

**Version Tracking Document for
ENERGY STAR Qualified Homes, Version 3 (Rev. 01)
10/18/2010**

In the time since the original version 3 of the ENERGY STAR New Homes guidelines was released, EPA has modified, clarified and refined various aspects of the program documents, primarily in response to partner questions and comments. This document is a summary of these edits, organized by the program document containing the change. EPA has also posted the revised program documents, labeled version 3 (Rev. 01), on its Web site at www.energystar.gov/homes.

All changes are categorized as a Change, Clarification, or Refinement. These are defined as follows:

Change – The addition, deletion, or modification of a program requirement. A change will typically result from a partner question or feedback indicating that EPA's original intent is not being met; a change in EPA's intent is required; or due to changes in relevant standards (e.g., ENERGY STAR labeled product requirements, NAECA standards, IECC codes). A change is the most significant type of edit for partners because it is likely to change the way that partners comply with the program.

Clarification – The clarification of a program requirement, typically resulting from a partner question indicating confusion or ambiguity. Clarifications are not intended to significantly change the scope of the program guidelines, but rather to clarify the original intent of the requirement. A clarification is secondary in importance to a change; it should not significantly alter the way that most partners comply with the program.

Refinement – A minor change, such as an improved choice of words, a grammatical correction, or a correction to a typographical error. A refinement is the least important type of edit; it should have no impact on the way that partners comply with the program.

National Program Requirements

Refinement – ENERGY STAR Performance Path

Item 2 under the ENERGY STAR Performance Path has been modified to note that items 1.2 and 2.1 of the Thermal Enclosure System Rater Checklist contain the requirement that all insulation, windows, doors, and skylights shall meet or exceed 2009 IECC requirements, not the National Program Requirements.

Refinement – Exhibit 1

The footnote in the last bullet of the Envelope, Windows, and Doors section, which relates to required adjustments for U-values and SHGCs, has been updated to correctly reference footnote 13. In the prior version of the guidelines, the document incorrectly referenced footnote 15.

Refinement – Footnote 5

This footnote has been updated to apply to both the prescriptive and performance paths. 2009 IECC insulation levels were previously noted as being required in the prescriptive path, but apply to both the prescriptive and performance paths.

Clarification – Footnote 5

This footnote has been updated to explicitly note that slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade as noted in section 402.2.8 of the 2009 IECC.

Inspection Checklist – Cover Sheet

Change – Signature Block

Two checkboxes have been added, requiring that the Rater verify that the HVAC contractor holds the credentials necessary to complete the HVAC System Quality Installation Contractor checklist and that the builder is an ENERGY STAR partner.

Inspection Checklist - Thermal Enclosure System Rater Checklist

Refinement – Entire Checklist

The columns titled 'Builder Approved' and 'Rater Approved' have been reworded to 'Builder Verified' and 'Rater Verified'.

Clarification - Item 4.1

This item has been reworded to clarify that high-density insulation products can also be used to meet the intent of this requirement, rather than just raised-heel trusses or alternate framing techniques.

Clarification - Item 4.4

This item has been added to make explicit the requirement that for all homes with a slab in Climate Zones 4 and higher, 100% of the slab edge must be insulated. While this requirement was intended to be encompassed by item 2.2 of this checklist, there was concern that this intent was not sufficiently clear.

Clarification - Item 5.3.3

This item has been edited to clarify that whole-house fans must be equipped with an $\geq R-10$ insulated cover that is both gasketed AND either 1) installed on the house side; or 2) mechanically operated. That is to say, gasketing of the whole-house fan cover is a requirement in both cases.

Clarification – Footnote 3

This footnote has been updated to explicitly note that fenestration used in passive solar design is exempt from the U-value and SHGC requirements noted under the performance path. This same exemption has already been provided in the prescriptive path.

Clarification – Footnote 4

This footnote has been updated to explicitly note that slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade as noted in section 402.2.8 of the 2009 IECC.

Clarification – Footnote 5

This footnote was clarified to exclude all materials that are easily torn from being used as flexible air barriers and not just kraft paper and paper-based products.

