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Regulatory Advisory

March 30, 2017

APPLIANCE EFFICIENCY REGULATIONS FOR LAMPS: EFFECTIVE DATES

Three California Appliance Efficiency Regulations related to lighting will be effective for lamps manufactured on or after January 1, 2018. These regulations govern the lamps that can be legally sold or offered for sale in the state of California. In addition to the requirements discussed below, all other relevant provisions in Title 20, Sections 1601 to 1609 are applicable.

I. State-Regulated Light-Emitting Diode (LED) Lamp

A state-regulated LED lamp has a base that is E12, E17, E26, or GU-24. State-regulated LED lamps include retrofit kits, which are products designed to retrofit existing recessed can housings and contain a base that is E12, E17, E26, or GU-24. State-regulated LED lamps are further defined by additional characteristics such as maximum lumen output and correlated color temperature. The complete definition of state-regulated LED lamp is found in Title 20, Section 1602(k).

State-regulated LED lamps manufactured on or after January 1, 2018, and having a lumen output of 150 lumens or greater for candelabra bases or 200 lumens or greater for other bases, shall meet the requirements found in Title 20, Section 1605.3(k)(2) Table K-14 and Section 1605.3(k)(2)(C). For reference, these requirements are:

Requirements for State-Regulated LED Lamps Effective January 1, 2018

Measurement	Minimum Requirement
Compliance Score (<i>Efficacy</i> + [2.3 x <i>CRl</i>])	282
Initial Efficacy	68 lumens per watt
Color target and color consistency	Table 1 of Annex B of ANSI C78.377-2015
Color rendering index (Ra)	82
Individual color scores (R1-R8)	72
Power factor	0.7
Minimum Rated life	10,000 hours
Light distribution	<ul style="list-style-type: none"> • A shapes: omnidirectional light distribution requirements in ENERGY STAR Product Specification for Lamps Version 2.0 (December 2015) • B, BA, C, CA, F, or G shapes: decorative light distribution requirements in ENERGY STAR Product Specification for Lamps Version 1.1 (August 2014) • Other shapes: none

In addition, marking requirements apply as described in Title 20, Section 1607.

II. State-Regulated Small Diameter Directional Lamp (SDDL)

A state-regulated SDDL is a non-tubular directional lamp with a diameter of less than or equal to 2.25 inches that is capable of operating at 12 volts, 24 volts, or 120 volts. State-regulated SDDLs are further defined by additional characteristics such as base, lumen output, and rated life. SDDLs may be incandescent, halogen, or LED. The complete definition of state-regulated SDDL is found in Title 20, Section 1602(k).

State-regulated SDDLs manufactured on or after January 1, 2018, shall meet the requirements in Title 20, Section 1605.3(k)(3). For reference, these requirements are:

Requirements for State-Regulated SDDLs Effective January 1, 2018	
Measurement	Minimum Requirement
Initial Efficacy	Either: <ul style="list-style-type: none">80 lumens per watt, or70 lumens per watt and a minimum compliance score (efficacy + CRI) of 165
Minimum Rated life	25,000 hours

III. State-Regulated General Service Lamp

The definition of state-regulated general service lamp is identical to the definition of federally-regulated general service lamp found in Title 20, Section 1602(k)¹. State-regulated general service lamps may be incandescent, halogen, compact fluorescent, or LED.

State-regulated general service lamps manufactured on or after January 1, 2018, shall meet the requirements in Title 20, Section 1605.3(k)(2) Table K-12. For reference, these requirements are:

Requirements for State-Regulated General Service Lamps Effective January 1, 2018	
Measurement	Minimum Requirement
Initial Efficacy	45 lumens per watt
Minimum Rated Life	1,000 hours

For more information

To obtain a copy of the regulations or other related compliance assistance documents, visit the Appliance Efficiency Program website at <http://www.energy.ca.gov/appliances>. Additional questions may be addressed by calling the Appliances Title 20 Compliance Assistance Call Center, toll free inside California at (888) 838-1467, or outside California at (916) 651-7100, or by emailing appliances@energy.ca.gov.

¹ All relevant definitions, such as those for federally-regulated general service incandescent lamp and federally-regulated incandescent reflector lamp are those that are in Title 20, Section 1602(k). The definitions recently adopted by the U.S. Department of Energy and published in the Federal Register on January 19, 2017, are not applicable to the California Appliance Efficiency Regulations until they are adopted by the California Energy Commission in a rulemaking.

"Specialty application mercury vapor lamp ballast" means a mercury vapor lamp ballast that:

(1) is designed and marketed for operation of mercury vapor lamps used in quality inspection, industrial processing, or scientific use, including fluorescent microscopy and ultraviolet curing; and

(2) in the case of a specialty application mercury vapor lamp ballast, the label of which:

(A) provides that the specialty application mercury vapor lamp ballast is "For specialty applications only, not for general illumination"; and

(B) specifies the specific applications for which the ballast is designed.

"State-regulated general service incandescent lamp" means a standard incandescent or halogen type lamp that: is intended for general service applications; has a medium screw base; has a wattage rating no less than 25 watts and no greater than 150 watts; has a rated voltage range at least partially within 110 and 130 volts; has a A-15, A-19, A-21, A-23, A-25, PS-25, PS-30, BT-14.5, BT-15, CP-19, TB-19, CA-22, or equivalent shape as defined in ANSI C78.20-2003; and has a bulb finish of the frosted, clear, or soft white type. The following incandescent lamps are not state-regulated general service incandescent lamps: appliance, black light, bug, colored, infrared, left-hand thread, marine, marine signal service, mine service, plant light, reflector, rough service, shatter resistant, sign service, silver bowl, showcase, three-way, traffic signal, and vibration service or vibration resistant.

