



CALIFORNIA ENERGY COMMISSION

Proposed 2013 Residential Lighting Standards

Presented on May 24, 2011

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If you have comments regarding
proposed 2013 Residential Lighting Standards
please send them to:

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by June 7, 2011



Goals

- Simplify
- Clarify
- Rearrange
- Make consistent
- Incorporate CASE proposals
- Reach conclusions with stakeholders



Residential Lighting Standards § 150(k)

- **Determine Efficacy for ALL Installed luminaires**
 - **Calculate Kitchen Wattage**

2008

2013

- Determine if each and every installed luminaire in the house is high efficacy or low efficacy
- Calculate installed wattage only in Kitchens



Residential Lighting Standards § 150(k)

2013

Measures proposed at April 4, 2011 Staff Workshop which have been abandoned:

- We have dropped the proposal to restrict medium screw-based sockets for recessed downlights
- We have dropped the proposal to restrict medium screw-based sockets for chandeliers, pendants, and sconces in hallways



Rules for Determining Wattage § 130(c)

2008	2013
<ul style="list-style-type: none">• Title 24 is a luminaire Standard, it is not a lamp Standard<ul style="list-style-type: none">▶ An incandescent luminaire is an incandescent luminaire• Standards do not recognize screw-based adaptors<ul style="list-style-type: none">▶ 2008 Compliance Manuals are very clear that Standards do not recognize “permanent” adaptors▶ Clarifying language added to 2013 Standards that “permanent” adaptors are not recognized	



Residential Lighting Standards § 150(k)

Definition of High Efficacy and Low Efficacy Luminaires

2008	2013
<ul style="list-style-type: none">• High efficacy = 30, 40, 50, 60 Lumens per watt according to Table 150-C	<ul style="list-style-type: none">• Table 150-C has default list of high efficacy and low efficacy luminaires
<ul style="list-style-type: none">• High and low efficacy defined in §150(k)	
<ul style="list-style-type: none">• LED Certified to JA-8 to be classified as high efficacy• LED not certified shall be classified as low efficacy	



High Efficacy Table

2013

Luminaires manufactured, designed and rated for use with only the following lighting technologies:

- Pin-based fluorescent lamps
- Pulse-start metal halide lamps
- High-pressure sodium lamps
- GU-24 sockets rated only for LED lamps
- GU-24 sockets rated for compact fluorescent lamps which are not recessed luminaires
- LED light sources certified to the Energy Commission per JA-8
- Luminaire housings rated by manufacture only for LED modules
- Induction lamps



Low Efficacy Table

2013

Luminaires manufactured, designed or rated for use with any of the following lighting technologies:

- Line-voltage sockets capable of operating incandescent lamps of any type
- Low-voltage sockets capable of operating incandescent lamps of any type
- Screw-base CFL and LED installed in an incandescent luminaire
- Mercury vapor lamps
- Track lighting
- LED not certified to the Energy Commission
- Modular components allowing high-efficacy to low efficacy conversions
- Blank electrical boxes
- Adaptors shall not be used to convert an incandescent to something else

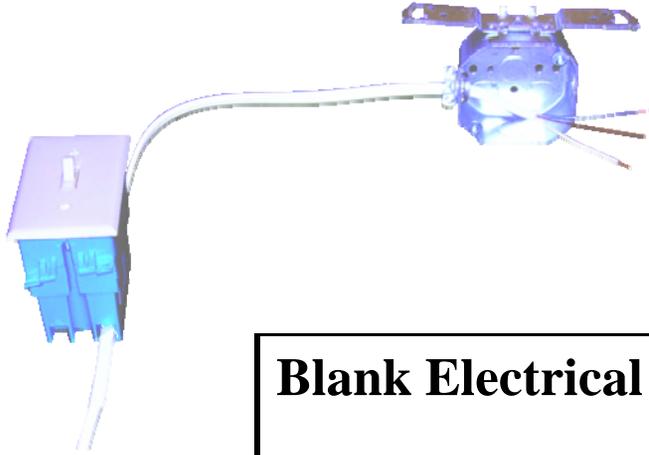


LED

2008	2013
<ul style="list-style-type: none">• Only LED certified to Energy Commission, by manufacturer, according to JA-8, may be classified as high efficacy• LED not certified shall be classified low efficacy, regardless of actual efficacy	



