



2015

Montana Homebuilder Brief

Residential Energy Code



Montana homebuyers appreciate the comfort and warmth of the energy-efficient homes based on the energy code. All new houses in Montana must meet the minimum requirements of the 2012 International Energy Conservation Code (IECC) with the Montana amendments. This publication is a brief summary of the Montana residential energy code that took effect on November 7, 2014. The previous state energy code was based on the 2009 IECC. The differences are significant. This document was produced to assist builders and designers in complying with Montana's new energy code.

The Montana Energy Code Is Applicable Statewide

The Montana state energy code is applicable to all residential buildings constructed in Montana with the exception of garages and storage buildings. The energy code is enforced on residential buildings of less than five units located outside local code enforcement jurisdictions



through the “dwelling self-certification program.” Montana law requires, as an element of the self-certification program, that the builder provide a signed document to the building owner stating that the house complies with the state energy code. Unaltered portions of existing buildings do not need to comply with the energy code.



Major Changes to the Energy Code

- More efficient windows (from U-0.33 to U-0.32)
- More efficient skylights (from U-0.60 to U-0.55)
- More efficient crawlspace walls (from R-10/19 to R-15/19)
- Mandatory whole-house pressure test (Effective 11/07/15)
- Mandatory thermal envelope tightness checklist
- More stringent duct leakage test
- Mandatory whole-house mechanical ventilation
- Mandatory 75% high-efficacy lamps
- RESCheck™ will now be a little “better than code”

Major Montana Amendments to the 2012 IECC

- Wall insulation requirement is unchanged at R-21 in the cavity or R-13 in cavity with R-5 continuous sheathing. (2012 IECC without amendment requires R-20 cavity with R-5 continuous sheathing.)
- Maximum House Air Tightness is unchanged at 4 ACH50. (2012 IECC without amendment requires 3 ACH50.)



- Building cavities may be used as return ducts. (2012 IECC without amendment would prohibit this practice.)
- DHW distribution pipe requirements reflect minimal changes. (2012 IECC without amendment requires R-3 insulation in a much greater number of circumstances.)

What Buildings Must Comply with the Residential Energy Code?

- ☑ Residential buildings, their sites, and related equipment and systems
- ☑ Detached one- and two-family dwellings
- ☑ Multiple single-family dwellings
- ☑ Townhouses.
- ☑ Group R-2, R-3, and R-4 buildings less than four stories in height

Additions, alterations, renovations, and repairs, as well as new construction must comply with the energy code. The energy code is not retroactive. Unaltered portions of the original building do not need to comply. A good rule of thumb is that if it is new then it has to meet the energy code. However, there are several exceptions. Storm windows installed over existing windows do not have to meet the energy code, nor do glass-only replacements. The residential energy code also applies when there is a change of occupancy that results in increased energy demand and when unconditioned space becomes conditioned.

Building Envelop Compliance Paths

The energy code includes a set of mandatory requirements that are applicable regardless of the building envelop compliance path followed. There are a number of building envelop compliance paths provided in the code but only the two most commonly used paths will be discussed here. The paths not discussed provide greater flexibility but are also more complicated for demonstrating compliance.

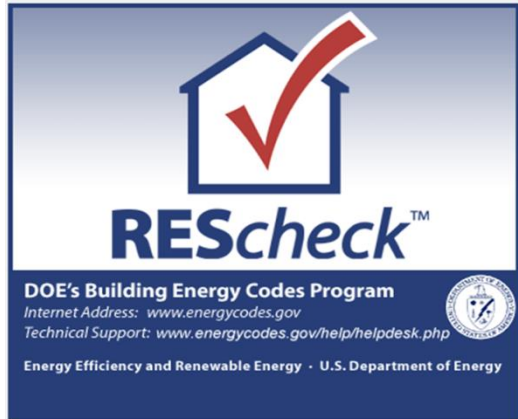
The most familiar but least flexible compliance method is the prescriptive **R-value Method** which is based on Table R402.1.1 in the code. The next most commonly used compliance method is the **Total UA Alternative Method** which is based on Table R402.1.3 in the code that is made up



entirely of U-factors. This second method allows tradeoffs between the different building envelope components and is more commonly referred to as RESCheck™ after the free USDOE software often used with this method. RESCheck™ is more flexible than the R-Value Method and is often the preferred option for mass walls such as in log construction.

Total UA (RESCheck™) Compliance Alternative R402.1.4

Total UA Alternative Method allows tradeoffs between different envelope components. For example, the walls of a particular building may not meet the R-value Method minimum requirement, but if the windows are better than code, the envelope as a whole may comply. In this method, each area of the envelope with a different thermal characteristic is multiplied by its associated area in square feet. The sum of all UA products (U-factor x area) for the proposed building is compared to a building based on the code maximum U-factors. If the UA total of the proposed building is less than the UA of the code-based building, then the building complies. RESCheck™ software uses the Total UA Alternative method to demonstrate building envelope compliance.



Download RESCheck™ at:
<http://www.energycodes.gov/rescheck>

Installation Per Manufacturer's Instructions (R403.2)

All materials, systems, and equipment must be installed according to the manufacturer's installation instructions which are an enforceable extension of the code.

R-Value Method Envelope Requirements (R402.1)

The R-values listed are for insulation only and do not include other structural components. All materials, systems, and equipment must be installed in accordance with the manufacturer's installation instructions.



