ADDENDA

ANSI/ASHRAE Addenda a and b to
ANSI/ASHRAE Standard 105-2007

Standard Methods of Measuring, Expressing and Comparing Building Energy Performance

Approved by the ASHRAE Standards Committee on January 21, 2012; by the ASHRAE Board of Directors on January 25, 2012; and by the American National Standards Institute on January 26, 2012.

This addendum was approved by a Standard Project Committee (SPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions. This standard is updated on a five-year cycle; the date following the standard number is the year of the ASHRAE Board of Directors approval.

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FOREWORD

This addendum to ASHRAE Standard 105-2007 revises the definition of "Gross Floor Area" of a building. The definition chosen reflects a general agreement among a number of interested ASHRAE parties and the Standard Project Committee 105 for what will be referenced within a number of ASHRAE standards. This definition is for use in energy analysis work and does not necessarily reflect the exact definition used by other organizations.

During development, there was significant discussion concerning if and how to include parking garages. Although there are a number of enclosed and even semiheated parking garages, the decision was that permitting parking garage area to be included in the calculation of building floor area would skew the reporting of building energy use intensity when presented in terms of energy use per square foot of floor area. Alternatives for incorporating parking garage energy into the relevant equations are being examined by the committee.

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 a to Standard 105-2007

[Revise the following definition in Section 3:]

3. DEFINITIONS

gross floor area: ~~the sum of the floor areas of the spaces within the building, including basements, mezzanine and intermediate-floored tiers, and penthouses with headroom height of 7.50 ft (2.28 m) or greater. It is measured from the exterior faces of exterior walls or from the centerline of walls separating buildings but excludes covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.~~ the sum of the floor areas of all the spaces within the building with no deductions for floor penetrations other than atria. It is measured from the exterior faces of exterior walls or from the centerline of walls separating buildings but it excludes covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, roof overhangs, parking garages, surface parking, and similar features.

(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

This addendum to ASHRAE Standard 105-2007 modifies the existing document from informative to mandatory language. A minimum of changes are being proposed to bring Standard 105-2007 into agreement with the current ASHRAE practice for standards. A more complete revision of this material will be incorporated in the full revision of Standard 105-2007 currently being developed by Standard Project Committee 105.

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 b to Standard 105-2007

[Revise Section 4 as follows.]

4. COMPLIANCE REQUIREMENTS

~~Compliance with this standard requires compliance with Section 5 as a minimum. Compliance with the requirements of Sections 6 and 7 is optional unless compliance with these sections is reported. Table 4.1 shows the different possible levels of compliance and the requirements for each level. Note that the higher levels of compliance require compliance with all levels below the higher level.~~

This standard has multiple and increasing levels of compliance:

- At a minimum, basic measurement and the expression of energy performance shall be in accordance with Section 5.
- Where additional expressions of building energy performance are desired, they shall be in accordance with Section 6.
- Where a building's energy performance is to be compared to other building performance or energy targets it shall be in accordance with Section 7.
- Table 4.1 shall be used to identify the required forms in this Standard.

TABLE 4.1 ~~Possible~~ Levels of Compliance with Standard 105

Level of Compliance	Requirements for Compliance
Basic Measurement and Expression of Energy Performance (Section 5 only)	• Forms 1 and 2 ~~are~~ shall be completed according to the requirements of Section 5.
Additional Expressions of Energy Performance (Sections 5 and 6)	• Forms 1 and 2 ~~are~~ shall be completed according to the requirements of Section 5. • The requirements of Section 6 ~~are~~ shall be met, including the completion of Form 3.
Comparison of Energy Performance (Sections 5, 6, and 7)	• Forms 1 and 2 ~~are~~ shall be completed according to the requirements of Section 5. • The requirements of Section 6 ~~are~~ shall be met, including the completion of Form 3. • The requirements of Section 7 ~~are~~ shall be met, including the completion of Form 4. • For documented methods, the analysis report and comparison database used to develop the comparison method are publicly available at no cost to the requester

[Revise Section 5 as follows. Only sections with changes are shown; remaining sections are unchanged.]

