

Montana Residential Energy Code

Fan Location	Operating Airflow	Efficacy
HRV, ERV	Any	1.2 cfm/w
In-line fan	Any	3.8 cfm/w
Other Exhaust	< 90 cfm	2.8 cfm/w
Other Exhaust	≥ 90 cfm	3.5 cfm/w
Air-handler	Any	1.2 cfm/w

- o **Testing**, mechanical ventilation system must be tested according to manufacturer’s instructions (R403.6.3)
- o **Lighting Equipment**, all permanently installed lighting fixtures shall contain only high-efficacy lighting sources (R404.1)
- o **Interior Lighting Controls**, permanently installed fixtures must be controlled with a dimmer, occupancy sensor, or control built into the fixture except in bathrooms, hallways, exterior lighting, or safety lighting (R404.2).
- o **Exterior Lighting Controls**, when permanently installed lighting is greater than 30 watts then lighting shall be controlled by manual on/off with automatic shut-off (except when serving multiple units), must have automatic daylight sensing, and manual override returns to automatic controls within 24hours (R404.3).
- o **Additional Efficiency Package Options**, to comply with energy code one of the following options must be selected (R408.2):
 - **Enhanced Envelope Performance**, total building UA must be ≤ 95% of the reference total building thermal envelope. The SHGC of glazed fenestration must be ≤ 95% of required by Table R402.1.2.
 - **More Efficient HVAC Equipment Performance**,
 - Natural Gas Boiler ≥ 95 AFUE & AC ≥ 16 SEER
 - Air Source Heat Pump ≥ 10 HSPF/16 SEER
 - Ground Source Heat Pump ≥ 3.5 COP
 - **Reduced Energy Use in Service Water-Heating**,
 - Fossil Fuel Service Water-Heating ≥ 0.82 EF
 - Electric Service Water-Heating ≥ 2.05 EF
 - Solar Water-Heating ≥ 0.4 solar fraction
 - **More Efficient Duct Thermal Distribution System**,
 - 100% ducts and air handlers located within building thermal envelope,

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- 100% ductless or hydronic located within building thermal envelope,
- 100% duct system within conditioned space.
- **Improved Air Sealing and Efficient Ventilation System**, air leakage rate ≤ 3.0 ACH50, ERV/HRV with SRE ≥ 75%, LRMT ≥ 50%.

Total Building Performance Compliance

Referred to as the “Simulated Performance Alternative” in the 2018 IECC, this section establishes the criteria for compliance using total building performance analysis that includes heating, cooling, mechanical ventilation, and water-heating energy usage. The additional energy efficiency requirement is to chose one of the package options from R408.2 or have a simulated annual energy cost that is ≤ 95% of the energy cost of the standard reference.

Energy Rating Index (ERI) Compliance

For a home to comply with the ERI pathway it must have an ERI ≤ 51 (additional energy efficiency requirement is 5% less than ERI = 54 for Climate zone 6).

References:

REScheck™ available at no cost from USDOE at

www.energycodes.gov/rescheck

Montana Department of Environmental Quality

Deq.mt.gov/energy/Programs/code

International Codes Council, Inc.

www.iccsafe.org

Montana Residential Energy Code Handbook

www.ncat.org/energy/energy-services/



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QUICK REFERENCE

M O N T A N A



2021 International Energy Conservation Code Requirements as Amended

The energy code applies to residential buildings built in Montana. Cities, towns, and counties that choose to adopt the building code are required to enforce the energy code. Outside of these local code jurisdictions, builders are required to self-certify that the building complies with the energy code and must document energy code compliance through the self-certification process that requires the builder to provide a written statement to the homeowner stating the house complies with the energy code. The home builder may provide this certification by signing and dating the Energy Code Compliance Label developed by the Montana DEQ.

Prescriptive Compliance

- o **Log Homes**, if designed in accordance with ICC 400 meet energy code thermal envelope requirements.
- o **Energy Efficiency Certificate**, Completed and permanently posted on electrical panel (R401.3).
- o **Insulation and Fenestration Criteria**, Assemblies shall have a U-Factor equal to or less than specified in Table R402.1.2, or an R-Value greater than specified in Table 402.1.3.
- o **Ceilings with attics**, R-49 installed over 100% of the ceiling area satisfies the insulation requirement (R402.1.2).
- o **Ceilings without attics**, R-30 can be installed on 250ft² or 10% of ceiling area (whichever is less) where full-depth R-60 cannot be installed (R402.1.3).

