



U-factor (or U) = maximum value; R-value (R) = minimum value

Building Feature			CZ 1	CZ 2	CZ 11	CZ 12	CZ 16	
Insulation	Roofs and Attics ^(A)	Option B: Ducts in Vented Attic ^(B)	Ceiling	R-38	R-38	R-38	R-38	R-38
			Below Roof Deck	Not Required	Not Required	R-19	R-19	R-19
			Radiant Barrier	Not Required	Required	Not Required	Not Required	Not Required
		Option C: Ducts in Conditioned Space	Ceiling	R-38	R-30	R-38	R-38	R-38
			Radiant Barrier	Not Required	Required	Required	Required	Not Required
	Walls	Above Grade	Framed ^{(A) (C)}	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048
			Mass Wall: Interior ^(D)	U-0.077	U-0.077	U-0.077	U-0.077	U-0.059
				R-13	R-13	R-13	R-13	R-17
			Mass Wall: Exterior ^(D)	U-0.125	U-0.125	U-0.125	U-0.125	U-0.077
		R-8		R-8	R-8	R-8	R-13	
		Below Grade	Interior ^(D)	U-0.077	U-0.077	U-0.077	U-0.077	U-0.067
				R-13	R-13	R-13	R-13	R-15
			Exterior ^(D)	U-0.200	U-0.200	U-0.200	U-0.200	U-0.053
	R-5			R-5	R-5	R-5	R-19	
	Floors	Slab Perimeter		Not Required	Not Required	Not Required	Not Required	U-0.58
								R-7
		Raised ^(A)	U-0.037	U-0.037	U-0.037	U-0.037	U-0.037	
			R-19	R-19	R-19	R-19	R-19	
		Concrete Raised	U-0.092	U-0.092	U-0.092	U-0.138	U-0.092	
R-8			R-8	R-8	R-4	R-8		
Quality Insulation Installation (QII)			HERS Verification Required					
Roofing Products	Low-sloped	Minimum Aged Solar Reflectance	Not Required	Not Required	Not Required	Not Required	Not Required	
		Minimum Thermal Emittance	Not Required	Not Required	Not Required	Not Required	Not Required	
	Steep-sloped	Minimum Aged Solar Reflectance	Not Required	Not Required	0.20	0.20	Not Required	
		Minimum Thermal Emittance	Not Required	Not Required	0.75	0.75	Not Required	
Fenestration	Maximum U-factor ^(E)		0.30	0.30	0.30	0.30	0.30	
	Maximum Solar Heat Gain Coefficient (SHGC) ^(F)		Not Required	0.23	0.23	0.23	Not Required	
	Maximum Total Area		20%	20%	20%	20%	20%	
	Maximum West-facing Area		Not Required	5%	5%	5%	Not Required	
Doors ^(G)	Maximum U-factor		0.20	0.20	0.20	0.20	0.20	

Building Feature			CZ 1	CZ 2	CZ 11	CZ 12	CZ 16
Space Heating ^(H)	Electric Resistance Systems		Not Allowed				
	Minimum Annual Fuel Utilization Efficiency (AFUE) for Gas-fueled Systems		Central furnace: < 225 kBtuh: 81% AFUE ^(I)				
	Electric Readiness for Gas-fueled Systems		For requirements, see the <i>Residential Electric Readiness Fact Sheet</i> at bit.ly/ECA-building-fact-sheets .				
	Minimum Heating Seasonal Performance Factor (HSPF or HSPF2) for Heat Pumps Single-phase Air Source		Manufactured before 1/1/2023: ✦ Split: < 65 kBtuh 8.2 HSPF ^(I) ✦ Packaged: < 65 kBtuh 8.0 HSPF ^(I) Manufactured on or after 1/1/2023: ✦ Split: < 65 kBtuh 7.5 HSPF2 ^(I) ✦ Packaged: < 65 kBtuh 6.7 HSPF2 ^(I)				
Space Cooling	Heat Pumps: Seasonal Energy Efficiency Ratio (SEER/SEER2)		Manufactured before 1/1/2023: Packaged or Split: 14 SEER Manufactured on or after 1/1/2023: ✦ Packaged: 13.4 SEER2 ✦ Split: 14.3 SEER2				
	Central Air Conditioning (SEER/SEER2 EER/EER2)		Installed before 1/1/2023: ✦ Packaged: 14 SEER/11.0 EER ✦ Split < 45: 14 SEER/12.2 EER ✦ Split ≥ 45: 14 SEER/11.7 EER Installed on or after 1/1/2023: ✦ Packaged: 13.4 SEER2/10.6 EER2 ✦ Split < 45: 14.3 SEER2/11.7 EER2 ✦ Split ≥ 45: 13.8 SEER2/11.2 EER2				
	Refrigerant Charge Verification or Fault Indicator Display		Not Required	Required	Required	Required	Not Required
	Whole House Fan (WHF) ^(J)		Not Required	Not Required	Required	Required	Not Required
	Central Fan Integrated (CFI) Ventilation System Fan Efficacy		If CFI used for outside air ventilation, HERS verification of fan efficacy is required.				
Duct Insulation ^(K)	Minimum R-value by Duct Location	Vented Attic	R-8	R-8	R-8	R-8	R-8
		Conditioned Space	R-6	R-6	R-6	R-6	R-6
Water Heating		✦ One 240-volt heat pump water heater (HPWH) located in garage or conditioned space ^{(L)(M)(N)} ✦ One HPWH NEEA Tier 3 or higher ^{(L)(N)} ✦ One solar water-heating (solar thermal) system with electric backup, minimum solar savings fraction of 0.7 ✦ One instantaneous electric resistance water heater with point-of-use distribution allowed in new dwelling units with conditioned floor area of 500 ft ² or less ^(O)					
Photovoltaic (PV) and Battery Systems		For information on PV and battery system requirements that apply to single-family buildings, see the <i>Energy Code Ace Single-family and Low-rise Multifamily Solar and Battery Systems Fact Sheet</i> at bit.ly/ECA-building-fact-sheets .					



