HOME ENERGY CODE GUIDE:
FOR ALASKA HOMES


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 checklist includes information on energy code requirements based on the 2009 International Energy Conservation Code, which may be adopted in your community or as amended by AHFC’s Building Energy Efficiency Standard (BEES).

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 or BEES, 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 standards or what upgrades may be needed when renovating an existing home.
Energy code requirements for windows and doors, like many other parts of a house, vary from one zone of Alaska to another (see table on last page). 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-paned windows have U-factor of about 1.0, double-paned windows about 0.5 and high-performance triple-paned windows about 0.22. Skylights, windows and doors must meet separate U-factors (see table on last page).

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.

Programmable thermostats can generate annual energy savings of 10%. Except for spaces with radiant slab heating, a programmable thermostat must be installed. The average cost of a programmable thermostat ranges from $30-50.

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.

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### Insulation

**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, caulking, 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 telephone 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?
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.

For more information on blower door testing visit: http://www.greenbuildingadvisor.com/blogs/dept/musings/blower-door-basics

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.

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.

For more information visit: http://www.woodheat.org/maintenance
**DUCTWORK**

Leaky ducts can be responsible for 10-30% of energy loss in a home. To avoid this, all ducts should be sealed, and they 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, and filter boxes 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 space. 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.

**AHFC BEES/IECC-2009 SPECIFICATION**

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</table>

- a. Use smaller value if an energy-heel truss is used
- b. Smaller value is for continuous sheathing, larger value is for cavity fill

**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 the transmittance of solar heat through a window, it is expressed as a number from 0.0 to 1.0. Unless cooling is an issue, in Northern climates it is best to use the highest SHGC available with the most efficient (lowest U-value) window available.

This Homeowners guide was produced by the Building Codes Assistance Project and Consumers Union with assistance from the Alaska Housing Finance Corporation and the Cold Climate Housing Research Center, July 2012. Visit our websites for more information.