



# ENERGY STAR Qualified Homes [DRAFT 2/23/05] Verification Instructions

**For a home to qualify as ENERGY STAR, the following three requirements must be met:**

1. Energy measures must be in compliance with EPA guidelines for energy efficiency. These can be determined with either of two equivalent paths:
  - **Prescriptive Path:** Comply with ENERGY STAR Reference Home Requirements (see instructions below)
  - **Performance Path:** Compliance with HERS score requirements (see instructions below)
2. All energy measures must be verified and field tested according to the HERS Guidelines by a RESNET-accredited Provider.
3. The home must meet all state and local codes.

## Prescriptive Path Instructions

1. Find the county specific ENERGY STAR Home Checklist at [www.energystar.gov/homes/](http://www.energystar.gov/homes/).
2. Build a home to meet the ENERGY STAR Reference Home Checklist requirements.
3. Verify Installation:
  - Field inspect to verify that each specification of the home (e.g., air conditioner efficiency, insulation values, etc.) is correctly installed.
  - Complete the Thermal Bypass Inspection Checklist, noting “Yes” or “No” for each measure.
  - Field verify the on-site envelope leakage and duct leakage of the built home.
4. Calculate Savings Values:
  - Identify appropriate foundation type.
  - Multiply house size by the Estimated Monthly Savings listed for the appropriate foundation type in the Estimated Savings Table, then divide by 1,000 and enter the dollar value.
  - Multiply house size by the Estimated Energy Savings Value listed for the appropriate foundation type in the Estimated Savings Table, then divide by 1,000 and enter the dollar value.
5. Submit Home for the ENERGY STAR:
  - If all required measures listed on the ENERGY STAR Reference Home Checklist and Thermal Bypass Inspection Checklist are verified to be installed correctly, complete all information requested in the House and Contact Information section, sign the signature block, and contact a HERS Provider to have them submit the home for the ENERGY STAR.
6. Maintain copies of completed ENERGY STAR Reference Home Checklist and Thermal Bypass Checklist in files per RESNET documentation requirements for HERS Providers.
7. Affix the ENERGY STAR Label to the inside of the home’s breaker box.

## Performance Path Instructions

1. Complete an Initial HERS Modeling Analysis:
  - Complete plan take-off for the house that is being built and input all of the data into a RESNET-approved HERS rating software program.
  - Each home will receive a minimum HERS score requirement to meet ENERGY STAR.
  - Run the ENERGY STAR report to determine the minimum HERS score required to meet ENERGY STAR and the HERS score of the proposed home.
  - Change the specifications of the home as necessary to meet the minimum HERS score requirement.
2. Build a home to meet the specifications determined in the RESNET-approved HERS rating software program.
3. Verify Installation:
  - Field inspect to verify that each specification of the home (e.g., air conditioner efficiency, insulation values, etc.) is correctly installed.
  - Complete the Thermal Bypass Inspection Checklist, noting “Yes” or “No” for each measure.
  - Field verify the on-site envelope leakage and duct leakage of the built home.
4. Finalize HERS Modeling Analysis:
  - Update the initial HERS modeling analysis with the field verified values.
  - Run the ENERGY STAR report to confirm that the “as designed” home has a HERS score that meets or exceeds the minimum required HERS score.
5. Submit Home for the ENERGY STAR:
  - The ENERGY STAR report should be submitted by the HERS Provider for the ENERGY STAR.
6. Maintain copies of all RESNET-approved HERS rating software files per RESNET documentation requirements for HERS Providers.
7. Affix the ENERGY STAR Label to the inside of the home’s breaker box.