Clarification – Footnote 8

This footnote was expanded to provide an explicit exemption to the raised-heel truss requirement for homes in which the ceiling insulation is installed in contact with the roof sheathing (i.e., cathedralized ceiling) and extends at full rated R-value down to the top plate. In practice this is not a change because insulation that achieves the full rated R-value at the top plate already meets EPA's intent. This footnote has also been reworded to clarify that high-density insulation products can also be used to meet the intent of this requirement, rather than just raised-heel trusses or alternate framing techniques. Finally, the phrase "achieves at least 75% of full insulation level" has been replaced with "achieves at least 75% of full insulation R-value" to clarify the intent of this requirement.

Change – Footnote 9

This footnote was revised to add ASTM C 1363 as an acceptable method for determining the effective R-value of insulated siding products.

HVAC System Quality Installation Contractor Checklist

Refinement – Entire Checklist

Three columns titled 'Contractor Verified', 'Rater Verified', and 'N/A' have been added to the right-hand side of the checklist to ease the verification and documentation process.

Clarification - Item 1.2

Item 1.2 has been edited to clarify the requirements for ventilation systems with intake ducts on the return side of the HVAC system. The revised language requires that the ventilation system not utilize an intake duct to the return side of the HVAC system unless the system is designed to operate intermittently and automatically based on a timer and to restrict outdoor air intake when not in use (e.g., motorized damper).

Refinement – Heading for Section 2

The heading for section 2 has been rewritten in sentence form to highlight key parameters that the HVAC Contractor/Designer shall include in their load calculations.

Change – Items 2.5 through 2.11

Items 2.5 through 2.11 have been added to the checklist so that additional key inputs for Manual J calculations can be documented by the HVAC contractor and/or designer and later verified by the Rater using the HVAC System Quality Installation Rater checklist. These additional parameters include:

- 2.5 - Orientation of the rated home
- 2.6 - Number of bedrooms in the rated home
- 2.7 - Conditioned floor area of the rated home
- 2.8 - Window area in the rated home
- 2.9 - Predominant window SHGC in rated home
- 2.10 - Infiltration rate in the rated home
- 2.11 - Mechanical ventilation rate in the rated home

Refinement – Items 2.12 through 2.18

Items 2.12 through 2.18 have been renumbered, relative to the original v3 documents, to accommodate the new items 2.5 through 2.11. Also, the Design Sensible Heat Ratio (SHR) (formerly item 2.8) has been removed. This item can be calculated using two other parameters on the checklist and therefore the SHR does not need to be explicitly documented.

Refinement – Items 3.3 and 3.4

For items 3.3 and 3.4, the words “fan coil” have been removed.

Refinement – Item 3.8

The refrigerant type R-22 has been removed because it is generally not applicable to new HVAC installations. For instances where R-22 is being used, the partner may use the “Other” field to document this refrigerant type.

Refinement – Item 3.9

The fan speed type option “PSC” has been changed to “Fixed” to improve clarity.

Refinement – Items 3.10 through 3.12

The word “Selected” has been changed to “Listed System” for clarity.

Refinement – Original Version 3 Items 3.13 and 3.14

The “Selected Sensible Heat Ratio” and “Selected SHR < Design SHR” fields, which were formerly items 3.13 and 3.14 in the original version 3 checklist, have been removed and these fields have been integrated into item 3.13 on the Revision 01 checklist. Also, items 3.14 and 3.15 on the Revision 01 checklist have been renumbered to account for these changes

Refinement – Item 5.4

The phrase “Selected Gross Capacity” has been changed to “Listed Output Heating Capacity” for clarity.

Refinement – Item 5.5

The phrase “Gross Capacity” has been changed to “Listed Output Heating Capacity” for clarity.

Refinement – Section 7

For clarity, items 7.1 through 7.9 have been reorganized into two subsections; one for systems with thermal expansion valves and one for systems with a fixed orifice.

Refinement – Item 9.5

The list of measurement methods has been refined to only include those most likely to be used when qualifying a home. Partners using other methods can continue to document their alternate methodology in the “Other” field.

Clarification – Item 10.2

This item was added to explicitly require that the HVAC contractor/designer attach a copy of their balancing report indicating the quantity of supply and return terminals per room. This requirement was implicit in the prior version of the guidelines because the rater will need this report to properly complete the HVAC System Quality Installation Rater checklist.