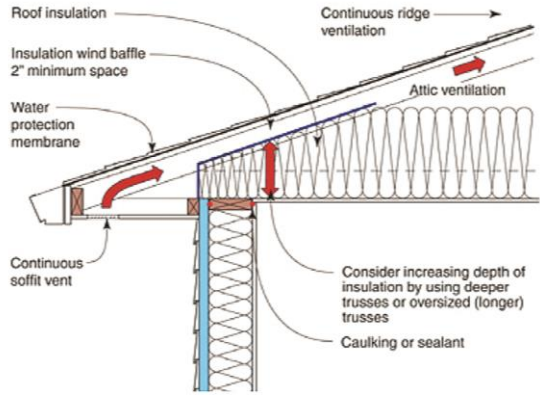
Prescriptive R-Value Compliance Method **Table R402.1.1**

Component	Requirements	Remarks
Windows & Doors	U-0.32	
Skylights	U-0.55	
Ceiling	R-49/R-38	R-38 if uncompressed insulation extends over exterior wall top plate. Where there is not enough space to achieve required R-value, R-30 is allowed in up to 250 sq. ft. or 10% of the insulated ceiling area, whichever is less. Insulation markers with at least one-inch sized numbers facing the attic hatch are required at least every 300 ft ² of attic space. Attic access hatches and doors must be weather-stripped or sealed and baffled.
Wood Frame Wall	R-21 or R-13+5	First value is cavity , second value is continuous insulation.
Mass Wall	R-15/R-20	Use second value when > 50% of R-value is on interior.
Floor	R-30	Insulation that fills cavity (R-19 min) complies. Insulation must be in contact with the underside of the floor sheathing.
Basement Wall	R-15/R-19	First value is continous, second value is for framing cavity
Slab	R-10, 4'	From top of slab for 4 ft continuous vertically, horizontally, or combination of both. R-15 if radiant heat is installed in floor.
Crawlspace Wall	R-15/R-19	First value is continous, second value is for framing cavity



Eave Baffles R402.2.3

- ☑ For air-permeable insulation in vented attics a baffle must be installed adjacent to the soffit and eave vents
- ☑ Baffle must maintain an opening equal to or greater than the size of the vent
- ☑ Baffle must extend over the top of the attic insulation
- ☑ Baffle maintains the vent space and helps prevent ice dams



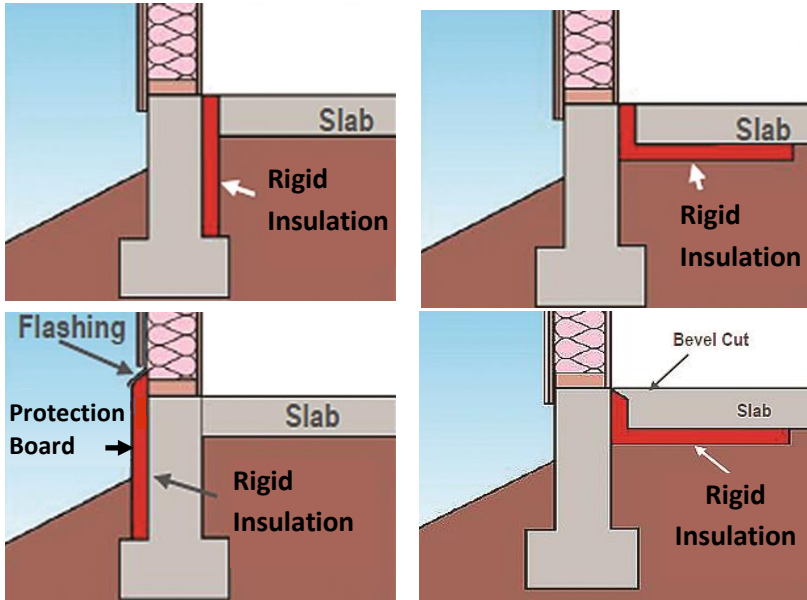
Source: USDOE Building Technologies Program, Introduction to Building Systems Performance: Houses That Work II

Slab-on-grade Floors R402.2.10

- ☑ Applies to slabs floors less than 12 inches below grade
- ☑ The insulation extends 4 feet by any combination of vertical and horizontal placement
- ☑ R-10 required for unheated slabs (no embedded heating elements)
- ☑ R-15 required for heated slabs (heated slabs include air or hydronic heat distribution within or under the slab)
- ☑ Slab-on-grade insulation must extend downward from the top of the slab on the outside or inside of the foundation wall
- ☑ Insulation extending away from the building must be protected by pavement or at least 10 inches of soil
- ☑ The top edge of the insulation installed between the exterior wall and the edge of the interior slab may be cut at a 45 degree angle.
- ☑ Exposed insulation shall have a weather-resistant protective covering extending at least 6 inches below grade level.



Slab-On-Grade Insulation Options



Crawlspaces (R402.2.10)

The IRC allows either vented or unvented crawlspaces. If the crawlspace is vented, the floor must be insulated. If the crawlspace is unvented, then the crawlspace walls must be insulated. The IRC goes on to allow two design options for an unvented crawlspace, either mechanically vented or minimally conditioned (a so-called mini-basement). In either case, the required air flow is specified by the code and an air pathway to the house common area is required (usually a transfer grill). It is critical to minimize the entry of radon, moisture, and other soil gases into the home. For that reason all unvented crawlspaces must include:

- ☑ A continuous Class I vapor retarder at exposed earth
- ☑ Vapor retarder (such as 6 mil polyethylene) must have a six-inch overlap that is sealed or taped
- ☑ Vapor retarder must extend six inches up the stem wall where it is attached and sealed



