

# Nonresidential Interior Lighting – Alterations

Step 1: Applicable Lighting Alteration Sections <sup>A</sup>	Mandatory Requirements			Prescriptive Requirements	
Scope Classification <sup>1</sup>	Lighting Control Devices & Systems §110.9 <sup>B</sup>	Indoor Lighting Controls <sup>C</sup> §130.1	Acceptance Testing <sup>D</sup> §130.4	Calculated Lighting Power Density §140.6	Calculate Rated Power Reduction §141.0
Entire Luminaire Alteration <sup>2</sup>	Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ii				
	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	no
	Using Rated Power Reduction Method §141.0(b)2Iii				
Luminaire Component Modification <sup>3</sup>	Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ji				
	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	no
	Using Rated Power Reduction Method §141.0(b)2Jii				
Lighting Wiring Alterations <sup>4</sup>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	no

**Terms and Definitions**

- Exceptions to the Energy Standards include: (a) luminaire alterations or component modifications of portable luminaires, or those affixed to movable partitions, or excluded by §140.6(a)3; and (b) where only 2 luminaires in an enclosed space are affected; (c) when disturbance of asbestos is directly caused by the modification or alteration (unless the luminaire modifications are made in conjunction with asbestos abatement).
- Entire Luminaire Alteration includes: (a) removing and reinstalling a total of 10 percent or more of the existing luminaires; or (b) replacing or adding entire luminaires; or (c) adding, removing, or replacing walls or ceilings along with any redesign of the lighting system.
- Luminaire Component Modification includes: (a) replacing the ballasts or drivers and the associated lamps in the luminaire; or (b) permanently changing the light source of the luminaire; or (c) changing the optical system of the luminaire, where 70 or more existing luminaires are modified either on any single floor of a building or, where multiple tenants inhabit the same floor, in any single tenant space, in any single year. Lamp replacements alone and ballast replacements alone shall not be considered a modification of the luminaire provided that the replacement lamps or ballasts are installed and powered without modifying the luminaire. Note: Lighting shall not prevent or disable the operation of any multi-level, shut-off, or daylighting controls.

- Lighting Wiring Alteration includes: (a) adding circuit feeding luminaires; or (b) replace, modify, or relocate wiring between a switch or panelboard and luminaires; or (c) replace lighting control panels, panelboards, or branch circuit wiring. Exception to requirements: lighting wiring alterations made only for the addition of lighting controls.

**Notes**

- All sections listed in the table are applicable to the scope of work listed in the left hand column. Read over these sections carefully to determine what parts of each section pertain to the project. This Step 1 table is intended to be used in conjunction with the Step 2 table, below. Both should be read carefully.
- For additional equipment requirements, see Title 20.
- Controls requirements differ based on scope and lighting design. See the Step 2 table below for more information.
- Acceptance testing is not required for alterations of ≤ 20 controlled luminaires per §141.0(b)2I, §141.0(b)2J, and §141.0(b)2K.
- 50% reduction for office, retail and hotel occupancies. 35% reduction for all other occupancies.

Step 2: Lighting Control Requirements		Mandatory Requirements					
Scope Classification		Area Controls <sup>6</sup> §130.1(a)	Multi-Level Lighting Controls <sup>7</sup> §130.1(b)	Shut-OFF Controls <sup>8</sup> §130.1(c)	Automatic Daylighting Controls <sup>9</sup> §130.1(d)	Demand Responsive Controls <sup>10</sup> §130.1(e)	Secondary Daylit Zone Controls §140.6(d)
Entire Luminaire Alteration	≤ 85% of lighting power allowance > 85% of lighting power allowance	Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ii					no
		<b>YES</b>	<b>YES</b>	<b>YES</b>	no	no	no
		Using Rated Power Reduction Method <sup>F</sup> §141.0(b)2Iii					no
Luminaire Component Modification	≤ 85% of lighting power allowance > 85% of lighting power allowance	Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ji					no
		<b>YES</b>	<b>YES</b>	<b>YES</b>	no	no	no
		Using Rated Power Reduction Method <sup>F</sup> §141.0(b)2Jii					no
Lighting Wiring Alterations		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	no	no

**Terms and Definitions**

- §130.1(a) - Area Controls: All luminaires shall be functionally controlled with manually switched ON and OFF lighting controls. Each area enclosed by ceiling-height partitions shall be independently controlled.
- §130.1(b) - Multi-Level Lighting Controls: The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5W per ft<sup>2</sup> shall meet the requirements of §130.1(b) or if lighting power is ≤ 85% of allowance, the enclosed space must have a minimum of one step of 30-70%.
- §130.1(c) - Shut-OFF Controls: In addition to lighting controls installed to comply with §130.1(a) and (b), all installed indoor lighting shall be equipped with controls that meet the requirements of §130.1(c).