Refinement – Footnote 1

This footnote was updated to include geothermal heatpumps as an example of air-source/water-source heatpumps. In addition, several small changes in word choice were made due to space constraints.

Clarification – Footnote 1

This footnote was also expanded to clarify that the Rater may verify any item on the HVAC System Quality Installation Checklist in place of the contractor at the discretion of both the Rater and the contractor. When this occurs, the Rater shall check the box of the verified items in the Rater Verified column.

Refinement – Footnote 4

The reference to the ASHRAE Handbook of Fundamentals in the “Heating Systems” section has been updated from ASHRAE 2005 Handbook of Fundamentals to ASHRAE 2009 Handbook of Fundamentals as it is the most recent edition.

Change – Footnote 6

This footnote has been added to provide a definition of “predominant” as it relates to the new checklist item 2.9.

Change – Footnote 7

This footnote has been added to provide guidance on properly accounting for infiltration in the load calculations completed by the HVAC contractor/designer. The infiltration rate shall reflect the value used in the confirmed or projected HERS rating for the rated home. Alternatively, partners may use “Average” or “Semi-loose” values for the cooling season infiltration rates and “Semi-tight” or “Average” values for the heating season infiltration rates, as defined by ACCA Manual J, Eighth Edition, Version Two. The recommended default value in the original version 3 of the guidelines was “Tight” and has been changed because in the latest version of ACCA Manual J the infiltration rate associated with this descriptor is lower than what is found in typical qualified homes.

Clarification – Footnote 8

This footnote was added to reinforce that the design duct static pressure shall account for the installation of a MERV 6 or better filter.

Clarification – Footnote 11

This footnote was added to clarify that the listed system capacity at design conditions is to be obtained from the OEM expanded performance data.

Clarification & Change – Footnote 13

This footnote was added to provide examples of return or supply static pressure measurement locations, including the plenum, cabinet, and trunk duct, as well as specifying front, back, left or right side. It was also noted that test hole locations must be well marked and accessible so that raters can complete their duct pressure test in a non-destructive manner.

Change – Footnote 15

This footnote has been changed to indicate that drain pans may be made of galvanized steel, rather than stainless steel. Plastic may also still be used. In addition, the installation requirements for the drain pan have been simplified, as follows: drain pan shall drain condensate to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drainage system; and shall be equipped with a backflow prevention valve when drained to a shared drainage system, such as a storm water management system.

Refinement – Footnote 16

This footnote has been moved from the signature block of this checklist due to space constraints.

HVAC System Quality Installation Rater Checklist

Refinement – Entire Checklist

The column titled ‘Rater Approved’ has been reworded to ‘Rater Verified’.

Change – Item 1.2

Items 1.2.1 through 1.2.12 have been added to increase oversight by the Rater of the design parameters used by the HVAC contractor/designer. The Rater must review the following parameters related to system cooling design, selection, and installation from the HVAC Contractor checklist (the contractor checklist item # is indicated in parenthesis):

- 1.2.1 - Outdoor design temperatures (2.4) are equal to the 1% and 99% ACCA Manual J design temperatures for design location, or alternate temps supported with documentation.
- 1.2.2 - Home orientation (2.5) matches orientation of rated home
- 1.2.3 - Number of bedrooms (2.6) equals number of bedrooms in rated home
- 1.2.4 - Conditioned floor area (2.7) is within 10% of conditioned floor area of rated home
- 1.2.5 - Window area (2.8) is within 10% of calculated window area of rated home
- 1.2.6 - Predominant window SHGC (2.9) is within 0.1 of predominant value in rated home
- 1.2.7 - Listed latent cooling capacity (3.10) exceeds design latent heat gain (2.12)
- 1.2.8 - Listed sensible cooling capacity (3.11) exceeds design sensible heat gain (2.13)
- 1.2.9 - Listed total cooling capacity (3.12) is 95-115% (or 95-125% for Heat Pumps in Climate Zones 4-8) of design total heat gain (2.14), or next nominal size
- 1.2.10 - HVAC manufacturer and model numbers on installed equipment, contractor checklist (3.1, 3.3, 5.1), and AHRI certificate or OEM catalog data all match
- 1.2.11 - Using reported liquid line (6.3) or suction line (6.5) pressure, corresponding temp. (as determined using pressure/temperature chart for refrigerant type) matches reported condenser (7.1) or evaporator (7.5) saturation temperature (+/- 3 degrees)
- 1.2.12 - Calculated subcooling (7.1 minus 6.4) or superheat (6.6 minus 7.5) value equals reported target subcooling (7.3) or superheat (7.7) temperature.