ENERGY CODE COMPLIANCE LABEL		
Address: _____		
Ceiling:	Flat _____	R - _____
	Vaulted _____	R - _____
Walls:	Above grade walls _____	R - _____
	Basement walls _____	R - _____
	Crawlspace walls _____	R - _____
Floors:	Over unheated spaces _____	R - _____
	Perimeter slab for _____ feet _____	R - _____
	Under slab for _____ feet _____ full _____	R - _____
Exterior doors:		U - _____
Windows:	NFRC unit rating _____	U - _____
Water heater:	Energy factor (EF) rating _____	
Heating system:	Energy efficiency rating _____	
	(AFUE for gas; HSPF heat pump)	
Cooling system:	EER _____ SEER _____	
Heating ducts:	Systems sealed: _____ Yes per code	
	In non-conditioned areas insulated to	
	Supply R- _____ Return R- _____	
	Leakage test at rough in _____ or final	
	results _____ CFM 25 per 100 sq. ft	
	or N/A _____	
Air Sealing:	Blower door test results _____ ACH 50	
Whole house mechanical ventilation:	_____ Yes per code	
Other (i.e., radon mitigation, solar ready)	_____	
Builder: _____	Date: _____	
Signature: _____		
<small>The builder or representative certifies compliance with ARM 24.301.161 and MCA 50-60-802, by completing and signing this label. August 2021</small>		
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 2021 IECC – SECTION 401.3		

o **Eave Baffles**, in vented attics eave baffles must be installed in every cavity to the outer edge of the exterior wall and extend over the top of the insulation (R402.2.3).

o **Floors**, three options for floor insulation are:

1. Cavity insulation must maintain contact with underside of subfloor decking,
2. Cavity insulation must maintain contact with topside of sheathing installed to the underside of floor joists,
3. Cavity insulation must maintain contact with topside of continuous insulation installed to the underside of floor joists,

For options 2 & 3, at the perimeter insulation must extend from the bottom to top of all floor framing, floor framing must be air sealed (R402.2.7).

o **Air Barrier Installation**, air barrier components must be installed in accordance Table R402.4.1.1,

- Rim joist must have an exterior air barrier, junctions at sill plate and subfloor must be sealed,
- Crawlspace must have all penetrations air sealed, in unvented crawlspaces exposed earth must be covered with a Class I vapor retarder/air barrier,

- **Narrow cavities** must be air sealed and insulated, if they cannot be insulated, they must be air sealed,
- o **Air Leakage Testing**, blower door results cannot exceed 4.0 ACH50. If the building footprint is 1,500ft² or less then the air leakage rate cannot exceed 0.30ft³/min per ft² of footprint area. (R402.4.1.2)
- o **Controls**, at least one thermostat for each heating and cooling system, and controls on the primary systems must be programmable to a daily schedule (R403.1.1).
- o **Heat pumps with supplementary heat**, supplementary electric-resistance heat controls must prevent operation when compressor can meet demand, except during defrost (R403.1.2).
- o **Hot Water Temperature Reset**, all boilers must be installed with an automatic means to adjust boiler supply temperature to match heat load (R403.2).

Insulation and Fenestration Requirements

Component	U-Factor	R-Value
Fenestration	U-0.3	
Skylight	U-0.55	
Ceiling	U-0.026	R-60
Wood Frame Wall	U-0.045	R-21, 20+5ci, 13+10ci, 15ci
Mass Wall	U-0.06	R-15, 20 (if more than 50% of insulation is installed on the interior)
Floor	U-0.033	R-30
Basement Wall	U-0.05	R-19, 13+5ci, 15ci
Crawlspace Wall	U-0.055	R-19, 13+5ci, 15ci
Slab R-Value & Depth		R-10ci & 4ft
<u>Example:</u> 20+5ci – Insulation can be a combination of R-20 cavity insulation and R-5ci (continuous insulation)		

- o **Ducts Outside of Condition Space**, supply and return ducts with 3-inch or larger diameter shall be insulated to at least R-8, and to R-6 for ducts less than 3-inches in diameter. Underground ducts utilizing the thermal distribution efficiency method shall be listed (R403.3.1).
- o **Duct Sealing**, ducts, air handlers, and filter boxes shall be sealed with joints and seams complying with 2021 IRC or 2021 IMC (R403.3.4).

- o **Duct Testing**, not required when all ducts, air handlers, and filter boxes are within thermal boundary. Total leakage rate must be ≤ 4 CFM/100ft² of conditioned floor area tested at 25 Pa, or ≤ 3 CFM/100ft² without air handlers (R403.3.6)
- o **Building Cavities**, may be used as return ducts if there are no atmospherically vented appliances inside the building. If atmospherically vented appliances are inside the building, they must be room isolated from the building’s thermal envelope and duct leakage rates cannot exceed 4 CFM/100ft² (R403.3.7).
- o **Mechanical System Piping and Service Hot Water Systems**, mechanical system, hot water piping, and service hot water piping must comply with subsection 620.22 and L 501.2 of the Uniform Plumbing Code (UPC) 2021 edition (as amended).
- o **Mechanical Ventilation**, ventilation must comply with Section M1505 of 2021 IRC. Outdoor air must be provided continuously at a rate determined in the table below. The ventilation rate can be reduced by 30% if ventilation is supplied to each bedroom and living room, dining room, or kitchen and the system is balanced (IRC M1505.4.3).

Dwelling Unit Floor Area	Number of Bedrooms				
	0-1	2-3	4-5	6-7	> 7
< 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

o **Minimum Local Exhaust Rates** (M1505.4.4)

Area	Exhaust Rate (cfm)
Kitchens	100 intermittent, 25 continuous
Bathrooms	50 intermittent, 20 continuous

o **Whole-Dwelling Mechanical Ventilation System Fan Efficacy**, fans must meet the efficacy below (R406.6.2)