001 (I-P and SI editions)

Revise Table 6.2.4.1.2B (formerly Table 6.2.4.2B) in both the I-P and the SI editions of the standard as follows:

1. *Add insulation requirements for return ducts from Table 6.2.4.1.2A (formerly Table 6.2.4.2A) to the bottom of Table 6.2.4.1.2B (formerly Table 6.2.4.2B) (see attached revised Table 6.2.4.1.2B).*

2. *Insert the title for "Supply Ducts" to create balance and consistency with the addition for "Return Ducts" information.*

3. *Change the title of Table 6.2.4.1.2B (formerly Table 6.2.4.2B) to read as follows: "Minimum Duct Insulation R-Value,[a] Combined Heating and Cooling Supply Ducts and Return Ducts."*

See the I-P Version of Table 6.2.4.1.2B (formerly Table 6.2.4.2B) on the following page for the specific changes.

I-P Edition:

TABLE 6.2.4.1.2B

Minimum Duct Insulation R-Value,[a] Combined Heating and Cooling Supply Ducts and Return Ducts

Climate Zone			Duct Location						
Envelope Criteria Table	HDD65	CDD50	Exterior	Ventilated Attic	Unvented Attic Above Insulated Ceiling	Unvented Attic w/ Roof Insulation[a]	Uncondi-tioned Space[b]	Indirectly Condi-tioned Space[c]	Buried
Supply Ducts									
B-1	0-900	10801+	R-8	R-6	R-8	R-3.5	R-3.5	none	R-3.5
B-2	0-900	9001-10800	R-6	R-6	R-8	R-3.5	R-3.5	none	R-3.5
B-3	0-900	7201-9000	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-4	0-900	0-7200	R-6	R-3.5	R-6	R-3.5	R-1.9	none	R-3.5
B-5	901-1800	7201+	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-6	901-1800	5401-7200	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-7	901-1800	0-5400	R-3.5	R-3.5	R-6	R-1.9	R-1.9	none	R-1.9
B-8	1801-2700	5401+	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-9	1801-2700	0-5400	R-6	R-3.5	R-6	R-1.9	R-1.9	none	R-1.9
B-10	2701-3600	5401+	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-11	2701-3600	3601-5400	R-6	R-6	R-6	R-3.5	R-3.5	none	R-1.9
B-12	2701-3600	0-3600	R-3.5	R-3.5	R-3.5	R-1.9	R-1.9	none	R-1.9
B-13	3601-5400	3601+	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-14	3601-5400	1801-3600	R-6	R-3.5	R-6	R-1.9	R-3.5	none	R-1.9
B-15	3601-5400	0-1800	R-3.5	R-3.5	R-3.5	R-1.9	R-1.9	none	R-1.9
B-16	5401-7200	3601+	R-6	R-6	R-6	R-3.5	R-3.5	none	R-3.5
B-17	5401-7200	1801-3600	R-6	R-6	R-6	R-1.9	R-3.5	none	R-3.5
B-18	5401-7200	0-1800	R-6	R-3.5	R-3.5	R-1.9	R-3.5	none	R-3.5
B-19	7201-9000	1801+	R-8	R-6	R-6	R-1.9	R-3.5	none	R-3.5
B-20	7201-9000	0-1800	R-6	R-6	R-6	R-1.9	R-3.5	none	R-3.5
B-21	9001-10800	1801+	R-8	R-6	R-6	R-1.9	R-6	none	R-3.5
B-22	9001-10800	0-1800	R-8	R-6	R-6	R-1.9	R-3.5	none	R-3.5
B-23	10801-12600	all	R-8	R-6	R-6	R-1.9	R-6	none	R-6
B-24	12601-16200	all	R-8	R-8	R-8	R-1.9	R-6	none	R-6
B-25	16201-19800	all	R-10	R-8	R-8	R-3.5	R-6	none	R-6
B-26	19801+	all	R-10	R-10	R-8	R-3.5	R-8	R-3.5	R-6
Return Ducts									
B-1 to B-26	All climates		R-3.5	R-3.5	R-3.5	none	none	none	none

a Insulation R-values, measured in ($h \cdot ft^2 \cdot °F$)/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 6.2.4.2 or Section 5. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

b Includes crawl spaces, both ventilated and non-ventilated.

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

SI Edition:

TABLE 6.2.4.1.2B

Minimum Duct Insulation R-Value,[a] Combined Heating and Cooling Supply Ducts and Return Ducts

Climate Zone			Duct Location						
Envelope Criteria Table	HDD65	CDD50	Exterior	Ventilated Attic	Unvented Attic Above Insulated Ceiling	Unvented Attic w/ Roof Insulation[a]	Unconditioned Space[b]	Indirectly Conditioned Space[c]	Buried
Supply Ducts									
Return Ducts									
B-1 to B-26	All climates		R-0.62	R-0.62	R-0.62	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 6.2.4.2 or Section 5. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

b Includes crawl spaces, both ventilated and non-ventilated.

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

All other information in Table 6.2.4.1.2B remains the same.

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.