Change – Item 1.3

Item 1.3 has also been added to increase oversight by the rater of the HVAC contractor design. It requires that the rater verify that the supply and return static pressures are <110% of the contractor-reported values.

Change – Item 2.7

This item has been added to require that the rater verify that the quantity and location of supply and return duct terminals match the contractor-provided balancing report.

Change – Item 6.1 through 6.3

These items have been added to help ensure that the HVAC system is operating properly. They require that:

- 6.1 - Air flow is produced when central HVAC fan is energized (set thermostat to “fan”).
- 6.2 - Cool air flow is produced when the cooling cycle is energized (set thermostat to “cool”).
- 6.3 - Heated air flow is produced when the heating cycle is energized (set thermostat to “heat”).

Refinement – Items 6.4 and 6.5

These items, which were formerly items 6.1 and 6.2 in the original version 3 checklist, have been renumbered to accommodate the addition of items 6.1 through 6.3.

Refinement – Item 8.5

The type of dryers exempted from direct venting to the outdoors has been reworded from “electric condensing dryers” to “ventless dryers” to align with the most up-to-date terminology.

Change – Footnote 3

This footnote has been added to provide a definition of “predominant” as it relates to the new checklist item 1.2.6.

Refinement – Footnote 10

Several small changes in word choice were made due to space constraints.

Water Management System Builder Checklist

Refinement – Entire Checklist

The second column header has been revised from “Builder Approved” to “Builder Verified”.

Change – Item 2.2

A requirement has been added to provide an additional bond-break drainage plane layer behind all stucco and stone veneer wall assemblies. While this is likely already done for most homes with these types of assemblies, this detail has been explicitly added to help ensure proper drainage.

Change – Footnote 5

Footnote 5 has been edited to include what was formerly footnote 6 in the original version 3 checklist. Furthermore, the exemption stating that polyethylene sheeting is not required in Marine climates if no air handler or return ducts are installed in the crawlspace has been removed. This language was inadvertently included from EPA’s Indoor airPLUS program, where this exemption does not apply to polyethylene sheeting, but rather to whether crawlspaces must be sealed and conditioned. Finally, the phrase “aggregate bed” has been removed from this footnote, because it is not relevant to the requirements of the checklist.

Change – Footnote 10 & 11

In footnote 10, the exemption for dry climates as shown in 2009 IECC Figure 301.1 and Table 301.1 has been removed and added to footnote 11. Therefore, step and kick-out flashing must be included at all roof-wall intersections, regardless of climate; however, gutters and downspouts are not required in dry climates as shown in 2009 IECC Figure 301.1 and Table 301.1. The revised language now reflects EPA’s original intent.

ENERGY STAR HERS Index Target Procedure

Refinement – Exhibit 2

The reference to the ASHRAE Handbook of Fundamentals in the “Heating Systems” section has been updated from ASHRAE 2005 Handbook of Fundamentals to ASHRAE 2009 Handbook of Fundamentals, as it is the most recent edition.

Change – Exhibit 2

The “Heating Systems” section has been revised to note that Rated Homes in 2009 IECC Climate Zones 1-6 with electric strip or baseboard heating shall have an ENERGY STAR Reference Design configured with an air-source heat pump. Similarly, Rated Homes in 2009 IECC Climate Zones 7 and 8 with electric strip or baseboard heat shall have an ENERGY STAR Reference Design configured with a ground-source heat pump.

County-Level Reference Designs (Climate Zones 1 through 8)

Clarification – Footnote 9

This footnote has been updated to explicitly note that slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade as noted in section 402.2.8 of the 2009 IECC.

Refinement – Footnote 9

This footnote has been updated to correctly note the required rigid insulation sheathing R-values of R-3 in Climate Zones 1 to 4 and R-5 in Climate Zones 5 to 8 required for Grade II wall insulation.