"State-regulated incandescent reflector lamp" means a lamp that is not colored or designed for rough or vibration service applications, that contains an inner reflective coating on the outer bulb to direct the light, a E26 medium screw base, that has a rated voltage or voltage range that lies at least partially within 115 to 130 volts, and that is either:

(1) a BR or ER bulb shape with a diameter 2.25 inches or more;

(2) a R, PAR, BR or similar bulb shape and which has a diameter of 2.25 to 2.75 inches.

"State-regulated Light Emitting Diode (LED) lamp" means a lamp capable of producing light with Duv between -0.012 and 0.012, and that has an E12, E17, E26, or GU-24 base, including LED lamps that are designed for retrofit within existing recessed can housings that contain one of the preceding bases. State-regulated LED lamp does not include a lamp with a brightness of more than 2,600 lumens or a lamp that cannot produce light with a correlated color temperature between 2200 K and 7000 K.

"State-regulated small diameter directional lamp" means a directional lamp that meets all of the following criteria:

1. Capable of operating at 12 volts, 24 volts, or 120 volts;
2. Has an ANSI ANSLG C81.61-2009 (R2014) compliant pin base or E26 base;
3. Is a non-tubular directional lamp with a diameter of less than or equal to 2.25 inches;

4. Has a lumen output of less than or equal to 850 lumens, or has a wattage of 75 watts or less; and

5. Has a rated life greater than 300 hours.

State-regulated small diameter directional lamp includes incandescent filament, LED, and any other lighting technology that falls within this definition. State-regulated small diameter directional lamp does not include directional lamps with an E26 base that utilize light emitting diodes (LEDs) and are covered under the definition of state-regulated Light Emitting Diode Lamps.

“Three-way lamp” includes an incandescent lamp that employs two filaments, operated separately and in combination, to provide three light levels. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a three-way lamp.

“U-shaped lamp” means a tubular U-shaped fluorescent lamp with a medium bi-pin base with a nominal overall length between 22 and 25 inches and a rated wattage of 28 or more.

“Vibration service lamp” means a lamp that:

(1) has filament configurations that are C-5, C-7A, or C-9, as listed in Figure 6-12 of the 9th Edition of the IES Lighting Handbook or similar configurations;

(2) has a maximum wattage of 60 watts;

(3) is sold at retail in packages of two lamps or less; and

(4) is designated and marketed specifically for vibration service or vibration-resistant applications with:

(A) the designation appearing on the lamp packaging; and

(B) marketing materials that identify the lamp as being vibration service only.

“Voltage range” means a band of operating voltages as marked on an incandescent lamp, indicating that the lamp is designed to operate at any voltage within the band.

(I) Emergency Lighting and Self-Contained Lighting Controls.

“Astronomical time-switch control” means an automatic time-switch control device capable of controlling lighting based on the time of day and astronomical events such as sunset and sunrise, accounting for geographic location and date of the year.

“Automatic daylight control” means a self-contained lighting control device that automatically adjusts lighting levels by using one or more photosensors to detect changes in daylight illumination and then changing the electric lighting level in response to the changes in daylight.

“Automatic time-switch control” means a self-contained lighting control device that controls lighting based on the time of day.

“Average Luminance” means the arithmetic mean of all points measured on a surface.

(C) State-regulated LED lamps with lumen output of 150 lumens or greater for candelabra bases, or 200 lumens or greater for other bases, and manufactured on or after January 1, 2018 shall have:

(1) A color point that meets the requirements in Table 1 of Annex B of ANSI C78.377-2015 for color targets and color consistency.

(2) A CRI (Ra) of 82 or greater.

(3) Individual color scores of R1, R2, R3, R4, R5, R6, R7, and R8 of 72 or greater.

(4) A power factor of 0.7 or greater.

(5) A rated life of 10,000 hours or greater as determined by the lumen maintenance and time to failure test procedure.

(6) State-regulated LED lamps that have an ANSI standard lamp shape of A shall meet the omnidirectional light distribution requirements of ENERGY STAR's Product Specification for Lamps Version 2.0 (December 2015).

(7) State-regulated LED lamps that have an ANSI standard lamp shape of B, BA, C, CA, F, or G shall meet the decorative light distribution requirements of ENERGY STAR's Product Specification for Lamps Version 1.1 (August 2014).

(D) In addition to the requirements in section 1605.3(k)(2)(C), state-regulated LED lamps manufactured on or after July 1, 2019 shall have a standby mode power of 0.2 watts or less.

Table K-14
Standards for State-regulated LED Lamps

<i>Effective Date</i>	<i>Minimum Compliance Score</i>	<i>Minimum Efficacy Lumens Per Watt</i>
January 1, 2018	282	68
July 1, 2019	297	80
The compliance score shall be calculated as the sum of the efficacy and 2.3 times the CRI of a lamp.		

(3) State-regulated Small Diameter Directional Lamps. State-regulated small diameter directional lamps manufactured on or after January 1, 2018 must have a rated life of 25,000 hours or greater as determined by the lumen maintenance and time to failure test procedure and meet one of the following requirements:

(A) have luminous efficacy of at least 80 lumens per watt.

(B) have a minimum luminous efficacy of 70 lumens per watt or greater and a minimum compliance score of 165 or greater, where compliance is calculated as the sum of the luminous efficacy and CRI.