Residential Lighting Standards § 150(k)



Blank Electrical Boxes in Kitchen

2008

2013

- Shall be calculated and treated as 180 watts of low efficacy lighting



Residential Lighting Standards § 150(k)

Electronic ballasts

2008

2013

- Required for lamps rated 13 watts or greater





Residential Lighting Standards § 150(k)

Permanently Installed Night Lights and Night Lights Integral to Permanently Installed Luminaire or Exhaust Fan

2008	2013
<ol style="list-style-type: none">1. Shall contain only high efficacy lamps with no line voltage lamp holder or2. Shall consume no more than 5 watts with no screw-base lamp holder.	<ul style="list-style-type: none">• Shall consume no more than 5 watts





Residential Lighting Standards § 150(k)

Exhaust Fans	
2008	2013
<ul style="list-style-type: none">Bathroom exhaust fans	<ul style="list-style-type: none">All exhaust fans <p>Exception: Manufactured kitchen exhaust hoods</p>
<ul style="list-style-type: none">Lighting subject to lighting StandardsFan housing not required to be certified airtightGasket or caulk required between exhaust fan housing and ceiling.	





Residential Lighting Standards § 150(k)

Switching Requirements

2008

2013

- High efficacy / low efficacy lighting systems must be separately switched
- Exhaust fans switched separately from lighting.
- All controls permit manual on and off
- No override of dimmer or vacancy sensor installed to comply with § 150(k)
- Controls certified per § 119





Residential Lighting Standards § 150(k)

Switching Requirements

2013

- EMCS may be used as dimmer – Shall meet functionality of dimmer in accordance with §119, acceptance tested according to § 134
- EMCS may be used as vacancy sensor – Shall meet functionality of vacancy sensor in accordance with § 119, acceptance testing according to § 134
- Multi-scene programmable may be used as dimmer – Shall meet functionality of dimmer in accordance with § 119



Residential Lighting Standards § 150(k)

Recessed luminaires in insulated ceilings

Zero-Clearance IC

2008

2013

- Must be approved for zero-clearance insulation cover (IC)





Residential Lighting Standards § 150(k)

Recessed luminaires in insulated ceilings

Airtight

2008

2013

- Must be certified airtight (ASTM E283)
- Sufficiently airtight to prevent the flow of heated or cooled air between conditioned and unconditioned spaces
- Gasket or caulk between luminaire and ceiling
- All air leak paths through luminaire assembly or ceiling opening must be sealed



Residential Lighting Standards § 150(k)

Recessed luminaires in insulated ceilings continued

2008

2013

- To qualify as high efficacy ballasts shall be certified to comply with § 119(n)
- Must allow ballast maintenance and replacement readily accessible from below the ceiling without cutting holes in ceiling.



Residential Lighting Standards § 150(k)

Kitchen Lighting Wattage

2008

2013

- $\geq 50\%$ of installed wattage must be high efficacy
- Additional low efficacy wattage may be available under certain conditions (*see next 2 slides*)



Residential Lighting Standards § 150(k)

**Additional Low Efficacy Kitchen Lighting Wattage
Exempt from 50% High Efficacy Requirement
Only When All Conditions Have Been Met
(See next slide)**

2008

2013

- Up to 50 watts per dwelling units $\leq 2,500 \text{ ft}^2$
- Up to 100 watts per dwelling units $> 2,500 \text{ ft}^2$



Residential Lighting Standards § 150(k)

All Conditions Required to qualify for Additional Kitchen Low Efficacy Lighting Wattage

2008	2013
<ol style="list-style-type: none">1. All low efficacy luminaires in Kitchen controlled by vacancy sensor, dimmer, EMCS, or multi-scene programmable control, and2. All luminaires in garages, laundry, closets > 70 ft², utility rooms must be high efficacy AND also must be controlled by a vacancy sensor	<ul style="list-style-type: none">• All kitchen lighting controlled by vacancy sensors or dimmers, in addition to meeting other control requirements.• Standards changed in 2013 for garages, laundry, and utility rooms.



