analysis may allow a higher U-value. Some manufacturers label their products with serial numbers or other data that can be used to track down the efficiency rating. If there is no documentation of the U-factors, try contacting the customer service department of the window manufacturer to confirm the efficiency of the installed products.

☐ Heating/Cooling System

Was the system sized in accordance with a code-accepted method? These calculations take into consideration such things as house tightness, insulation levels, and window placement and efficiency. A system sized too small could result in an uncomfortable home; if too large, it may cycle on/off more than necessary which may shorten the life of the equipment.

☐ Programmable Thermostat

If the home has a furnace, it should have a programmable thermostat which can provide an energy savings of about 10 percent when used as recommended, automatically turning the temperature down 10 degrees when the home is unoccupied or during the night.

☐ Heating Ducts

Check that all the seams in the ductwork are sealed with mastic or approved tape. Regular duct tape is not approved. Leaky ducts can be responsible for 10 to 30 percent of the energy loss in a home. In addition, the code requires the entire duct system be tested for tightness if any part of the ductwork is located in an unheated/ unconditioned part of the house, such as an unheated attic or garage. The test results should be listed on the energy component label. Supply ducts located outside of the conditioned part of the house must be insulated to at least R-8 and return ducts to at least R-6.


Ductwork sealing

☐ Air Sealing

The energy code requires air sealing around windows, doors, electrical boxes on exterior walls, and ceilings and openings where pipes and wires pass through the building shell. Air leakage is often responsible for 10 to 30 percent of total home energy loss. Check to see if pipes, wires and utility lines, and other openings have been sealed. Most of the air leakage sites will be hidden in the attic, walls, and floor. A blower door test is an option to confirm that the sealing requirements have been met. If the blower door option was used, the testing results should be listed on the label and should be at 4 air changes per hour (ACH) at 50 Pascal pressure (listed as 4 ACH 50) or less.

☐ Blower Door Test

A blower door is a large fan assembly, temporarily placed in an exterior doorway, which draws air out of the house. Instruments measure the amount of air flow and determine the air leakage rate of the house. Very efficient tight houses may have leakage rates of only 0.6 to 2.5 ACH 50. Blower door tests will be required in 2016.


Blower door

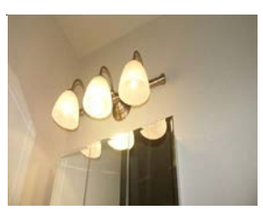
☐ (Optional) Infrared Camera Investigation


Air leakage through recessed light fixture

An infrared (IR) camera shows the temperature of the house's surfaces. Improperly insulated areas will appear colder than expected in winter and warmer than expected in summer. Consider having an IR investigation to confirm the house has been properly insulated. An IR investigation conducted with a blower door analysis can detect air leakage areas.

☐ Energy Efficient Lighting

The code requires that at least 75 percent of the permanent lighting fixtures have high efficiency light bulbs, such as compact fluorescent (CFL), high– efficiency halogens, light-emitting diodes (LEDs), etc.



For more information contact the Montana DEQ at (406) 444-6697, or go to website **www.energizemontana.com**.

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Energy Code Guide for New Home Construction

Use this checklist to help ensure your new home is comfortable, healthy, and ENERGY CODE compliant

Common Air Leaks

Air Leaking into the house
Air Leaking out of the house

March 2016

DEQ Montana Department of Environmental Quality

neea

Energy Code Guide for New Home Construction

Montana's energy code provides minimum requirements for the efficient design and construction of new and renovated houses. All new Montana houses, regardless of location, must meet the requirements of the state energy code.

You can use this guide to verify a few of the energy code requirements. While the guide doesn't include every requirement, it will help you assess a home and make an informed decision about the quality of construction and likelihood that the home will be energy efficient. Code compliance can be accomplished by completing basic air sealing requirements and following an energy code path of prescribed insulation levels, and window/door efficiencies or by using REScheck. REScheck, a free computer modeling analysis software, is available from the U.S. Department of Energy and may be enlisted to meet compliance. REScheck is available to download at **www.energycodes.gov.** Energy code path levels are listed on the energy efficiency components label on the next page.

If you don't feel comfortable using this guide, and for a more complete investigation, consider having a qualified independent third party complete a code compliance checklist. An example checklist can be found on **www.energizemontana.com**.