5. BASIC MEASUREMENT AND EXPRESSION OF ENERGY PERFORMANCE

[…]

5.2 Basic Building Characteristics. The following basic characteristics ~~must~~ shall be reported on Form 1.

5.2.1 A building identifier and address, including city, state, country, and zip (mail) code, ~~must~~ shall be reported on Form 1.

5.2.2 The start and end dates of the data measurement period ~~must~~ shall be reported on Form 1.

5.2.3 ***Gross floor area.*** The total floor area of the building or building space in square feet (square meters) ~~must~~ shall be reported on Form 1 as *gross floor area* (see Section 3 for definition).

5.2.4 The number of conditioned floors, with subtotals of above-grade and below-grade floors, ~~must~~ shall be reported on Form 1.

5.2.5 The primary year of construction ~~must~~ shall be reported on Form 1. ~~A secondary year of construction to indicate major additions that are less than 50% of total floor area~~

~~may also be reported~~ Additions of less than 50% of the total floor area shall be reported as a secondary year of construction.

5.2.6 The basic building type shall be indicated on Form 1, showing the percentage of the gross floor area that is allocated to the various building sub-types or sub-areas shown for the building type. The total of all the percentage values ~~must~~ shall be greater than 94%. Common spaces, circulation spaces, and other support spaces ~~should~~ shall be allocated to the type space they serve.

[…]

5.3.1.1 ~~Potential estimation methods can be examined in *ASHRAE Guideline 14-2002, Measurement of Energy and Demand Savings* (see Appendix E, Informative Bibliography). Suggested methods for estimation include:~~ Where energy data are estimated, they shall be estimated in accordance with the following:

a. Extrapolate short-term or spot measurements to cover the full operating schedule.
b. Use deliveries minus energy management system time history of consumption.
c. Use deliveries and read gauge (oil or propane).
d. Use deliveries and stick tank (oil).
e. Use deliveries and subtract carloads (coal or wood).
f. Use deliveries and estimate size of pile (coal or wood).

5.3.1.2 ~~Simulations should~~ Energy Simulations shall only be used ~~for~~ to estimate the energy performance of proposed buildings.

5.3.2 Record the amount of each type of energy used in the 12-month (365-day) period in column 3 and the units of energy in column 4 of Form 2. Each record of energy used ~~should~~ shall be adjusted to the same 365 day period.

5.3.2.1 Non-Stored Purchased Energy. The amounts of each form of energy purchased through a commercial financial transaction ~~can~~ shall be permitted to be measured using the same meter that was used for the financial transaction. If there is not a meter in place, then a commercially acceptable energy meter ~~should~~ shall be installed to measure energy consumption. If there are energy loads on the meter that are outside the boundary of the building or building space under consideration, then this external energy use ~~should~~ shall be measured by a separate meter or estimated and subtracted from the energy total on the main meter. All energy amounts ~~should~~ shall be recorded in the units reported on the energy bill or measured by the installed meter.

[…]

5.3.2.3 On-Site Renewable Energy Production. Buildings and structures utilizing non-purchased energy produced on-site, such as solar photovoltaic, active solar thermal, wind, hydro and geothermal energy, shall measure the energy delivered to the building through the use of Btu or kWh meters. Energy collected and utilized by passive means such as solar thermal or natural ventilation ~~should~~ shall not be included. Energy collected and utilized from the environment through air, water, or ground-source heat pump systems ~~should also~~ shall not be reported.

