

**DOCKETED**

<b>Docket Number:</b>	17-AAER-07
<b>Project Title:</b>	General Service Lamps
<b>TN #:</b>	224619
<b>Document Title:</b>	Handout from General Service Lamps Staff Workshop August 28 2018
<b>Description:</b>	Handout for draft proposed regulatory language provided at August 28, 2018, staff workshop on General Service Lamps (Expanded Scope). Identical to Chapter 10 in draft staff report.
<b>Filer:</b>	Patrick Saxton
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	8/28/2018 4:37:13 PM
<b>Docketed Date:</b>	8/28/2018

# CHAPTER 10:

## Proposed Regulatory Language

---

Proposed new language appears as underline (example) and proposed deletions appear as ~~example~~. Existing language appears as plain text. Three dots or “...” represents the substance of the regulations that exists between the proposed language and current language.

### Section 1602. Definitions.

...[skipping (a)-(j)]

#### (k) Lamps.

**(1) Definitions for General Service Lamps sold before January 1, 2020, and for all other lamps.**

...[skipping Appliance Lamp through Voltage Range]

**(2) Definitions for General Service Lamps sold on or after January 1, 2020, and Low-Lumen Lamps manufactured on or after January 1, 2020.**

“Black light lamp” means a lamp that is designed and marketed as a black light lamp and is an ultraviolet lamp with the highest radiant power peaks in the UV-A band (315 to 400 nm) of the electromagnetic spectrum.

“Bug lamp” means a lamp that is designed and marketed as a bug lamp, has radiant power peaks above 550 nm on the electromagnetic spectrum, and has a visible yellow coating.

“Colored “ means a colored fluorescent lamp, a colored incandescent lamp, or a lamp designed and marketed as a colored lamp with either of the following characteristics (if multiple modes of operation are possible [such as variable CCT], either of the below characteristics must be maintained throughout all modes of operation): (1) A CRI less than 40, as determined according to the method set forth in CIE Publication 13.3 (incorporated by reference; see 10 CFR 430.3); or (2) A CCT less than 2,500K or greater than 7,000K.

“Designed and marketed” means exclusively designed to fulfill the indicated application and, when distributed in commerce, designated and marketed solely for that application, with the designation prominently displayed on the packaging and all publicly available documents (e.g., product literature, catalogs, and packaging labels). This definition is applicable to terms related to the following covered lighting products: Fluorescent lamp ballasts; fluorescent lamps; general service fluorescent lamps; general service incandescent lamps; general service lamps; incandescent lamps; incandescent reflector lamps; medium base compact fluorescent lamps; and specialty application mercury vapor lamp ballasts.

“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 lumen range of not less than 310 lumens and not more than 2,600 lumens or, in the case of a modified spectrum lamp, not less than 232 lumens and not more than 1,950 lumens; and is capable of being

operated at a voltage range at least partially within 110 and 130 volts; however this definition does not apply to the following incandescent lamps—

- (1) An appliance lamp;
- (2) A black light lamp;
- (3) A bug lamp;
- (4) A colored lamp;
- (5) A G shape lamp with a diameter of 5 inches or more as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3);
- (6) An infrared lamp;
- (7) A left-hand thread lamp;
- (8) A marine lamp;
- (9) A marine signal service lamp;
- (10) A mine service lamp;
- (11) A plant light lamp;
- (12) An R20 short lamp;
- (13) A sign service lamp;
- (14) A silver bowl lamp;
- (15) A showcase lamp; and
- (16) A traffic signal lamp.

“General service lamp” means a lamp that has an ANSI base; is able to operate at a voltage of 12 volts or 24 volts, at or between 100 to 130 volts, at or between 220 to 240 volts, or of 277 volts for integrated lamps (as defined in this section), or is able to operate at any voltage for non-integrated lamps (as defined in this section); has an initial lumen output of greater than or equal to 310 lumens (or 232 lumens for modified spectrum general service incandescent lamps) and less than or equal to 3,300 lumens; is not a light fixture; is not an LED downlight retrofit kit; and is used in general lighting applications. General service lamps include, but are not limited to, general service incandescent lamps, compact fluorescent lamps, general service light-emitting diode lamps, and general service organic light-emitting diode lamps. General service lamps do not include:

- (1) Appliance lamps;
- (2) Black light lamps;
- (3) Bug lamps;
- (4) Colored lamps;
- (5) G shape lamps with a diameter of 5 inches or more as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3);
- (6) General service fluorescent lamps;

(7) High intensity discharge lamps;

(8) Infrared lamps;

(9) J, JC, JCD, JCS, JCV, JCX, JD, JS, and JT shape lamps that do not have Edison screw bases;

(10) Lamps that have a wedge base or prefocus base;

(11) Left-hand thread lamps;

(12) Marine lamps;

(13) Marine signal service lamps;

(14) Mine service lamps;

(15) MR shape lamps that have a first number symbol equal to 16 (diameter equal to 2 inches) as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3), operate at 12 volts, and have a lumen output greater than or equal to 800;

(16) Other fluorescent lamps;

(17) Plant light lamps;

(18) R20 short lamps;

(19) Reflector lamps (as defined in this section) that have a first number symbol less than 16 (diameter less than 2 inches) as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3) and that do not have E26/E24, E26d, E26/50x39, E26/53x39, E29/28, E29/53x39, E39, E39d, EP39, or EX39 bases;

(20) S shape or G shape lamps that have a first number symbol less than or equal to 12.5 (diameter less than or equal to 1.5625 inches) as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3);

(21) Sign service lamps;

(22) Silver bowl lamps;

(23) Showcase lamps;

(24) Specialty MR lamps;

(25) T shape lamps that have a first number symbol less than or equal to 8 (diameter less than or equal to 1 inch) as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3), nominal overall length less than 12 inches, and that are not compact fluorescent lamps (as defined in this section);

(26) Traffic signal lamps.