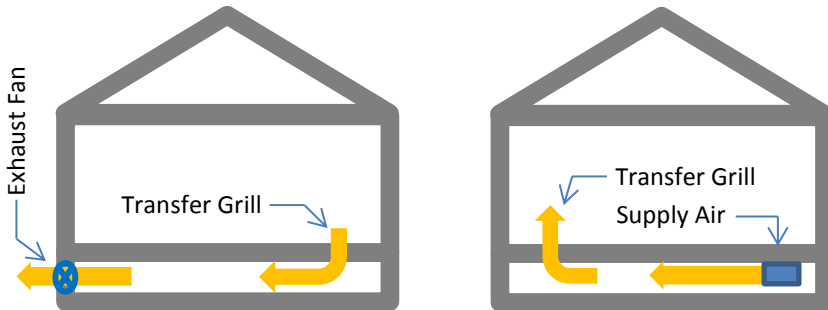
Unvented Crawlspace – Two Design Options

Continuous Exhaust to Exterior

- 1 CFM/50 SF Crawlspace Area
- Air Pathway from Common Area

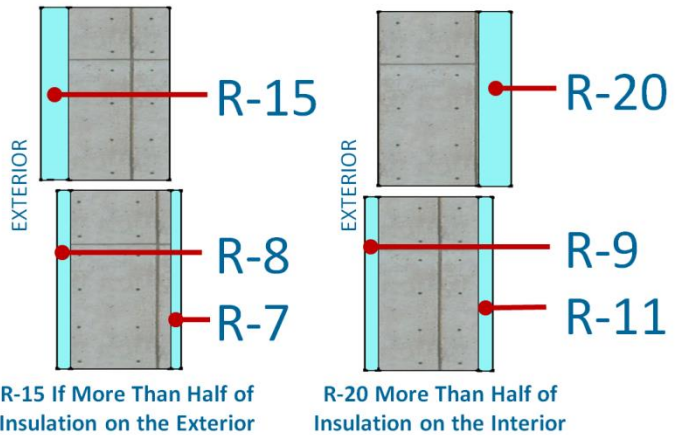
Conditioned Air Supply

- 1 CFM/50 SF Crawlspace Area
- Air Pathway to Common Area



Mass Walls R402.2.5 (including log construction)

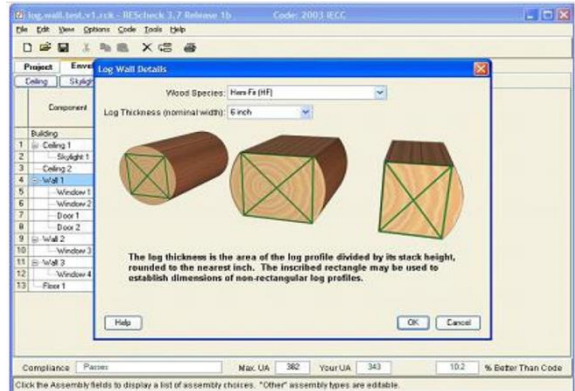
Mass walls are above grade walls of concrete, concrete block, insulated concrete forms (ICF), solid brick, earth, solid timber, and logs. R-20 applies when more than half the insulation is on the interior of



the mass wall. Log walls use mass wall requirements. Perhaps the easiest path for log home compliance is using RESCheck™ software. The screen shot on the next page is from the software and illustrates how the program has features specifically for log buildings.



Sample RESCheck™ Software Screen



Air Leakage R402.4

In the previous edition of the energy code, a home could comply with air sealing by either a blower door test (maximum leakage 4 air changes at 50 pascals) or by complying with the Air Barrier and Insulation Installation table. This table is often referred to as the “Visual Checklist.” In the new code, a home must pass a blower door test **as well as** complying with the visual checklist. ***The mandatory blower door test took effect on November 7, 2015.*** The Air Barrier and Insulation Installation table is included on the next page. Several of the requirements are then illustrated with photos on the following pages.

Blower Door Test
 ≤ 4 ACH50



Air Barrier &
Insulation
Checklist

Air Changes Per Hour at 50 Pascals (ACH50)

This is the number of times that the total volume of air in a house is exchanged for outside air each hour. A blower door depressurizes a home to 50 pascals with reference to outside. The air flow through the fan is used to calculate the ACH50.



Air Barrier and Insulation Installation – Table R402.4.1.1

☑ ☒ N/A	Component	Criteria
☐ ☐ ☐	Air barrier and thermal barrier	A continuous air barrier installed in the building envelope. Exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier sealed. Air-permeable insulation not be used as a sealing material.
☐ ☐ ☐	Ceiling/attic	The air barrier in any dropped ceiling/soffit aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop-down stair, or knee wall doors to unconditioned attic spaces sealed.
☐ ☐ ☐	Walls	Corners and headers insulated and the junction of the foundation and sill plate sealed. The junction of the top plate and top of exterior walls sealed. Exterior thermal envelope insulation for framed walls installed in substantial contact and continuous alignment with the air barrier. Knee walls sealed.
☐ ☐ ☐	Windows, skylights, and doors	The space between window/door jambs and framing and skylights and framing sealed.
☐ ☐ ☐	Rim joists	Rim joists insulated and include the air barrier.
☐ ☐ ☐	Floors (above-garage and cantilevered floors)	Insulation installed to maintain permanent contact with underside of subfloor decking.
☐ ☐ ☐	Crawl space walls	Where provided in lieu of floor insulation, insulation permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces covered with a Class I vapor retarder with overlapping joints taped.
☐ ☐ ☐	Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space sealed.
☐ ☐ ☐	Narrow cavities	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
☐ ☐ ☐	Garage separation	Air sealing shall be provided between the garage and conditioned spaces.
☐ ☐ ☐	Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air-tight, IC-rated, and sealed to the drywall.
☐ ☐ ☐	Plumbing and wiring	Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
☐ ☐ ☐	Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.
☐ ☐ ☐	Electrical/phone box on exterior walls	The air barrier installed behind electrical or communication boxes or air sealed boxes installed.
☐ ☐ ☐	HVAC register boots	HVAC register boots that penetrate building thermal envelope sealed to the subfloor or drywall.
☐ ☐ ☐	Fireplace	An air barrier installed on fireplace walls. Fireplaces have gasketed doors.



