

Homes Across the country are built to National Energy Efficiency Standards

Is Yours?

A consumer's guide
to the National Model
Energy Efficiency Building
Code for homes



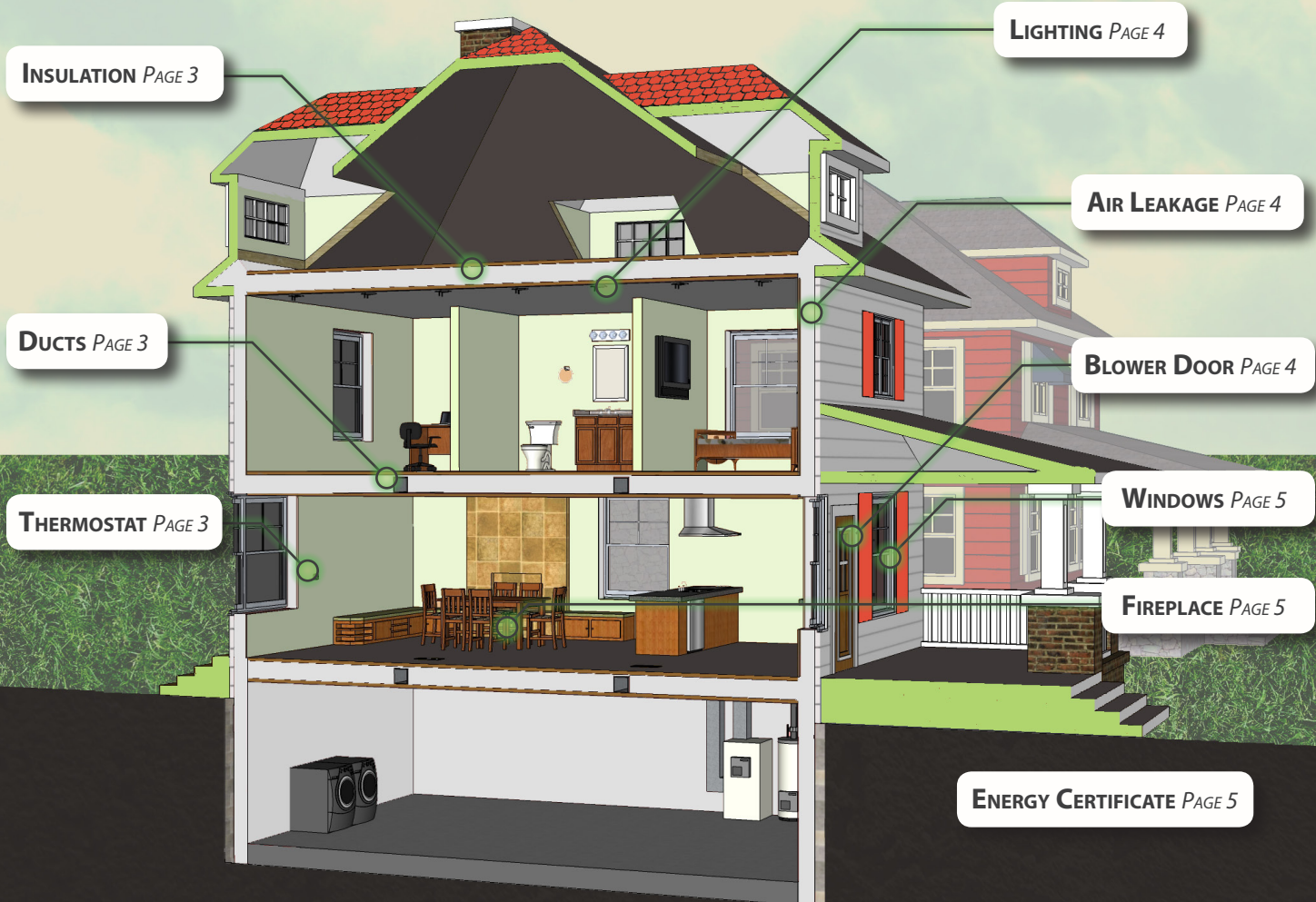
Nonprofit Publisher
of Consumer Reports

Home Energy Code Guide

FOR CONSUMERS

Does this house meet national standards?

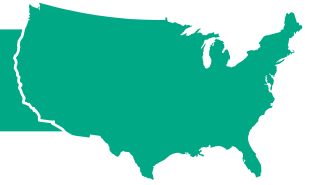
The checklist includes key aspects buyers should look for to assure that minimal modern-day energy efficiency building practices were used in the construction of a new home.¹



When builders meet or exceed these requirements and pay attention to these important details, it's a good indication of the quality of construction and an indicator of whether the home will use energy efficiently. Energy efficient homes are more comfortable, have lower energy bills, and reduce pollution.