# ENERGY STAR Reference Home Checklist

Minimum Requirements for Montgomery County, MD (IECC Climate Zone 4 <sup>1</sup> ) See Page 3 for Endnotes.		Installation Verified
Cooling <sup>2</sup>	Air Conditioner: Right-Sized 13 SEER ; or ENERGY STAR Qualified Heat Pump <sup>3</sup> - Split System: Right-Sized 14 SEER, 12 EER; or ENERGY STAR Qualified Heat Pump <sup>3</sup> - Package: Right-Sized 14 SEER, 11 EER	
Heating <sup>2</sup>	ENERGY STAR Qualified Gas Furnace: Right-Sized 90% AFUE; or ENERGY STAR Qualified Heat Pump <sup>3</sup> - Split System: Right-Sized 8.5 HSPF; or ENERGY STAR Qualified Heat Pump <sup>3</sup> - Package: Right-Sized 8.0 HSPF; or ENERGY STAR Qualified Boiler <sup>4</sup> : Right-Sized 85% AFUE; or Oil Furnace: Right-Sized 85% AFUE	
Thermostat <sup>3</sup>	ENERGY STAR Qualified Thermostat	
Ductwork	Ducts Sealed and Leakage Tested <sup>5</sup> : ≤ 4 cfm to outdoors / 100 sq.ft. Duct Insulation <sup>6,7</sup> : R-8	
Envelope	Envelope Sealed and Infiltration Tested <sup>8,9</sup> : ≤ 0.35 ac/h Thermal Bypass Inspection <sup>10</sup> : Complete checklist Ceiling Insulation <sup>7</sup> : R-38; and Wood Framed Wall Insulation <sup>7</sup> : R-15; and Floor Above Unconditioned Space Insulation <sup>7</sup> : R-19; and/or Basement Wall Insulation <sup>7</sup> : R-13 or R-10 continuous; and/or Slab-on-grade Insulation <sup>7</sup> : R-10 to 2 ft. in depth; and/or Crawlspace Wall Insulation <sup>7</sup> : R-13 or R-10 continuous or Total UA Alternative <sup>7</sup> : UA ≤ 2004 IECC UA	
Windows <sup>11</sup>	ENERGY STAR Qualified Windows: U-Value ≤ 0.40, SHGC ≤ 0.55	
Water Heater	Gas Water Heater: 0.60 EF or higher; or Electric Water Heater: 0.92 EF or higher; or Oil Water Heater: Integrated with 85% AFUE Boiler	
Lighting and Appliances <sup>12,13</sup>	5 or More ENERGY STAR Light Fixtures, Ceiling Fans and/or Appliances	

Estimated Savings Table <sup>14</sup> Per 1,000 Sq.Ft. of Conditioned Floor Area				Calculated Savings
Foundation Type	Slab-on-grade	Basement	Crawlspace	
Estimated Monthly Savings	\$35	\$40	\$35	
Estimated Energy Savings Value	\$2,500	\$3,000	\$2,500	

House and Contact Information	
Verified Home Address: _____	Home Inspection Date: _____
Verified Home City: _____	HERS Rater Name: _____
Verified Home State, Zip code: _____	HERS Rater Signature: _____
<b>Provider Company</b>	<b>HERS Rating Company</b>
Name: _____	Name: _____
Phone: _____	Phone: _____
Address: _____	Address: _____
City: _____	City: _____
State, Zip Code: _____	State, Zip Code: _____



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**Thermal Bypass Inspection Checklist**

Thermal Bypass	What to Inspect	Complies (Y/N)
1. Shower/Tub at Exterior Wall	Exterior walls behind tub or shower have been fully insulated	
	Exterior walls behind tub or shower have been faced with air barrier material	
2. Insulated Floor above Garage	Floor framing is completely filled with insulation or insulation is snug against sub-floor	
	Air barrier is installed at any exposed edges of insulation	
3. Attic Knee Walls	Air barrier is installed on attic side of insulated wall	
	Insulation is in complete alignment with interior wall finish	
4. Attic Hatch/Drop-down Stair	Attic opening is fully gasketed for an air-tight fit	
	Hatch is covered with insulation that is attached and fits snugly in framed opening	
5. Cantilevered Floor	Floor framing is completely filled with insulation or insulation is snug against sub-floor	
	Air barrier installed at any exposed edges of insulation	
6. Duct Shafts	Opening is enclosed as required with flashing and any remaining gaps are sealed with caulk or foam	
7. Flue Shaft	Opening is fully enclosed as required with flashing	
	Combustion clearance between flue and combustible flashing (e.g., OSB panel) are properly closed with metal collars and any remaining gaps are sealed with fire-proof caulk or foam	
8. Piping Shaft/ Penetrations	Opening is fully enclosed as required with flashing and any remaining gaps are sealed with caulk or foam	
9. Dropped Ceiling/ Soffit	Air barrier is fully aligned with insulated framing and any gaps are fully sealed with caulk or foam	
10. Fireplace Wall	Air barrier is fully aligned with insulated framing in framed shaft behind fireplace and any gaps are fully sealed with caulk or foam	
11. Staircase Framing at Exterior Wall/Attic	Air barrier is fully aligned with insulated framing and any gaps are fully sealed with caulk or foam	
12. Whole-house Fan Attic Penetration	An insulated cover is provided that is gasketed to the framed opening	