Top plate and bottom plate of exterior walls sealed.

Source: The photos on pages 17-19 are courtesy of the Northwest ENERGY STAR Homes Program and its contractor Advanced Energy.



Air barrier in any dropped ceiling aligned with insulation and any gaps in air barrier sealed.





Floor insulation in permanent contact with underside of subfloor decking.



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**Recessed light fixtures installed in thermal envelope
air-tight, IC-rated, and sealed to drywall.**

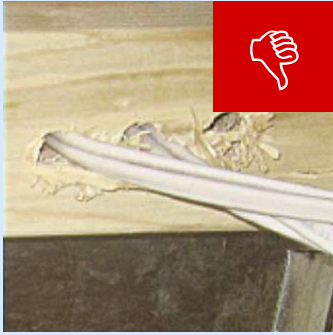


**Utility penetrations opening to exterior or unconditioned space
must be sealed. No fibrous insulation is used to fill holes.**





Utility penetrations opening to exterior or unconditioned space must be sealed.



Batt insulation cut neatly around wiring and plumbing in exterior walls.



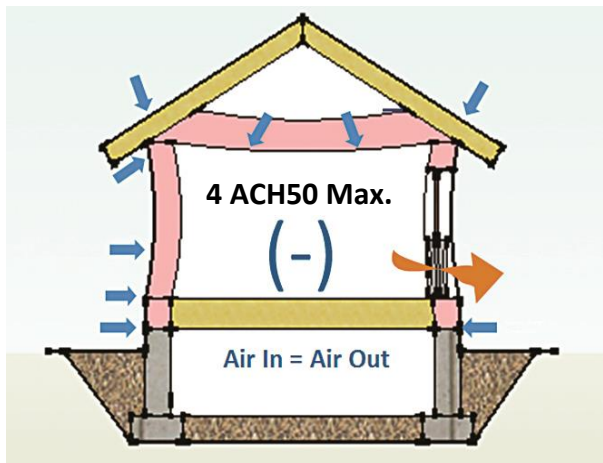
Exterior walls adjacent to showers and tubs insulated with air barrier separating them from the shower and tubs.





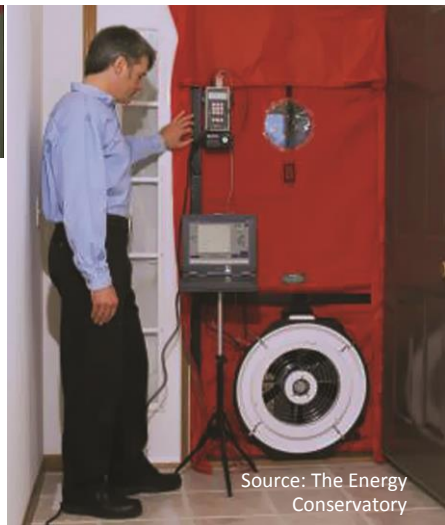
House Tightness Testing R402.4.1.2

House tightness is measured by a **blower door test**. In a blower door test, an exterior door is fitted with a nylon skirt with an opening for a large fan. For new construction, it is most common to perform a depressurization blower door test. The blower door exhausts air from the house until the home has a negative pressure of 50 Pa with reference to the outside. The amount of air that flows out of a house is equal to the amount of air that leaks into the house through the envelope and exterior ducts. A digital manometer is used to measure the pressure difference and the air flow out of the fan.



Blower Door Test

The blower door test procedure includes closing all exterior doors and windows and disabling all combustion appliances and exhaust fans. The air-flow measurement at 50 Pa is then used to calculate the air change rate for the house. While the blower door testing process is not complex, it takes care to properly set up the house and configure the digital manometer.





Systems Section R403

Programmable Thermostats R403.1.1

- ☑ Programmable thermostats are required on forced air (furnaces)
- ☑ Must be able to set back or temporarily operate the system to maintain temperatures down to 55 degrees or up to 85 degrees
- ☑ Must be initially programmed with a heating temperature no higher than 70 degrees and a cooling temperature no lower than 78 degrees.