Residential Lighting Standards § 150(k)

Lighting Internal to Cabinets

2008

2013

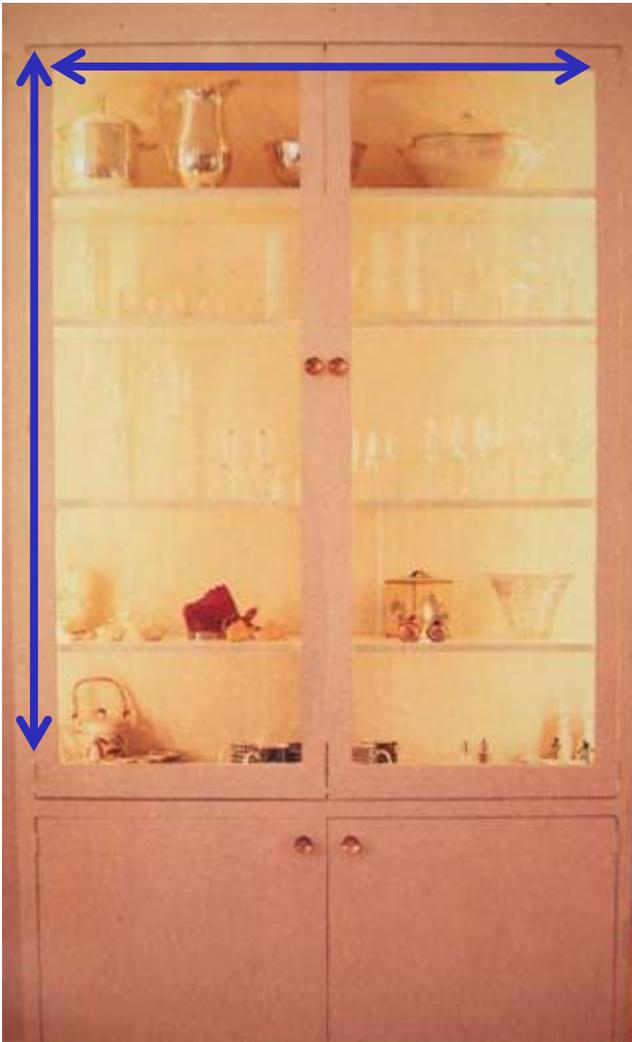
- NOT considered part of the kitchen lighting for calculating 50%
- Shall use no more than 20 W/ linear foot of illuminated cabinet





Internally Illuminated Cabinets

- Width of the cabinet section or
- Height of the glazing per cabinet section, or
- One vertical length for every 40 horizontal inches





Residential Lighting Standards § 150(k)

Bathrooms, Garages, Closets, Laundry Rooms, and Utility Rooms

2008	2013
<ul style="list-style-type: none">• Bathrooms• Garages• Closets• Laundry Rooms• Utility Rooms	<ul style="list-style-type: none">• Garages• Laundry Rooms• Utility Rooms
All installed lighting must be high efficacy OR controlled by a vacancy sensor	All installed lighting must be high efficacy AND controlled by a vacancy sensor
Low efficacy luminaires allowed in closets less than 70 ft ²	Closets now classified with different group of rooms.



