



Proposed 2019 Vermont Building Energy Codes Training

Residential Building Energy Standards (RBES) Hand Out

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Montpelier and Burlington, VT

<http://publicservice.vermont.gov/content/building-energy-standards-update>



ICC Building Safety Association of Vermont

*Working to improve public health and safety throughout Vermont –
An ICC Professional Chapter since March 2009*



**TABLE R402.1.2.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT FOR
BASE PACKAGES**

Component ^a		Package 1	Package 2	Package 3	Package 4	Package 5
		“Standard”	“SIPS”	“Thick Wall”	“Cavity Only”	“Log Homes”
Envelope	Ceiling R-Value	R-49 ^f	R-28 cont.	R-49 ^f	R-60 ^g attic / R-49 ^f slope	Construct log home to ICC 400-2017 “Standard on the Design and Construction of Log Structures” OR Table R402.1.6
	Wood Frame Wall R-Value	R-20+5 ^e OR 13+10 ^e	R-21 cont.	R-20+12 ^e	R-20 cavity	
	Common Wall Insulation	R-10	R-10	R-10	R-10	
	Floor R-Value	R-30	R-30	R-30	R-38	
	Basement/Crawl Space Wall ^c R-Value	R-15 (continuous) OR 20 (cavity) OR R13+5	R-15 (continuous) OR 20 (cavity) OR R13+5	R-20 (continuous) OR R-13+10 ^e	R-20 (continuous) OR R-13+10 ^e	
	Slab Edge ^d R-Value	R-15, 4ft OR R10 perimeter + R-7.5 under entire rest of slab	R-15, 4 ft OR R10 perimeter + R-7.5 under entire rest of slab	R-10, 4ft	R-15, 4 ft OR R10 perimeter + R-7.5 under entire rest of slab	
	Heated Slab ^d R-Value	R-15 (edge and under)	R-15 (edge and under)	R-15 (edge and under)	R-15 (edge and under)	
	Fenestration ^b (Window and Door) max. U-Value	U-0.30	U-0.30	U-0.30	U-0.28	
	Skylight ^b max. U-Value	U-0.55	U-0.55	U-0.55	U-0.55	
Air Leakage	Air Leakage ⁱ	≤3.0 ACH50 tested	≤3.0 ACH50 tested	≤3.0 ACH50 tested	≤3.0 ACH50 tested	
Mechanicals	Duct Leakage	Inside thermal boundary	Inside thermal boundary	4 CFM25 per 100 sq. ft. of CFA ^k	Inside thermal boundary	
Lighting	Percent High Efficacy Lamps ^l	90%	90%	90%	100%	

TABLE R402.1.2.2

REQUIRED POINTS BY BUILDING SIZE

Building Size	Required Points
Multifamily < 2000 square feet average size unit	4 points
<2000 square feet	5 points
2000 to 4000 square feet	7 points
>4000 square feet	10 points

TABLE R402.1.2.3

POINTS BY COMPONENT

Component		Description	Points
Envelope	Slab	R-10 below entire slab	1
	Walls - Upgraded	Above grade walls R-20+12 (or U-factor maximum 0.033 wall assembly) (Not available for base package 3) OR^b	2
	Walls - High-R	Above grade walls \geq R-40(cavity + continuous) (or U-factor maximum 0.025 wall assembly)	3
	Ceiling	R-80 attic flat / R-60 sloped, vaulted and cathedral	1
	Windows	Average U-factor \leq 0.27 OR^b	1
		Average U-factor \leq 0.22	2
Air Leakage and Ventilation	Pre-Drywall	ACH50 is tested with blower door after full insulation/primary air barrier completion but before insulation is fully enclosed/covered OR^b	1
	Tight	ACH50 \leq 2.0 and balanced ventilation with ECM ^e fans and \geq 70% SRE ^d for HRV ^c , \geq 65% SRE ^d for ERV ^c OR^b	3
	Very Tight	ACH50 \leq 1.0 and balanced ventilation with ECM ^e fans and \geq 80% SRE ^d for HRV ^c , \geq 75% SRE ^d for ERV ^c	4
Heating and Cooling ^a	Basic	ENERGY STAR basic: (1) Gas/propane furnace \geq 95 AFUE, Oil furnace \geq 85 AFUE, (2) Gas/Propane Boiler \geq 90 AFUE, Oil Boiler \geq 87 AFUE, (3) Heat pump HSPF \geq 9.0; PLUS any AC is SEER \geq 14.5 OR^b	1
	Advanced	Whole building heat/cool is (1) NEEP-listed heat pump combination ^j , (2) GSHP ⁱ , closed loop and COP \geq 3.3, (3) ATWHP ^f COP \geq 2.5 and 120F design temp, (4) Advanced wood heating system	3

TABLE R402.1.2.3 - POINTS CON'T

Component		Description	Points
Water	Basic	ENERGY STAR basic: Fossil fuel [EF 0.67 for \leq 55 gal; EF 0.77 for $>$ 55 gal] OR^b	1
	Advanced	ENERGY STAR advanced: Electric [EF or UEF \geq 2.00 for \leq 55 gal; EF \geq 2.20 for $>$ 55 gal]	2
	Low Flow	All showerheads \leq 1.75 gpm ^g , all lav. faucets \leq 1.0 gpm ^g , and all toilets \leq 1.28 gpf ^h OR^b	1
	Certified ^k	Certified water efficient design per WERS, WaterSense, or RESNETH2O	2
	Drain Heat Recovery	Drain water heat recovery system on primary showers and tubs	1
	User-Demand	Controlled hot water recirculation system with user-demand via push-button for furthest fixtures	1
Renewables	Solar Ready	Home is Solar Ready per R407.5, OR^b	1
	On-Site Generation	Solar Photovoltaic (PV) (or other on-site renewable energy system), 1 point per 1.5 kW per housing unit of renewable generation on site	1 per 1.5 kW, max. 4
	Solar Hot Water	Solar hot water system designed to meet at least 50% of annual hot water load	2
Other Measures	Monitoring	Install whole-building energy monitoring system, min. 5 circuits and homeowner access to data	1
	EV Ready	Level 2 electric vehicle charger-ready per R407.4	1
	Battery	Min. 6 kWh grid-connected dispatchable demand-response-enabled battery backup	1