Duct Insulation and Sealing R403.2

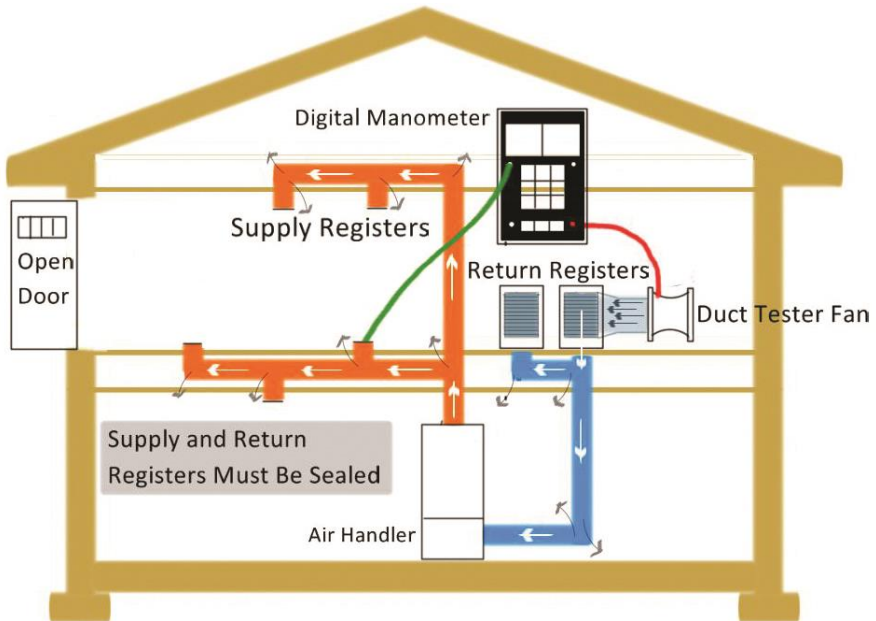
- ☑ Supply ducts in attics must be insulated to at least R-8
- ☑ All other ducts must be insulated to R-6 if outside the thermal envelop
- ☑ Duct insulation is not required if the ducts are located inside the building thermal envelope
- ☑ Ducts, air handlers, and filter boxes must be sealed
- ☑ All ducts must be sealed with mastic or UL-listed tapes
- ☑ Most duct mastic manufacturers specify that mastic should be 1/16th inch thick, about the thickness of a nickel

Duct Tightness Testing R403.2.2

- ☑ Ducts do not have to be tested if the ducts and air handler are entirely within building thermal envelope
- ☑ The ducts may be tested either at the postconstruction or rough-in stages
- ☑ If tested at Postconstruction, either the total duct leakage test or the duct leakage to the outside test may be used
- ☑ The duct tightness limit is the same for both tests, 4 cfm per SF when tested at 25 Pa.
- ☑ If air handler is not installed at the time of the test, total leakage must be equal to or less than 3 cfm per 100 ft² of conditioned floor area.



Two types of duct tightness testing are allowed by the Montana energy code. The **total duct leakage** test measures the duct leakage from the entire duct system regardless of whether it is located inside or outside the conditioned space. To conduct a total duct leakage test, all supply and return registers are sealed. The duct tightness tester fan is attached at the air handler cabinet or the return register nearest the air handler.

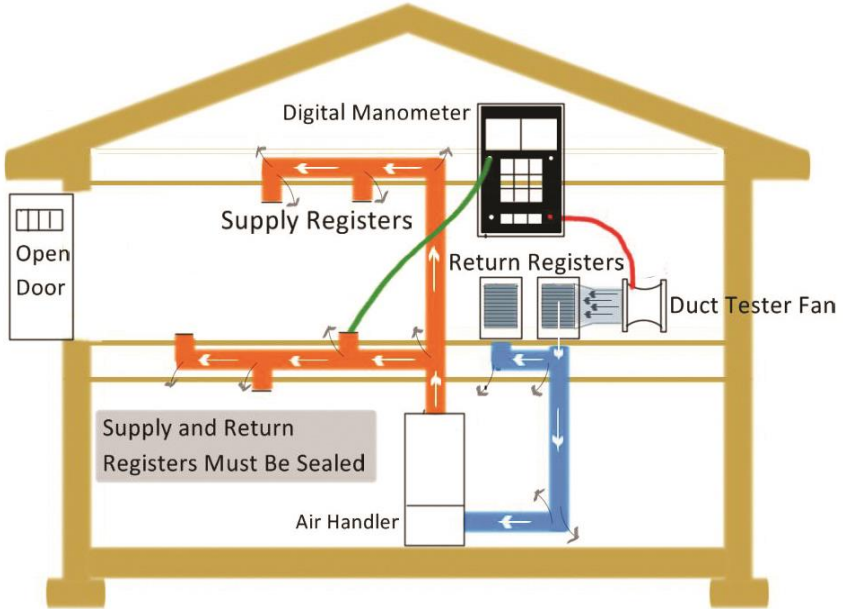


Total Duct Leakage Test

The **duct leakage to the outside** test is more complex because the blower door fan must also be used to pressurize the house to 25 Pa with reference to outside. The duct tester fan is then used to bring the pressure in the duct system to zero with reference to the house. Since air requires an opening and a pressure difference to flow, the duct leakage to the outside test eliminates air leakage within the house from the test



results (since duct pressure is the same pressure as the house). Therefore, the only leakage measured with the duct tester fan will be outside of the conditioned space



Duct Leakage to the Outside Test

Building Cavities as Ducts R4.3.2.3

- ☑ Building cavities may not be used as supply ducts
- ☑ Building cavities may be used as return ducts (This is a Montana amendment, as the IECC prohibits this practice.)



Source: USDOE Building Energy Codes University



Mechanical System Pipe Insulation **R403.3**

- ☑ Mechanical system piping such as boiler or cooling piping capable of carrying fluids above 105 degrees F or below 55 degrees F must be insulated to at least R-3
- ☑ Circulating hot water system piping must be insulated to at least R-3.
- ☑ Circulating hot water systems must also include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not operating.