Residential Lighting Standards § 150(k)

Bathrooms	
2008	2013
All installed lighting must be high efficacy, or controlled by a vacancy sensor	
	Minimum one high efficacy in each bathroom



Residential Lighting Standards § 150(k)

All other rooms	
Any room that is not a Kitchen, Bathroom, Garage, Laundry Room, or Utility Room	
2008	2013
All installed lighting must be high efficacy, controlled by a vacancy sensor, or controlled by a dimmer	
<ul style="list-style-type: none">Lighting in detached storage buildings less than 1000 square feet located on a residential site not required to comply.	
<ul style="list-style-type: none">Closets were grouped in different subsection in 2008	EXCEPTION: Closets < 70 square feet



Residential Lighting Standards § 150(k)

Outdoor lighting attached to a building

2008	2013
<ul style="list-style-type: none">• Addressed single-family and multi-family in same subsection	<ul style="list-style-type: none">• Addresses single-family and multi-family in different subsections
<ul style="list-style-type: none">• Caused some confusion	<ul style="list-style-type: none">• For clarity



Residential Lighting Standards § 150(k)

SINGLE FAMILY - Outdoor lighting attached to a building

2008

2013

- All outdoor lighting attached to buildings must be high efficacy, or may be low efficacy if controlled by a motion sensor in addition to being controlled by one of the following three methods
 - Photocontrol not having an override or bypass switch, or
 - Astronomical time clock not having an override or bypass switch, or
 - Energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on.
-
- EMCS must meet functionality of an astronomical time clock in accordance with § 119 and acceptance tested in accordance with § 134



Residential Lighting Standards § 150(k)

MULTI-FAMILY - Outdoor lighting attached to a building	
2008	2013
<ul style="list-style-type: none">For low-rise multi-family residential buildings, outdoor lighting for private patios, entrances, balconies, and porches:	
	<ul style="list-style-type: none">For residential parking lots and residential carports < 8 vehicles per site
<ul style="list-style-type: none">Meet the same requirements as single-family outdoor lighting attached to a building	
	<ul style="list-style-type: none">Or meet all nonresidential outdoor lighting requirements



Residential Lighting Standards § 150(k)

Residential parking lots and garages for 8 or more vehicles

2008

2013

Must meet the lighting requirements for nonresidential buildings, which include:

- Automatic shutoff controls
- Bi-level switching
- > 175W cutoff
- Minimum efficacy or motion sensor
- Lighting power allowances per Lighting Zone (LZ)



Residential Lighting Standards § 150(k)

Residential multi-family site lighting

2013

For low-rise multi-family residential buildings with four or more dwelling units:

- Site lighting shall meet nonresidential outdoor lighting requirements
- This does not include outdoor lighting for private patios, entrances, balconies, and porches, which is covered by a different subsection



Residential Lighting Standards § 150(k)

Outdoor Lighting for High-rise Residential Dwelling Units and Hotel/Motel Guest Rooms



2008

2013

- If separately controlled from the inside a high-rise residential dwelling unit or guest room shall comply with residential lighting Standards



Residential Lighting Standards § 150(k)

Common Areas of low-rise residential buildings with 4 or more dwelling units

2008

- All buildings treated the same regardless of % of common areas compared to % of dwelling units

2013

- Residential buildings with $\leq 20\%$ common area
- Residential buildings with $> 20\%$ common area



Residential Lighting Standards § 150(k)

Common Areas of low-rise residential buildings with 4 or more dwelling units

2008

2013

- Where common areas $\leq 20\%$ of floor area in a single building:
- All hardwired lighting in that building must be high efficacy or controlled by an occupant sensor.



Residential Lighting Standards § 150(k)

Common Areas of low-rise residential buildings with 4 or more dwelling units

2008

2013

- Where common areas $> 20\%$ of floor area in a single building:

- All hardwired lighting in that building must be high efficacy or controlled by an occupant sensor.

- Shall comply with nonresidential indoor lighting requirements, and
- Lighting in corridors and stairwells reduced 50% with occupancy sensors



Residential Lighting Standards § 150(k)

Internally illuminated address signs	
2008	2013
<ul style="list-style-type: none">• Comply with nonresidential sign requirements, or	
<ul style="list-style-type: none">• No medium screw base sockets, and ≤ 5 watts	<ul style="list-style-type: none">• ≤ 5 watts





Questions?