



ENERGY STAR Qualified Homes Builder Option Package for Single-Family Homes in South Texas

This Builder Option Package may be used in the following TX counties:

Aransas, Atascosa, Bee, Brooks, Caldwell, Calhoun, Cameron, Colorado, DeWitt, Dimmit, Duval, Edwards, Frio, Goliad, Gonzales, Guadalupe, Hidalgo, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kinney, Kleberg, La Salle, Live Oak, Matagorda, Maverick, Medina, McMullen, Nueces, Real, Refugio, San Patricio, Starr, Uvalde, Val Verde, Victoria, Webb, Wharton, Willacy, Wilson, Zavala, & Zapata.

The requirements for the ENERGY STAR Builder Option Package (BOP) are specified in the table below.

To qualify as ENERGY STAR using this BOP, a home must meet the requirements specified, be verified and field-tested, and meet all applicable codes.

Cooling Equipment (Where Provided)	Right-sized ¹ ≥14 SEER / 11.5 EER ENERGY STAR qualified A/C; <u>OR</u> Right-sized ¹ ≥14 SEER / 11.5 EER / 8.2 HSPF ENERGY STAR qualified heat pump
Heating Equipment	≥ 80 AFUE gas furnace; <u>OR</u> ≥ 14 SEER / 11.5 EER / 8.2 HSPF ENERGY STAR qualified heat pump ¹ ; <u>OR</u> ≥ 80 AFUE boiler; <u>OR</u> ≥ 80 AFUE oil furnace; <u>OR</u> Electric Resistance Heating
Thermostat	ENERGY STAR Qualified Thermostat (except for zones with mass radiant heat)
Ductwork	Leakage ² : ≤ 6 CFM to outdoors / 100 ft ² of conditioned floor area; <u>AND</u> Insulation ³ : ≥ R-6 insulation on ducts in unconditioned spaces
Envelope	≤ 7 ACH50 Infiltration ⁴
	≤ Reference UA UA Alternative Approach ⁵ ; <u>OR</u> ≥ 30 R-Value Ceiling Insulation ⁵ ; <u>AND (if applicable)</u> ≥ 30 R-Value Cathedral Ceiling Insulation ⁵ ; <u>AND (if applicable)</u> ≥ 13 R-Value Above-Grade Wood Frame Wall Insulation ⁵ ; <u>AND (if applicable)</u> ≥ 13 R-Value Floor Over Unconditioned Space Insulation ⁵ ; <u>AND</u> None Required Slab Insulation ⁵
	Wall & Ceiling Insulation Inspection to Ensure Grade 1 Insulation Installation ⁶
	Attic Radiant Barrier System
	Completed Thermal Bypass Inspection Checklist ⁶
Windows ⁷	≤ 0.50 U-Value ≤ 0.32 SHGC ≤ 12% Ratio of Window Area to Conditioned Floor Area
Water Heater ^{8,9}	Gas (EF): 40 Gal = 0.61 60 Gal = 0.57 80 Gal = 0.53 Electric (EF): 40 Gal = 0.93 50 Gal = 0.92 80 Gal = 0.89
Lighting & Appliances ^{10,11}	Five or more ENERGY STAR qualified appliances, lighting fixtures, ceiling fans equipped with lighting fixtures, and/or ventilation fans



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1. Cooling equipment shall be sized according to the latest editions of ACCA Manuals J and S, ASHRAE 2001 Handbook of Fundamentals, or an equivalent procedure. Maximum oversizing limit for air conditioners and heat pumps is 15%. The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater:

Outdoor temperatures shall be the 99.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available. Note that a higher outdoor air design temperature may be used if it represents prevailing local practice by the HVAC industry and reflects extreme climate conditions that can be documented with recorded weather data; Indoor temperatures shall be 75° F for cooling; Infiltration rate shall be selected as "tight", or the equivalent term.

In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards.

In homes with heat pumps that have programmable thermostats, the thermostat must have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating.

2. Ducts must be sealed and tested to be ≤ 6 CFM to outdoors / 100 ft² of conditioned floor area, as determined and documented by a RESNET-certified rater using a RESNET-approved testing protocol. If *total* duct leakage is ≤ 6 CFM to outdoors / 100 ft² of conditioned floor area, then leakage to outdoors does not need to be tested. Duct leakage testing can be waived if all ducts and air handling equipment are located in conditioned space (i.e., within the home's air and thermal barriers) AND the envelope leakage has been tested to be ≤ 3 ACH50 OR ≤ 0.25 CFM 50 per ft² of the building envelope. Note that mechanical ventilation will be required in this situation.
3. EPA recommends, but does not require, locating ducts within conditioned space (i.e., inside the air and thermal barriers), and using a minimum of R-4 insulation for ducts inside conditioned space to prevent condensation.
4. Envelope leakage must be determined by a RESNET-certified rater using a RESNET-approved testing protocol. To ensure consistent exchange of indoor air, whole-house mechanical ventilation is recommended, but not required.
5. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 ft² or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater.

Note that the fenestration requirements of the 2004 IRC do not apply to the fenestration requirements of the National Builder Option Package. Therefore, if UA calculations are performed, they must use the IRC requirements (with the exception of fenestration) plus the fenestration requirements contained in the national BOP. For more information, refer to the "Codes and Standards Information" document.

6. The Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.



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7. Up to 0.75% WFA may be used for decorative glass that does not meet ENERGY STAR requirements. For example, a home with total above-grade conditioned floor area of 2,000 ft² may have up to 15 ft² (0.75% of 2,000) of decorative glass.
8. To determine domestic hot water (DHW) EF requirements for additional tank sizes, use the following equations:
Gas DHW EF $\geq 0.69 - (0.002 \times \text{Tank Gallon Capacity})$; Electric DHW EF $\geq 0.97 - (0.001 \times \text{Tank Gallon Capacity})$
9. In homes with gas or oil hydronic space heating, water heating systems must have an efficiency ≥ 0.78 EF. This may be through the use of an instantaneous water heating system or an indirect storage system with a boiler that has a system efficiency ≥ 85 AFUE. Homes with tankless coil hot water systems cannot be qualified using this BOP, but can earn the label using the ENERGY STAR Performance Path requirements.
10. Any combination of ENERGY STAR qualified products may be installed to meet this requirement. ENERGY STAR qualified ventilation fans include range hood, bathroom, and inline fans. ENERGY STAR qualified lighting fixtures installed in the following locations shall not be counted: storage rooms (e.g., closets, pantries, sheds), or garages. Eligible appliances include ENERGY STAR qualified refrigerators, dishwashers, and washing machines. Further efficiency and savings can be achieved by installing ENERGY STAR qualified products, in addition to those required (e.g., additional lighting, appliances, etc.).
11. Efficient lighting fixtures represent a significant opportunity for persistent energy savings and a meaningful way to differentiate ENERGY STAR qualified homes from those meeting minimum code requirements. In 2008, EPA intends to propose and solicit industry comments on adding the ENERGY STAR Advanced Lighting Package (ALP) as an additional requirement for ENERGY STAR qualified homes in 2009. To learn more about the ALP, refer to www.energystar.gov/homes.