Hot Water Pipe Insulation – Section R403.4.2 (Montana Amended)

R-3 insulation is required for the following:

- ☑ Piping larger than ¾ inch diameter.
- ☑ Piping serving more than one dwelling unit.
- ☑ Piping located outside conditioned space.
- ☑ Piping from the water heater to a distribution manifold.
- ☑ Piping located under a floor slab. (not part of in-floor heating system).
- ☑ Buried piping.
- ☑ Supply and return piping in recirculating systems other than demand recirculation systems.





Code Requirements for Mechanical Ventilation

The energy code requires that the ventilation be provided that complies with Chapter 15 of the IRC or Section 403 of the IMC. Both of these compliance paths require similar whole-house and local mechanical ventilation. Chapter 15 of the IRC is much more user-friendly and is the source for the discussion that follows. Both whole-house and local exhaust must be provided. It is possible to use the same equipment to satisfy both requirements.

Whole-House Mechanical Ventilation. Since the fans associated with a whole-house mechanical ventilation system will be operating for significant periods of time, the energy code requires energy-efficient fans. The following table specifies the efficiency of the fans that provide whole-house mechanical ventilation. Efficiency is given in cfm/watt.

FAN LOCATION	AIR FLOW RATE MINIMUM	MINIMUM EFFICACY	AIR FLOW RATE MAXIMUM
	(CFM)	(CFM/WATT)	(CFM)
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

The table shown on the next page specifies the minimum required whole-house ventilation air flow based on floor area and number of bedrooms. Whole-house mechanical ventilation is also referred to as “primary” or “dilution” ventilation. The code assumes that one bedroom will be occupied by two persons and each additional bedroom will be occupied by a single person. The code states that the ventilation may be either exhaust, supply, or balanced. A supply-only ventilation system is inappropriate for the Montana climate. *The whole-house mechanical ventilation system must be provided with controls that allow manual override.*



IRC TABLE M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION AIRFLOW REQUIREMENT					
DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0-1	2-3	4-5	6-7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 - 3,000	45	60	75	90	105
3,001 - 4,500	60	75	90	105	120
4,501 - 6,000	75	90	105	120	135
6,001 - 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

A house of 2,500 ft² conditioned floor area with three bedrooms would require 60 cfm of continuous ventilation as shown in the table below.

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0-1	2-3	4-5	6-7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 - 3,000	45	60	75	90	105
3,001 - 4,500	60	75	90	105	120



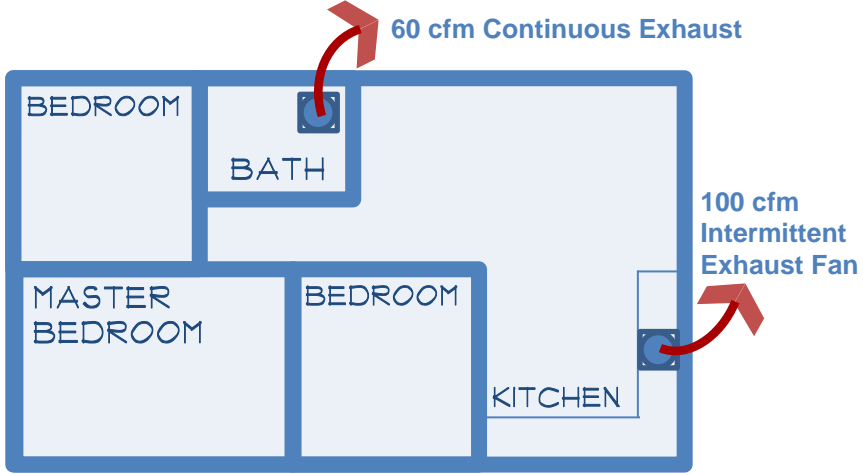
Intermittent Operation of Whole-House Ventilation. If the home uses intermittent ventilation instead of continuous ventilation, then the capacity of the ventilation system must be increased. For example, if the whole-house mechanical ventilation system will operate only 50% of the time, the capacity of the system must be increased by a factor of 2 as specified by the table below. If the system operates intermittently then it must have controls that enable operation for not less than 25% of each four-hour period.

TABLE M1507.3.3(2)						
Intermittent Whole-House Mechanical Ventilation Rate Factors						
Run-Time Percent in Each 4-Hour Segment	25%	33%	50%	66%	75%	100%
Factor	4	3	2	1.5	1.3	1.0

Local Exhaust. In addition to a whole-house ventilation system, the code also requires minimum local (also called “spot” or “point source”) exhaust capability in kitchens and bathrooms. The fans must exhaust to the outside. Recirculation fans do not comply. If continuous exhaust is used to comply with the local exhaust requirement, it may also be counted toward the whole-house mechanical ventilation requirement.