- §130.1(d) - Automatic Daylighting Controls: Any altered luminaires providing general lighting that are in or are partially in daylit zones shall meet the requirements of §130.1(d)2.
- §130.1(e) - Demand Responsive Controls: Only required in altered spaces > 10,000ft<sup>2</sup> where alteration changes area, occupancy types, or increases lighting power per Table 141.0-E.

**Notes**

- Rated Power Reduction: Any multi-level, Shut-OFF or daylighting controls already in place must remain functional.

# For More Information

## Primary Sources

- Energy Standards Section 110.9 – Mandatory Requirements for Lighting Control Devices and Systems, Ballasts, and Luminaires [energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1109mandatoryrequirementsforlightingcontroldevicesandsyst.htm](http://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1109mandatoryrequirementsforlightingcontroldevicesandsyst.htm)
- Energy Standards Section 130.1 – Mandatory Indoor Lighting Controls [energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1301mandatoryindoorlightingcontrols.htm](http://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1301mandatoryindoorlightingcontrols.htm)
- Energy Standards Section 130.4 – Lighting Control Acceptance and Installation Certificate Requirements [energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1304lightingcontrolacceptanceandinstallationcertificatere.htm](http://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1304lightingcontrolacceptanceandinstallationcertificatere.htm)
- Energy Standards Section 140.6 – Prescriptive Requirements for Indoor Lighting [energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1406prescriptiverequirementsforindoorlighting.htm](http://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/section1406prescriptiverequirementsforindoorlighting.htm)
- Energy Standards Section 141.0 – Additions, Alterations, & Repairs to Existing Buildings That Will Be Nonresidential, High-Rise Residential, & Hotel/Motel Occupancies And To Existing Outdoor Lighting For These Occupancies And To Internally And Externally Illuminated Signs [energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/sec1410additionalterationsrepairstoexistingbuildingsthatwillben.htm](http://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/sec1410additionalterationsrepairstoexistingbuildingsthatwillben.htm)
- 2015 Title 20 Appliance Efficiency Regulations [energy.ca.gov/2015publications/CEC-400-2015-021/CEC-400-2015-021.pdf](http://energy.ca.gov/2015publications/CEC-400-2015-021/CEC-400-2015-021.pdf)
  - Updated standards adopted since the publication of the 2015 Appliance Efficiency Regulations are available at [govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I8F8F3BC0D44E11DEA95CA4428EC25FA0&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](http://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I8F8F3BC0D44E11DEA95CA4428EC25FA0&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default))

## California Energy Commission Information & Services

- Energy Standards Hotline: 1-800-772-3300 (Free) or [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)
- Online Resource Center: [energy.ca.gov/title24/orc/](http://energy.ca.gov/title24/orc/)
  - The Energy Commission’s main web portal for Energy Standards, including information, documents, and historical information

## Additional Resources

- California Lighting Technology Center (CLTC) Guides:
  - Nonresidential Lighting: What’s New in the 2016 Title 24, Part 6 Code? [cltc.ucdavis.edu/publication/2016-title-24-code-changes-nonresidential](http://cltc.ucdavis.edu/publication/2016-title-24-code-changes-nonresidential)
- Energy Code Ace: [EnergyCodeAce.com](http://EnergyCodeAce.com)
  - An online “one-stop-shop” providing free resources and training to help appliance and building industry professionals decode and comply with Title 24, Part 6 and Title 20. The site is administered by California’s investor-owned utilities. *Of special interest:* Fact Sheets ([energycodeace.com/content/resources-fact-sheets/](http://energycodeace.com/content/resources-fact-sheets/))
    - Nonresidential Lighting Mandatory Controls
    - Nonresidential Lighting Controls for Credit
    - Nonresidential Daylighting and Daylighting ControlsPlease register with the site and select an industry role for your profile in order to receive messages about all our free offerings!



This program is funded by California utility customers under the auspices of the California Public Utilities Commission and in support of the California Energy Commission. © 2016 Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Gas Company and Southern California Edison. All rights reserved, except that this document may be used, copied, and distributed without modification. Neither PG&E, Sempra, nor SCE — nor any of their employees makes any warranty, express or implied; or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any data, information, method, product, policy or process disclosed in this document; or represents that its use will not infringe any privately-owned rights including, but not limited to patents, trademarks or copyrights.