

ANSI/ASHRAE Standard 90.2-2007
(Supersedes ANSI/ASHRAE Standard 90.2-2004)
Includes ANSI/ASHRAE addenda listed in Appendix C



ASHRAE STANDARD

Energy-Efficient Design of Low-Rise Residential Buildings

See Appendix C for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

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 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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ISSN 1041-2336



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and Air-Conditioning Engineers, Inc.**

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www.ashrae.org

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NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at <http://www.ashrae.org>.

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(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

The original Standard 90.2 was published in 1993, and revised editions were published in 2001 and 2004. The ASHRAE Board of Directors voted in 1999 to place ASHRAE standards on continuous maintenance, permitting the standard to be updated several times each year through the publication of approved addenda to the standard. Starting with the 2001 edition, the standard is now published in its entirety every third year. This schedule was intended to allow the standard to be submitted and proposed by the deadline for inclusion or

reference in model building and energy codes. All approved addenda and errata will be included in the new edition every three years. This procedure allows users to have some certainty about when new editions will be published.

*This 2007 edition of the standard has several new features, which can be viewed in brief in Appendix C of this document or online at www.ashrae.org. The committee welcomes suggestions for improving the standard. Users of the standard are encouraged and invited to use the continuous maintenance procedure to suggest changes. A form, *Submittal of Proposed Change*, is included at the back of this standard. The committee will take formal action on every proposal received.*

The Standing Standards Project Committee is continually considering changes and proposing addenda for public review. When addenda are approved, notices will be published on the ASHRAE Web site. Users are encouraged to sign up for the free ASHRAE Internet Listserv for this standard to receive notice of all public review drafts and published addenda and errata.

1. PURPOSE

The purpose of this standard is to provide minimum requirements for the energy-efficient design of residential buildings.

2. SCOPE

2.1 This standard provides minimum energy-efficiency requirements for the design and construction of

- a. new residential dwelling units and their systems and
- b. where explicitly specified,
 1. new portions of residential dwelling units and their systems and
 2. new systems and equipment in existing dwelling units.

Note: There are no requirements in this standard that apply to new portions of residential dwelling units and their systems, nor to new systems and equipment in existing dwelling units.

For the purposes of this standard, “residential dwelling units” include single-family houses, multi-family structures (of three stories or fewer above grade), and modular houses. This standard does not include “transient” housing, such as hotels, motels, nursing homes, jails, and barracks, or manufactured housing.

2.2 This standard applies to the building envelope, heating equipment and systems, air-conditioning equipment and systems, domestic water-heating equipment and systems, and provisions for overall building design alternatives and trade-offs.

2.3 This standard does not apply to

- a. specific procedures for the operation, maintenance, and use of residential buildings;
- b. portable products such as appliances and heaters; and
- c. residential electric service or lighting requirements.

2.4 This standard shall not be used to abridge any safety, health, or environmental requirements.

3. DEFINITIONS, ABBREVIATIONS, ACRONYMS, AND SYMBOLS

3.1 Purpose. The purpose of this section is to define all terms, abbreviations, acronyms, and symbols unique to this standard.

3.2 Scope. These terms, abbreviations, acronyms, and symbols are applicable to all sections of this standard. Definitions as contained in *ASHRAE Terminology of Heating, Ventilation, Air Conditioning, & Refrigeration* shall apply to all terms in this standard unless specifically listed here.

3.3 Definitions

air films: interior and exterior air surface film coefficients for winter design conditions.

area of all ceiling assemblies: interior surface area of such assemblies that enclose conditioned space.

area of all door assemblies: opaque area of such assemblies (including the frame) that enclose conditioned space. For doors where the daylight opening area is greater than or equal to 50% of the door area, the entire area of the door assembly is considered fenestration area.

area of all exterior walls (gross): exterior surface area of the following assemblies that enclose conditioned space: opaque wall assemblies, including between-floor spandrels and peripheral edges of flooring; fenestration assemblies, including all glazed surfaces and sash and framing elements; and door assemblies. Areas of vents, grilles, and pipes are excluded.

area of all fenestration assemblies: interior surface area of such assemblies including all glazed surfaces (such as windows, skylights, and sliding glass doors), sashes, curbing, or framing elements that enclose conditioned space. For doors where the daylight opening area is less than 50% of the door area, the fenestration area is the daylight opening area. For all other doors, the fenestration area is the door area.

area of all floor assemblies: interior surface area of such assemblies that enclose conditioned space.

area of all opaque wall assemblies: gross area of exterior walls measured on the exterior consisting of all opaque wall areas (including foundation walls, between-floor spandrels, peripheral edges of floors, etc.) that enclose conditioned space (including interstitial areas).

assembly: portion of an envelope component represented by an arrangement and connection of building construction materials with a specific thermal transmittance or thermal conductance.

conditioned space: an enclosed space within a building that is provided with mechanical heating and/or cooling energy.

envelope component: major section of the entire envelope, such as the opaque walls above grade, ceilings, slabs, floors, glazings, doors, or walls below grade.

fenestration: all light-transmitting assemblies in a building envelope, including the glazing material, sash, frame, and permanently affixed external or internal shading devices, where such component assemblies enclose conditioned space.

heat trap: a device or arrangement of the piping entering and leaving a water heater, constructed to counteract the convective forces of the heated water (thermosyphoning) during standby periods.

heated slab: concrete slab-on-grade floor containing wires, cables, pipes, or ducts that transfers heat to the conditioned space.

living unit: one or more rooms designed or used as living quarters providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.