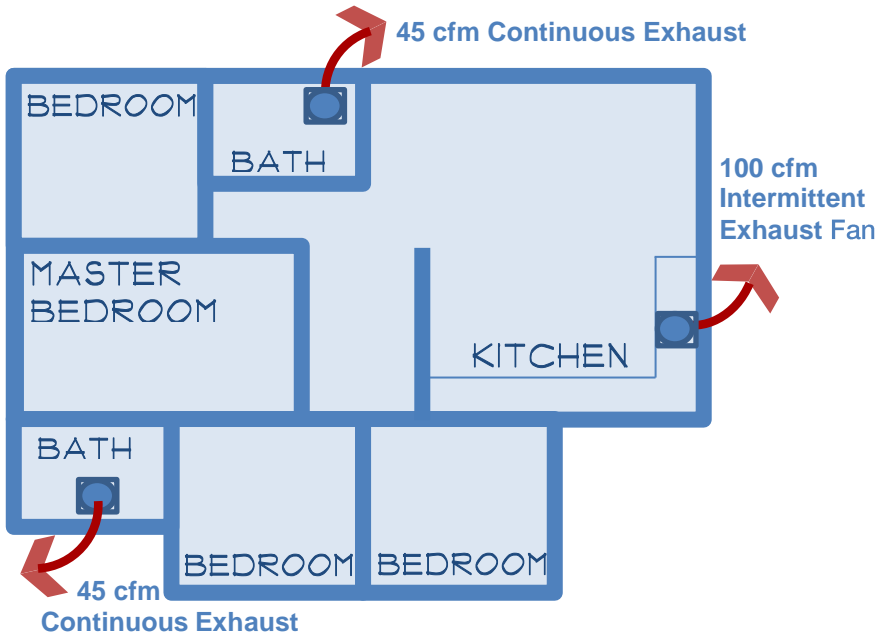
Following are three very simple examples. Example #1 is a 2,000 ft² single-story, three-bedroom house. This house requires 60 cfm of continuous ventilation. The house could comply with code with a continuous 60 cfm exhaust in the bathroom and a 100-cfm intermittent exhaust fan in the kitchen.

Table M1507.4	
Minimum Required Local Exhaust Rates for One- and Two-Family Dwellings	
Area to Be Exhausted	Exhaust Rates
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous



Mechanical Ventilation Example #1:

3 Bedroom, 2,000 ft² House Requires 60 cfm Continuous Ventilation



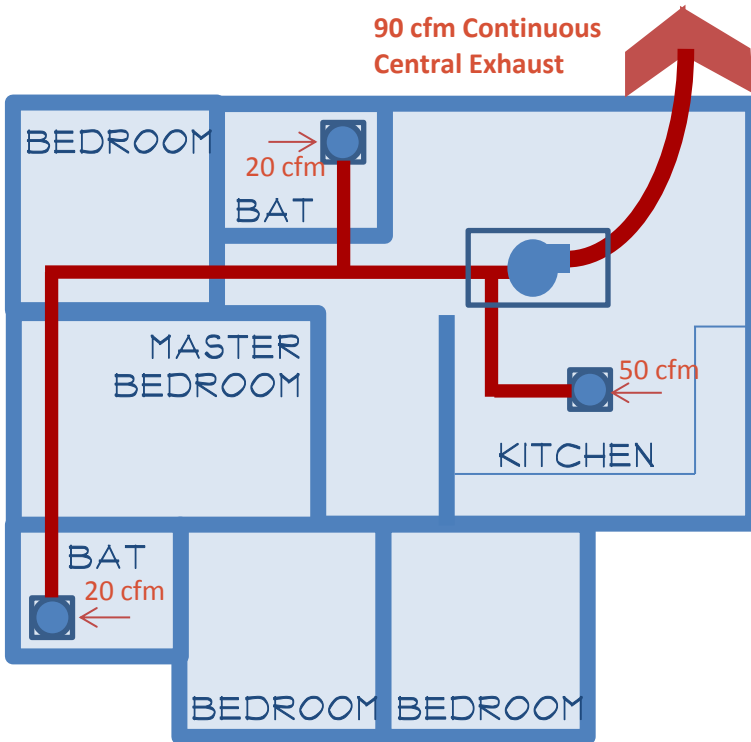
Mechanical Ventilation Example #2:

4 Bedroom, 3,600 ft² House Requires 90 cfm Continuous Ventilation



In Example #2 a four-bedroom 3,600 ft², one-story home would require 90 cfm of continuous ventilation air-flow according to Chapter 15 of the IRC. One way to accomplish this is to have a continuous 45 cfm exhaust fan in each of the two bathrooms and a 100 cfm manually controlled exhaust fan in the kitchen.

Below in Example #3 another code compliant ventilation solution is shown for the same four-bedroom, 3,600 ft², and one-story home. A central exhaust system would continuously exhaust 20 cfm from each of the two bathrooms and 50 cfm from the kitchen. This satisfies both the whole-house air flow requirement and the local exhaust requirement. A central exhaust system could feature heat recovery.



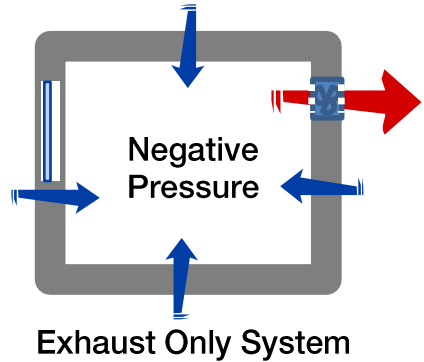
Mechanical Ventilation Example #3:

4 Bedroom, 3,600 ft² House Requires 90 cfm Continuous Ventilation



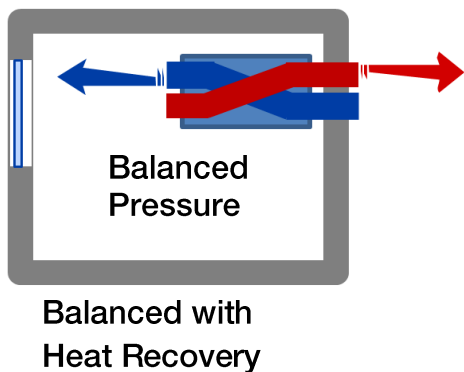
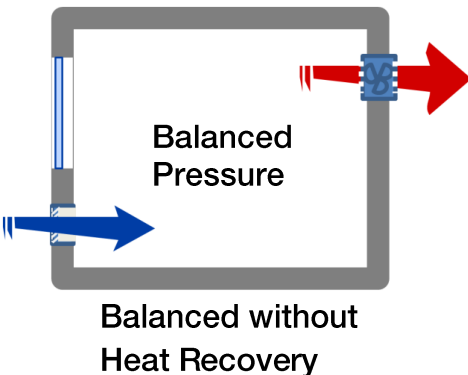
Ventilation System Types

There are two basic types of mechanical ventilation that are appropriate for Montana. **Exhaust-only systems** depressurize the house with exhaust fans without providing planned pathways for make-up air. The make-up air for exhaust-only systems comes from air leaks in the building envelope.