[…]

5.4.2 Heating value conversion factors for fuels shall be obtained from the utility bills or fuel supplier. Heating values of fuel gasses reported on utility bills are typically adjusted for delivered heat content, elevation, and temperature, so additional corrections are usually not needed. If fuel heat content values are not available, users will have to obtain the best available factors. Acceptable values for some fuels are given in Table 5.1. When fuel heat content values are not available, the default values in Table 5.1 shall be used and the use of such default values noted on Form 2. When using values listed in Table 5.1 for gases when the building location has an elevation above 2000 ft (610 m), the heating value ~~should~~ shall be adjusted for elevation. Appendix C provides informative elevation adjustment calculations. ~~Users should be cautioned that volumetric flow deliveries of liquid fuels are subject to need for temperature correction, but fuel suppliers may not make such corrections.~~ Where liquid fuel providers do not make temperature corrections, that shall be noted on Form 2. ~~Verification of volumes of liquid fuels delivered is complicated by many factors and, for purposes of this standard, is not required. The values in Table 5.1 for liquid fuels are for a temperature of 60°F (15.6°C). For more information on volume correction for liquid petroleum fuels, users can consult the *Manual of Petroleum Measurement Standards* (API 2004, Chapter 11) for extensive information (see Informative Appendix D, Bibliography).~~

5.5 Energy Costs. The total cost for each energy form used shall be reported in column 7 of Form 2. Monetary compensation for energy exported (sold) from the facility ~~should~~ shall be recorded as a negative number.

[…]

[Revise Section 6 as follows. Only sections with changes are shown; remaining sections are unchanged.]

6. ADDITIONAL EXPRESSIONS OF BUILDING ENERGY PERFORMANCE

6.1 This section establishes the requirements for specifying and expressing additional energy performance indices or factors of a building.

6.1.1 ~~Additional~~ When additional expressions of energy performance, such as pounds (kilograms) of annual air emissions per square foot (square meter) of floor area, are reported, they shall be reported in accordance with this Standard. ~~are optional under this standard unless such expressions are reported. Information on air emissions can be found in Deru and Torcellini (see Informative Appendix D, Bibliography). Although reporting of additional expressions of energy performance is optional, users of the standard may wish to make specific expressions of energy performance requirements for their own use.~~

6.2 Additional expressions of energy performance ~~must~~ shall comply with this section to comply with this standard.

6.2.1 Expressions of energy performance that do not use indices, such as a fixed energy use adjustment to total energy use, ~~should still~~ shall use Form 3 to specify and report the results~~, although additional notes may be needed to clarify the results~~. Additional notes shall be provided as necessary to clarify the results.

[…]

6.4.2 For each factor to be used, the units of the factor shall be specified on Form 3 if the factor has units. ~~Notes on the factor may also be provided.~~

6.5 Recommended Factors. All of the factors shown on Form 3 that apply to the building ~~are recommended to~~ shall be reported by users of this standard, indicating those not applicable as "N/A." Factors that are time dependent, such as degree-days, ~~should~~ shall be determined for the same 12-month period as used in Section 5.6.

[…]

[Revise Section 7 as follows. Only sections with changes are shown; remaining sections are unchanged.]

7. COMPARISON OF BUILDING ENERGY PERFORMANCE

[…]

~~**7.1.2** Comparing building energy performance is optional under this standard unless such comparisons are reported, although users of the standard may wish to make specific comparisons of energy performance requirements for their own use.~~

7.2 Each method of comparing energy performance beyond the energy and cost indices of Section 7.1.1 ~~must~~ shall conform to the requirements of this section to comply with this standard.

[…]

7.6.1.1 For a comparison to be of the documented type, the following must be publicly available, where *publicly available* is defined as being available in some form at no cost to the requester. The public access process ~~must~~ shall be reported on Form 4. In addition, the documentation shall include the following information:

- a report describing the analytical methods used to develop the performance comparison method and the results of the analysis, including the mean, maximum, and minimum values of the data set for any normalization parameters developed, any model coefficients for normalization models developed, and any data screening limits imposed on the data set used; and
- all data used in development of the analytical comparison method.

[…]

7.6.2 Time Period. The time period category ~~is~~ shall be either "annual" or "other." This category shall be marked on Form 4 for each comparison. For the category of "other," a brief specification of the nature of the time period ~~should~~ shall be given.

7.6.3 Comparison Data Set. All comparison factors used in an energy performance comparison framework method ~~must~~ shall be specified by descriptive names on Form 4.

[…]

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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