

## Verifying Energy Efficiency Requirements

This quick reference guide is for building inspectors and contractors following the 2013 Building Energy Efficiency Standards (Title 24, Part 6). These minimum energy efficiency requirements of common building components apply to single family residential new construction in Bay Area Climate Zones 02, 03, 04, and 12.

### Abbreviations and Acronyms

<b>AHRI</b>	Air-Conditioning, Heating, And Refrigeration Institute	<b>HERS</b>	Home Energy Rating System
<b>AT</b>	Airtight	<b>HSPF</b>	Heating Season Performance Factor
<b>CEC</b>	California Energy Commission	<b>IC</b>	Insulation Contact
<b>CFA</b>	Conditioned Floor Area	<b>LED</b>	Light Emitting Diode
<b>CFL</b>	Compact Fluorescent Lamp	<b>NFRC</b>	National Fenestration Rating Council
<b>CRRC</b>	Cool Roof Rating Council	<b>mfd/mfr</b>	Manufactured/Manufacturer
<b>CZ</b>	California Climate Zone	<b>RCM</b>	Residential Compliance Manual (Title 24, Part 6)
<b>EER</b>	Energy Efficiency Ratio	<b>SEER</b>	Seasonal Energy Efficiency Ratio
<b>EF</b>	Energy Factor	<b>SHGC</b>	Solar Heat Gain Coefficient

### Minimum Energy Efficiency Requirements

Component	Minimum Requirement	2013 Standards Section(s)	How to Verify Efficiency of Installed Components
<b>Building Envelope</b>			
Ceiling/attic insulation	CF1R value or R-30, whichever is higher.	§150.0(a-d) RCM 3.9.6	For batts/blankets use R-value on packaging; For rigid sheets use R-value on product; For loose-fill insulation, compare installed depth/thickness with mfr specs on product packaging; For spray polyurethane foam use RCM Table 3-10.
Exterior wall cavity insulation	CF1R value or R-13 with 2x4 framing, R-19 with 2x6 framing, whichever is higher.	§150.0(a-d) RCM 3.9.6	
Exterior wall total insulation	CF1R value.	§150.0(a-d) RCM 3.9.6	
Raised floor insulation	CF1R value or R-19, whichever is higher.	§150.0(a-d) RCM 3.9.6	
Duct insulation (except those in conditioned space)	CF1R value or mandatory R-6, whichever is higher.	§150.0(m)4 110.8	R-value printed on outside of insulated flex duct.
Window U-factor	CF1R value.	Table 150.1-A	NFRC labels on installed products.
Skylight U-factor	CF1R value.	§150.0(q)	NFRC labels on installed products.
Window SHGC	CF1R value.	Table 150.1-A	NFRC labels on installed products.
Skylight SHGC	CF1R value.	Table 150.1-A	NFRC labels on installed products.
Cool roofing products	CF1R values.	Table 150.1-A	CRRC labels on roofing material packaging.

Component	Minimum Requirement	2013 Standards Section(s)	How to Verify Efficiency of Installed Components
<b>Building HVAC</b>			
Central air conditioners - split systems <45,000 Btu/h	CF1R values or SEER 14/EER 12.2, whichever are higher. HERS verification is required for higher-than-minimum values.	RCM Table 4-6	Obtain AHRI Certificate from installing contractor and compare AHRI equipment efficiency to those on the CF1R. If the CF1R shows higher-than-prescriptive values, collect a CF3R-MCH-26-H form from HERS rater.
Central air conditioners - package systems <45,000 Btu/h	CF1R values or SEER 14/EER 11.0, whichever are higher. HERS verification is required for higher-than-minimum values.	RCM Table 4-6	
Central air-source heat pumps, <65,000 Btu/h cooling capacity - heating efficiency	CF1R value or 8.0 HSPF for packaged systems, 8.2 HSPF for split systems, whichever is higher. HERS verification is required for higher-than-minimum values.	Table 150.1A RCM 4.2.1.2 RCM Table 4-3	
Central air-source heat pumps, <65,000 Btu/h cooling capacity - cooling efficiency	CF1R or 14 SEER for split systems, whichever is higher. HERS verification is required for higher-than-minimum values.	Table 150.1A RCM 4.3.1 RCM Table 4-6	
Whole-house fan	CF1R indicates whether it is required. If listed on CF1R, fans must move $\geq 2$ cfm/ft <sup>2</sup> CFA, and attic has required free vent area.	§150.1(c)12	Verify fan is listed in CEC Appliance Directory, and that it moves $\geq 2$ cfm /ft <sup>2</sup> CFA, and attic has $\geq$ one ft <sup>2</sup> net free vent area per 375 cfm of WHF airflow.
Local bathroom and kitchen exhaust fans	Mandatory: Energy Star labeled.	§150.0(o) RCM Chapter 4	Verify Energy Star labels on the fan housing or product box.
<b>Water Heating</b>			
Gas storage water heaters, $\leq 55$ gallons and 75 kbtu/hr input	CF1R value or mandatory Energy Factor, whichever is higher: If mfd before April 16, 2015, mandatory: $EF \geq 0.67 - (0.0019 \times V)$ . If mfd after April 16, 2015, mandatory: $EF \geq 0.675 - (0.0015 \times V)$ .	§110.1 §110.3 §150.1(c)8A RCM Table 5-1	Enter model no. from appliance nameplate into CEC Appliance Database and find equipment EF. Installed EF must be $\geq$ EF listed on CF1R.
Gas tankless water heaters, $\leq 200$ kbtu/hr input	CF1R value or mandatory Energy Factor, whichever is higher: If mfd before April 16, 2015, mandatory: $EF \geq 0.62$ . If mfd after April 15, 2015, mandatory: $EF \geq 0.82$ .	§150.1(c)8B RCM Table 5-1	
Water pipe insulation	For DHW systems with water temperatures 105-140°F, mandatory $\geq$ one inch insulation on pipes $\leq$ one inch diameter, and $\geq 1.5$ inches insulation on pipes over one inch diameter.	§120.3(a) Table 120.3-A §150.0(j)2 RCM 5.3.4	Verify that pipes have the required thickness of insulation for the pipe diameter.
<b>Lighting</b>			
Luminaires recessed in insulated ceilings	Mandatory: must be rated for zero clearance IC, certified AT, and be gasketed or caulked between the housing and ceiling.	RCM 3.8.1.J	Inspect luminaire housing for IC and AT labels, and adequate air sealing.