In **balanced systems**, there is a dedicated make-up air pathway designed into the system. Providing this dedicated make-up air pathway has several benefits. It minimizes problems of over-pressurizing and under-pressurizing spaces within the home. A balanced ventilation system is more likely to provide design air quantities. Since make-up air is provided through planned pathways air quality is improved. Balanced systems may also provide heat recovery. While a balanced ventilation system has many advantages, it is also more costly.

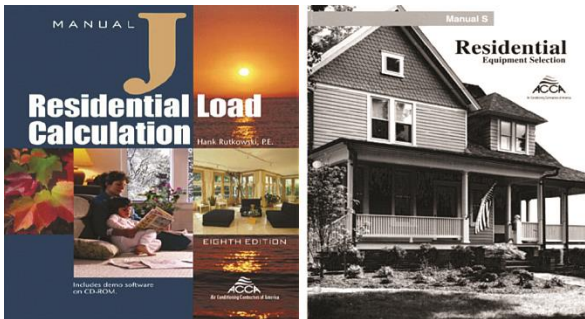
Supply-only systems pressurize the house with supply fans without providing planned pathways for exhaust air. Since pressurizing the house will force warm, moist, interior air into the building cavities *supply-only ventilation systems are not recommended for Montana*.





Equipment Sizing R403.6

While not a code change, it is worth noting that heating and cooling equipment must be sized in accordance with ACCA Manual S and based on loads calculated according to ACCA Manual J. Oversizing equipment results in short cycling, which can reduce equipment life, reduce efficiency, reduce filter effectiveness, and results in poor dehumidification during the cooling season.



ACCA Manual J and Manual S

Lighting Requirement R404.1

- ☑ Minimum of 75% of the all lamps or 75% of permanently installed lighting fixtures to be high-efficiency.

High Efficiency lamps include compact fluorescent (CFL), T-8 or smaller linear fluorescent, or LED or lamps with a minimum efficacy of 60 lumens per watt if over 40 watts, 50 lumens per watt if over 15 watts to 40 watts, and 40 lumens per watt if 15 watts or less. Low voltage lighting is exempt.





Energy Code Compliance Label R401.3

The Energy Code Compliance Label (Certificate) is required in all new residential construction and is a way for the builder to certify that the house complies with the energy code. The label must be permanently affixed to the electrical breaker panel by the builder.

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 <u>4</u> 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:	<input checked="" type="checkbox"/> 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	<u>4</u> ACH 50
	Visual inspection:	_____ Yes per code
Whole house mechanical ventilation:	_____ Yes per code	
Other (i.e., radon mitigation) _____		
Builder: _____		Date: _____
Signature: _____		
<i>The builder or representative certifies compliance with ARM 24.301.162 and MCA50-60-802, by completing and signing this label.</i>		
<i>November 2014</i>		
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		

Labels are available by calling the Montana Department of Environmental Quality (DEQ) at (406) 444-6697. Camera-ready copies are available from the DEQ website.



Residential Construction Contracts State Mandatory Requirements

State law (28-2-2201 & 2202) establishes requirements of all construction contracts for newly constructed homes. Those requirements include:

1. A disclosure that the general contractor has a current general liability policy;
2. A disclosure that the general contractor has a workers' compensation policy or is an independent contractor without employees;
3. A provision setting out the billing cycle;
4. A provision establishing procedures for handling change orders;
5. A statement of all inspections and tests that the general contractor will perform or have performed prior to, during, or upon completion of construction and a statement that the owner is entitled to receive the results of any tests conducted by the general contractor or conducted at the general contractor's request;
6. A statement that the owner is entitled at the owner's expense to have any inspections and tests conducted that the owner considers necessary;
7. A statement of all inspections and tests that the general contractor performed or had performed prior to, during, or upon completion of construction of the residence that is the subject of the potential sale; and
8. An express warranty that is valid for a period of at least 1 year from the date of the sale of the residence. The warranty must provide detailed descriptions of those components that are included or excluded from the warranty, the length of the warranty, and any specialty warranty provisions or time periods relating to certain components. The warranty provisions must also clearly set forth the requirements that must be adhered to by the buyer, including the time and method for reporting warranty claims, in order for the warranty provisions to become applicable.



References and Resources

- Montana Department of Environmental Quality Energy Codes Website
<http://deq.mt.gov/energy/energycode.mcpx>
- USDOE Building Energy Codes Program
<https://www.energycodes.gov/>
- *Montana Residential Mechanical Ventilation*, 2015, prepared by NCAT with funding from the Universal Systems Benefits collected from NorthWestern Energy customers.
- *Montana Residential Energy Code Handbook*, 2014, prepared by NCAT with funding from the Universal Systems Benefits collected from NorthWestern Energy customers.
- *Residential Buildings Energy Code Summary*, 2014, prepared by the Montana Department of Environmental Quality.
- *Builder's Guide to Cold Climates* by Joseph Lstiburek, Building Science Press, 2006



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