This checklist doesn't cover every aspect of the energy code, but it addresses the key items that are visible in a new home after construction is complete. With the information below, a consumer can determine whether a new home likely meets the energy conservation code.

¹ As required by the 2009 International Energy Conservation Code (or "2009 IECC").



■ Insulation

Heating and cooling your home will account for the largest portion of your monthly energy bill. Proper insulation saves energy and reduces your monthly energy bill. Because stringency of residential building codes varies dramatically by state — and because compliance with those building codes is not always very high — even a new home is likely to have less insulation than the energy code requires.

- ❑ **Check the attic access hatch/door.** These can be a major source of air leakage in the home, creating high utility bills and uncomfortable drafts. The hatch or door to the attic should be weather-stripped and insulated. They should be well-made so that they are airtight when you close them (Test by closing door or hatch on a piece of paper. Can the paper be pulled out when the hatch/door is closed?). The insulation should be attached so that it isn't damaged or become loose when the hatch or door is used.
- ❑ **Get under the house and look at the crawl space.** Either the floor over the crawl space should be insulated or the crawl space walls should be insulated. Insulation should be attached securely without gaps.

■ Ductwork

Leaky ducts can be responsible for 10-30% of energy loss in a home. To avoid this, leaks should be sealed, ducts should be insulated when running through un-insulated areas and testing may be required.

- ❑ Unless the underside of the roof and attic walls are insulated, when ductwork runs through attic space, it must be **insulated to a minimum of R-8**. Is the attic insulated? Look at the label on the ductwork insulation – what R-level is it?
- ❑ **All ductwork should also be sealed with mastic** (a special type of caulk that is easily visible), duct tape isn't sufficient.
- ❑ In addition, **the code requires that the entire duct system be tested for leaks** if any part of the ductwork is located in an un-insulated crawlspace, attic, or garage. Leaky ducts are a major source of energy loss which means that this requirement is extremely valuable to homeowners in making homeownership affordable, month after month. If there is ductwork in an un-insulated crawlspace, attic or garage, ask for a copy of the report documenting the air tightness.



Insulated attic hatch and insulated ducts

1



Proper installation

2



This duct has been sealed but not insulated

3



A programmable thermostat

■ Programmable Thermostat

Programmable thermostats can generate annual energy savings of 10%. A home with a forced-air furnace heating system must have a programmable thermostat installed, but they are a good idea in almost any home. The average cost of a programmable thermostat ranges from \$30 to \$50.

- ❑ **Is a programmable thermostat installed?**

Home Energy Code Guide

■ Energy Efficient Lighting

Lighting has an enormous impact (approximately 12%) on the energy use in homes. Some examples of hardwired fixtures include lighting in kitchens and bathrooms, recessed lighting, hallway lights, and exterior lights next to the front door and garage door. High efficiency bulbs often include compact fluorescents, high-efficiency halogens, and LEDs. The energy conservation code requires that the builder put high efficiency light bulbs in at least 50 percent of the lighting fixtures that are hardwired into the home. If the bulbs look like standard incandescent bulbs, ask the builder whether the energy efficiency lighting requirement has been met.

- Check the lights.** Do 50% of the permanent (hardwired) lighting fixtures have high-efficiency bulbs?



A compact florescent (CFL) bulb

■ Air Leakage

Air leakage is often responsible for 30% or more of total energy loss. When you insulate and air seal your home, you're preventing the escape of air that's been heated or cooled (depending on the season) by your furnace or AC unit. The longer the warm air stays inside, the less hard your furnace has to work (same for cold air and your AC unit), and the lower your energy bills will be. All joints, seams and penetrations between the inside and outside of the home should be sealed. Typically, caulk, gaskets, spray foam or weatherstripping is used to seal these air leaks. For more information on air sealing, [click here](#).

- Look at where phone lines, electrical lines, plumbing and other services enter the house. Are the holes plugged with caulk or other sealants?

What about the holes in the attic floor where pipes and ducts lead to the rooms below? Are they sealed with foam, caulk, or other materials to prevent airflow?

Why Do Air Leaks Matter?

If a home is not properly sealed, dirt, dust, and moisture enters the home and can lead to a variety of respiratory problems including asthma and allergies. Did you know that up to 40 percent of the air we breathe on the first floor of our home comes from the crawlspace?

- Open the cabinets under the kitchen sink, under the kitchen island, under bathroom sinks, etc., and see where pipes lead to the floor below or out through walls. Are the spaces around the pipes filled with caulk, foam or other materials to prevent airflow?