☐ Energy Code Compliance Label

Check that a completed energy code compliance label has been placed on or in the electrical breaker panel. The label should list the insulation levels, as well as efficiency ratings of the installed windows, doors, water heating, and heating/cooling equipment. It is also a way for the home builder to comply with Montana law, which requires builders to certify that their homes meet the statewide minimum energy code standards.

☐ Ceiling and Attic Insulation

The energy code path requirement for ceilings and attics is R-49 insulation, which is about 15 inches of fiberglass or cellulose insulation. R-38 meets code if that level is achieved over the entire ceiling/attic when an energy truss is used.

Check that the attic access hatch/door is insulated, and sealed.

Sample energy code compliance label with path levels filled in.

Energy Code Compliance Label

Address: _____

Ceiling:	Flat	R- 49
	Vaulted	R- 38
Walls:	Above grade walls	R- 21
	Basement walls	R- 19/15
	Crawlspace walls	R- 19/15
Floors:	Over unheated spaces	R- 30
	Perimeter slab for ___4___ feet	R- 10
	Under slab for _____feet_____full	R-_____
Exterior doors:		R- 3
Windows:	NFRC unit rating	U- .32
Water heater:	Energy factor (EF) rating _____	.58
Heating system:	Energy efficiency rating _____	78%
	(AFUE for gas; HSPF heat pump)	
Cooling system:	EER_____ SEER _____	
Heating ducts:	Systems sealed: ____X____ Yes per code	
	In non-conditioned areas insulated to	
	Supply R- 8_____ Return R- 6_____	
	Leakage test at rough-in _____ or finished _____	
	Leakage to outside _____ or total leakage _____	
	results _____ CFM 25 per 100 sq. ft.	
	or N/A _____	
Air Sealing:	Blower door test results ____4_____ ACH 50	
	Visual inspection: _____ Yes per code	
Whole house mechanical ventilation: _____ Yes per code		
Other (i.e., radon mitigation)_____		

Builder:_____Date:_____

Signature:_____

The builder or representative certifies compliance with ARM 24.301.162 and MCA50-60-802, by completing and signing this label.

November 2014

THIS LABEL MUST BE PERMANENTLY AFFIXED BY HOME BUILDERS TO THE BREAKER PANEL ON ALL NEW RESIDENTIAL BUILDINGS, AS REQUIRED BY SECTION 50-60-803, MONTANA CODE ANNOTATED AND 2012 IECC – SECTION 401.3

☐ Above-Grade Wall Insulation

The energy code path requires R-21 for above- ground walls. A REScheck analysis may allow a lower level. If less than R-21, ask to see a copy of the REScheck analysis.

☐ Basement Walls

Insulated Framed Wall with rim joist foam seal at arrow

Check to see if the basement walls are insulated; finishing is not required. The insulation could be placed on the outside or inside, or in combination. The energy code path requires a continuous layer of R-15, such as a layer of foam installed on the foundation wall, or R-19 if the insulation is placed in a framed wall. The rim/floor joist is located where the floor meets the wall and should be insulated and have an air barrier, usually spray foam or foam boards sealed in-place. If lower R-values are listed, ask to see a copy of the REScheck analysis, confirming code compliance.

☐ Crawlspace

Crawlspace – Foundation continuous wall insulation with rim joist foam seal at arrow

In a heated crawlspace any crawlspace vents open to the outside should be sealed shut. Check that the floor above the crawlspace or the foundation walls is insulated. Typically, the walls are insulated, creating a heated crawlspace and the ground is covered with a moisture barrier, usually plastic sheathing sealed at the edges. The insulation should be installed without gaps. The rim/floor joist located where the floor meets the foundation wall should be insulated and have an air barrier, usually spray foam or foam boards sealed in-place. If the crawlspace is heated, any crawlspace vents should be sealed shut. A heated crawlspace should have some air flow such as with a small exhaust fan drawing air out or a register in the heating duct supplying air, and an opening/ transfer grill in the floor connecting the crawlspace to the upper floor.

☐ Windows

Check the energy components label for the U-factor rating for the windows. The lower the U-factor, the better. U-factors generally range from 0.20 (very little heat loss) to 0.50 (high heat loss). The energy code path requires U-.32 or better. A REScheck