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## Specification Notes

1. The appropriate climate zone for each building site is determined by the 2004 International Energy Conservation Code (IECC), Figure 301.1.
2. All requirements for ENERGY STAR qualified equipment shall be based on the latest ENERGY STAR specifications. Heating and cooling equipment should be sized according to ACCA Manual S specifications; ducts should be sized to Manual D specifications; both should be based on Manual J load calculations.
3. In homes with heat pumps, programmable thermostats must have "ramp-up" technology to prevent the excessive use of electric back-up heating.
4. In homes with oil or gas hydronic equipment, domestic water heating must be provided by the space heating boiler (tankless).
5. Ducts must be sealed and tested to 4 cfm to outdoors / 100 sq. ft. of conditioned floor area. Duct leakage must be determined and documented by a RESNET-certified rater using a RESNET-approved testing protocol.
6. To prevent condensation, a minimum of R-4 insulation is recommended for ducts in conditioned space.
7. Insulation shall meet the prescriptive requirements of the 2004 IECC Table 402.1, equivalent U-Factor requirements of the 2004 IECC Table 402.1.2, or Total UA Alternative of the 2004 IECC section 402.1.3.
8. Tested envelope leakage must be determined and documented by a RESNET-certified rater using a RESNET-approved testing protocol.
9. To ensure consistent exchange of indoor air, installation of a mechanical ventilation system that meets the minimum requirements of ASHRAE Standard 62.2 is recommended.
10. Each Thermal Bypass Inspection Checklist item must be verified. The Checklist includes the following 12 areas:
  1. Shower/Tub at Exterior Wall
  2. Insulated Floor above Garage
  3. Attic Knee Walls
  4. Attic Hatch/Drop-down Stair
  5. Cantilevered Floor
  6. Duct Shafts
  7. Flue Shaft
  8. Piping Shaft/ Penetrations
  9. Dropped Ceiling/Soffit
  10. Fireplace Wall
  11. Staircase Framing at Exterior Wall/Attic
  12. Whole-house Fan Attic Penetration
11. The specifications for ENERGY STAR qualified windows can be found at [www.energystar.gov](http://www.energystar.gov). For homes with window area exceeding 21% window to floor area (WFA), the following additional requirements apply:
  - a. In IECC Climate Zones 1, 2 and 3, an improved window Solar Heat Gain Coefficient (SHGC) is required and is determined by:

**Required SHGC = [0.18 / WFA] \* [ENERGY STAR SHGC]**

*Where the ENERGY STAR SHGC is the minimum required SHGC of a climate appropriate ENERGY STAR qualified window.*

Note: Solar window screens may be used to meet required SHGC beyond the ENERGY STAR SHGC. The overall SHGC for a window unit with solar screen is determined by the following equation:  
**[(window SHGC) x (solar screen SHGC) x (% area covered)] + [window SHGC x % area not covered].**
  - b. In IECC Climate Zones 5, 6, 7 and 8, an improved window U-Value is required and is determined by:

**Required U-Value = [0.18 / WFA] \* [ENERGY STAR U-Value]**

*Where the ENERGY STAR U-Value is the minimum required U-Value of a climate appropriate ENERGY STAR qualified window.*
12. Any combination can be installed to meet this requirement. ENERGY STAR qualified lighting fixtures installed in the following locations can not be counted towards compliance with the ENERGY STAR reference home: storage rooms of any kind (e.g., closets, pantries, sheds), laundry rooms or garages. Additional efficiency and savings can be achieved by installing other ENERGY STAR qualified products throughout the house (e.g., additional lighting, appliances, etc.). For more information, visit [www.energystar.gov](http://www.energystar.gov).
13. EPA currently plans to require the ENERGY STAR Advanced Lighting Package (ALP) in 2009. To learn more, refer to the ALP quick link at [www.energystar.gov/homes](http://www.energystar.gov/homes).
14. For home buyers interested in an energy efficient mortgage, Fannie Mae requires estimated monthly energy savings and the estimated net present value for those savings, referred to as the "Energy Savings Value" (ESV).