Notes

- A** The U-factors/R-values shown are for wood-frame construction with insulation installed between the framing members, with continuous insulation where appropriate. For alternative construction assemblies, see [§§150.1\(c\)1A, B and C](#).
- B** For Option B, where R-19 insulation is required to be installed directly below the roof deck, the roofing material must provide an air space between the roofing and the roof deck (i.e., tile roofing).
- C** Any combination of cavity insulation and/or continuous insulation that results in a U-factor \leq the Prescriptive requirement is allowed. See [Joint Reference Appendix JA4](#) for construction assemblies that comply with Energy Code requirements.
- D** Mass wall has a thermal heat capacity greater than or equal to 7.0 Btu-h-ft². For above and below grade mass walls, "interior" denotes insulation installed on the inside surface of the wall, "exterior" denotes insulation installed on the outside surface of the wall, and the Energy Code's Prescriptive Approach assumes that rigid continuous insulation is installed.
- E** The installed fenestration products must meet the requirements of [§150.1\(c\)3](#). Specifically note exceptions in [§150.1\(c\)3A](#).
- F** The installed fenestration products must meet the requirements of [§150.1\(c\)4](#).
- G** Doors with \geq 25% glazed area must meet applicable fenestration requirements in [§100.1\(b\)](#).
- H** A supplemental heating unit may be installed in a space served directly or indirectly by a primary heating system, provided that the unit thermal capacity does not exceed 2 kW or 7,000 Btu/h and is controlled by a time-limiting device not exceeding 30 minutes.
- I** For information about other HVAC equipment efficiency requirements, refer to Chapter 4 of the [2022 Single Family Residential Compliance Manual](#).
- J** When whole house fans (WHF) are required, only those listed in the Home Ventilating Institute Certified Products Directory may be installed. Compliance requires installation of one or more WHFs with total airflow capable of meeting or exceeding a minimum 1.5 CFM/ft² of conditioned floor area per [§150.1\(c\)12](#). WHF are not required for dwelling units less than 500 ft².
- K** Duct sealing is a Mandatory requirement in all Climate Zones, as confirmed through HERS field verification and diagnostic testing. See [§150.0\(m\)11](#). Ducts in conditioned space require that the duct systems and air handlers of HVAC systems be located in conditioned space and confirmed by field verification and diagnostic testing. See [Residential Reference Appendix RA3.1.4.3.8](#).
- L** One 120-volt HPWH is allowed for new dwelling unit with one bedroom or less.
- M** In Climate Zones 1 and 16, a compact hot water distribution system is required as specified in [Residential Reference Appendix RA4.4.6](#).

- N** In Climate Zone 16, a drain water heat recovery system is required as specified in [Residential Reference Appendix RA3.6.9](#).
- O** More information on point-of-use distribution is specified in [Residential Reference Appendix RA4.4.5](#).

For More Information

CALIFORNIA ENERGY COMMISSION

www.energy.ca.gov

2022 Single-Family Residential Compliance Manual

bit.ly/CEC-2022-SF-residential-compliance-manual

Glossary

bit.ly/2022-Energy-Code-Glossary



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