

HOME ENERGY CODE GUIDE:

KNOW
YOUR
ENERGY
RIGHTS

A Consumer Guide to Minimum Standards for Energy Efficiency

If you are interested in purchasing a quality home—or want to learn more about how to make your home more energy-efficient—this guide provides a quick way to assess home energy performance. The list includes information on energy code requirements based on Chapter 11 of the 2009 International Residential Code (IRC).

Energy efficient homes are more comfortable, cost less to operate, and pollute less. When builders meet or exceed energy code requirements, homebuyers benefit from superior quality of construction and lower utility bills.

This checklist does not cover every aspect of the energy code, but looks at the requirements that are easiest to understand and see in a home after construction is complete. With the information below, a consumer can determine whether a new home likely meets the energy code or what upgrades may be needed when renovating an existing home.



BCAP Dedicated to the adoption, implementation, and advancement of building energy codes

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POLICY & ACTION FROM CONSUMER REPORTS

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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; The average cost of a program thermostat ranges from \$30-50.



CERTIFICATE REQUIREMENT

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

2009 IRC Certificate Example

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

WINDOWS

Energy code requirements for windows and doors, 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 (SHGC). 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 have U-factor of about 1.0, double-paned windows about 0.5 and high-performance double-paned windows about 0.3. Skylights, windows and doors must meet separate U-factors. The SHGC measures how well a window blocks heat from the sun. This is especially important in warm regions.

Visit: http://www.efficientwindows.org/code_overview.cfm to determine the U-factor and SHGC requirements for your area.

- Ask for documentation on the U-factor and SHGC for windows and skylights, such as copies of window labels to confirm requirements are met.
- Some manufacturers label their windows with serial numbers or other data that can be used to obtain information on the efficiency rating. 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. If the builder cannot provide documentation, contact the customer service department of the window manufacturer to confirm the efficiency of the product installed.



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INSULATION



Photo courtesy of Owens Corning



Photo courtesy of homeconstructionimprovement.com

Crawl Space

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.

Attic Door

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 won't be damaged or become loose when the hatch or door is used.

AIR LEAKAGE

Look for sources of air leakage into and out of the home. Air leakage is often responsible for 10-30% or more of total energy loss. 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.



- Check to see whether leaks have been sealed in a home by looking 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, wires and ducts lead to the rooms below? Are they sealed with foam, caulk, or other materials to prevent airflow?
- 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 places where pipes and wires lead to unheated or uncooled areas. Are these leaks sealed as well?
- Check where pipes and ducts pass up through an unheated or uncooled basement ceiling to the floor above. Are there gaps and spaces that create drafts and waste energy, or are they sealed tightly?

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?

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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 model energy code requires blower door testing in new homes, 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 33.5 pounds per square foot (33.5psf) or 50 pascals (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 0.6 to 2.5 air changes per hour (ACH) with a pressure of 50Pa.



Photo courtesy of NREL/Dennis Schroeder

For more information on blower door testing visit:

<http://www.greenbuildingadvisor.com/blogs/dept/musings/blower-door-basics>

ENERGY-EFFICIENT LIGHTING

Lighting has an enormous impact (approximately 12%) on the energy use in homes. The energy 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. 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 can include compact fluorescents, high-efficiency halogens, and LEDs. If the bulbs look like standard incandescent bulbs, ask the builder whether the energy efficiency lighting requirement has been met.



FIREPLACE

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

For more information visit: <http://www.woodheat.org/maintenance>



Photo courtesy of BCAP/Robin Snyder (above)

Photo courtesy of Flickr/Zepfanman (right)



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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 and tested when running through unheated or uncooled areas.

- Unless the attic is heated and cooled, when ductwork runs through attic space, it must be insulated to a minimum of R-8. Look at the label on the ductwork insulation – what R-level is it?
- All ducts and air handlers should also be sealed with mastic (a special type of caulk that is easily visible). Duct tape isn't sufficient.
- In addition, the energy code requires that the entire duct system be tested for leaks if any part of the ductwork is located in an unheated or uncooled spaces. 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 unheated or uncooled space, ask for a copy of the report documenting the duct testing.

Photo courtesy
of energycodes.gov



DEFINITIONS

R-value. A measure of the insulating quality of a material. A higher R-value indicates a greater ability to insulate a space, preventing heat transfer through the material.

U-factor (U-value). An indicator of how well a window or door resists heat transfer. The lower the U-value, the lower the heat transfer, and the better the insulating value.

Solar Heat Gain Coefficient (SHGC). A measure of a window or door's ability to block heat transfer into the home from sunlight. SHGC is expressed as a number between 0 and 1.0. A low SHGC (like 0.40) indicates a window or door that transmits low amounts of heat, and will keep rooms cooler on a sunny day.

This Homeowners Guide was produced by the Building Codes Assistance Project and Consumers Union, July 2011.

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