- In the basement, look at exterior walls where pipes and wires lead to the outside. Are there airspaces around the pipes/wires or have they been sealed? Check where pipes and ducts pass up through the basement ceiling to the floor above. Are there gaps and spaces that create drafts and waste energy or are they sealed tightly?

■ Blower Door Test

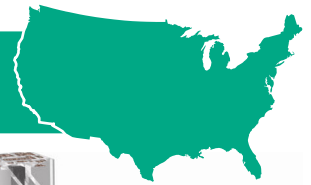
One way that home builders can demonstrate that they've sealed air leaks in a new home is to have a "blower door" test done. Ask whether a blower door test was conducted on the home and, if so, request a copy of the results. NOTE: The national model energy code requires new homes to be tested with blower doors, unless the air sealing in the home was inspected by a qualified and independent professional. Having a home professionally inspected and/or tested is an important safeguard for consumers. Alternatively, tested air leakage must be less than "seven air changes per hour (ACH) when measured with a blower door at a pressure of 33.5psf (50Pa)". To standardize the test for different homes and different parts of the country, the equipment used for the test is set at a standardized pressure level (33.5psf or 50Pa). Very efficient homes may have leakage rates of only .6-2.5 with a pressure of 50Pa. For more information on blower door testing [click here](#).

- Was a blower door test done?**



Blower door test

4




Windows

Energy code requirements for windows, like many other parts of a house, vary from one region of the country to another. Requirements for windows include a U-factor and (sometimes) a solar heat gain coefficient. A U-factor is a rating given to a window based on how much heat loss it allows. U-factors generally range from 0.2 (very little heat loss) to 1.2 (high heat loss). Single-pane windows are about 1.0, double-paned windows about 0.5 and high-performance double-paned windows are about 0.3. Skylights and windows must meet separate U-factors. The solar heat gain coefficient measures how

well a window blocks heat from the sun. This is especially important in warm regions. [Click here](#) to determine the U-factor and solar heat gain coefficient for your area.



Double-paned window with an insulated fiberglass frame 5

 World's Best Window Co. Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.30	0.30
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S./I-P)
0.51	0.2
Condensation Resistance	—
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

A sample window certificate 6

- Ask for documentation on the U-factor and solar heat gain coefficient for windows and skylights, such as copies of window labels to confirm requirements are met.
- Look for trademarks and codes etched into the corner of the window glass and/or paper or metal labels that may be attached to the window sill, header, or tracks on the sides. Some manufacturers label their windows with serial numbers or other data that can be used to track down information on the efficiency rating. If the builder can't provide documentation, contact the customer service department of the window manufacturer to confirm the efficiency of the product installed.

Fireplaces

Generally speaking, fireplaces often reduce the energy efficiency of a home. The national model code requires that the doors of wood-burning fireplaces have gaskets to help make them airtight.

- Are gaskets installed on the doors of wood burning fireplaces?



Gasketed fireplace door 7

2009 IECC Energy Certificate		
Compliance Method	Date	
PERSCRIPTIVE	5/1/2011	
Insulation	r-value	
Ceiling/Roof	38	
Walls	13	
Floors	19	
Ducts	8	
Basement Walls	10/13	
Window and Door Ratings	u-factor	
Windows	0.35	
Doors	0.40	
HVAC Equipment	Type	Rating
GAS BOILER		75% AFUE
Water Heating	Type	EF value
Water Heater	50 GAL, GAS	0.60
General Contractor:	K + M CONTRACTORS	
Insulation Contractor:	RKM INSULATION	
Form Completed By:	<i>[Signature]</i>	

2009 IECC Certificate Example

Energy Certificate

Builders must attach a permanent certificate on or in the circuit breaker box or electric panel box that lists the materials and equipment values and ratings to demonstrate that the home meets energy conservation code requirements. The certificate provides important information for home buyers who want to verify that a home meets code requirements. The certificate should not obstruct the visibility of the circuit directory label, service disconnect label or other required labels.

- Is the certificate present on the circuit breaker/electrical box?

Alternative Compliance Path

A small number of builders meet energy code requirements by building homes that are energy efficient but don't meet the criteria specified above. These builders must demonstrate through documentation that their homes meet minimum standards. Request a copy of this documentation and have the builder or a local code official explain how the energy use or energy cost of the home meets or is less than the official comparison home.



August 2011. Consumer Home Energy Code Guide

Additional information can be found at the Building Codes Assistance Project's Consumer Page:

<http://bcap-ocean.org/consumers-take-action>

Photo Credits

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- 4 Courtesy of NREL/Dennis Schroeder
- 5 Courtesy of the Efficient Windows Collaborative
- 6 Courtesy of the Efficient Windows Collaborative
- 7 Courtesy of BCAP/Robin Snyder