“General service light-emitting diode (LED) lamp” means an integrated or non-integrated LED lamp designed for use in general lighting applications (as defined in this section) and that uses light-emitting diodes as the primary source of light.

“General service organic light-emitting diode (OLED) lamp” means an integrated or non-integrated OLED lamp designed for use in general lighting applications (as defined in this section) and that uses organic light-emitting diodes as the primary source of light.

“Infrared lamp” means a lamp that is designed and marketed as an infrared lamp; has its highest radiant power peaks in the infrared region of the electromagnetic spectrum (770 nm to 1 mm); has a rated wattage of 125 watts or greater; and which has a primary purpose of providing heat.

“Integrated lamp” means a lamp that contains all components necessary for the starting and stable operation of the lamp, does not include any replaceable or interchangeable parts, and is connected directly to a branch circuit through an ANSI base and corresponding ANSI standard lamp-holder (socket).

“LED Downlight Retrofit Kit” means a product designed and marketed to install into an existing downlight, replacing the existing light source and related electrical components, typically employing an ANSI standard lamp base, either integrated or connected to the downlight retrofit by wire leads, and is a retrofit kit. LED downlight retrofit kit does not include integrated lamps or non-integrated lamps.

“Left-hand thread lamp” means a lamp with direction of threads on the lamp base oriented in the left-hand direction.

“Light fixture” means a complete lighting unit consisting of light source(s) and ballast(s) or driver(s) (when applicable) together with the parts designed to distribute the light, to position and protect the light source, and to connect the light source(s) to the power supply.

“Low-lumen lamp” means a lamp that has a lumen output of 150 lumens or greater and less than 310 lumens and otherwise meets the definition of a general service lamp.

“Marine lamp” means a lamp that is designed and marketed for use on boats and can operate at or between 12 volts and 13.5 volts.

“Marine signal service lamp” means a lamp that is designed and marketed for marine signal service applications.

“Mine service lamp” means a lamp that is designed and marketed for mine service applications.

“Non-integrated lamp” means a lamp that is not an integrated lamp.

“Other fluorescent lamp” means low pressure mercury electric-discharge sources in which a fluorescing coating transforms some of the ultraviolet energy generated by the mercury discharge into light and include circline lamps and include double-ended lamps with the following characteristics: Lengths from one to eight feet; designed for cold temperature applications; designed for use in reprographic equipment; designed to produce radiation in the ultra-violet region of the spectrum; impact-resistant; reflectorized or aperture; or a CRI of 87 or greater.

“Pin base lamp” means a lamp that uses a base type designated as a single pin base or multiple pin base system.

“Plant light lamp” means a lamp that is designed to promote plant growth by emitting its highest radiant power peaks in the regions of the electromagnetic spectrum that promote photosynthesis: Blue (440 nm to 490 nm) and/or red (620 to 740 nm), and is designed and marketed for plant growing applications.

“Reflector lamp” means a lamp that has an R, PAR, BPAR, BR, ER, MR, or similar bulb shape as defined in ANSI C78.20-2003 (incorporated by reference; see 10 CFR 430.3) and ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3) and is used to provide directional light.

“Showcase lamp” means a lamp that has a T shape as specified in ANSI C78.20-2003 (incorporated by reference; see 10 CFR 430.3) and ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3), is designed and marketed as a showcase lamp, and has a maximum rated wattage of 75 watts.

“Sign service lamp” means a vacuum type or gas-filled lamp that has sufficiently low bulb temperature to permit exposed outdoor use on high-speed flashing circuits, is designed and marketed as a sign service lamp, and has a maximum rated wattage of 15 watts.

“Silver bowl lamp” means a lamp that has an opaque reflective coating applied directly to part of the bulb surface that reflects light toward the lamp base and that is designed and marketed as a silver bowl lamp.

“Specialty MR lamp” means a lamp that has an MR shape as defined in ANSI C79.1-2002 (incorporated by reference; see 10 CFR 430.3), a diameter of less than or equal to 2.25 inches, a lifetime of less than or equal to 300 hours, and that is designed and marketed for a specialty application.

“Traffic signal lamp” means a lamp that is designed and marketed for traffic signal applications and has a lifetime of 8,000 hours or greater.

**...[skipping to the end of the section]**

## Section 1604. Test Methods for Specific Appliances

...[skipping (a)-(j)]

### (k) Lamps.<sup>1</sup>

(1) The test method for federally regulated general service fluorescent lamps, ~~federally regulated~~ general service incandescent lamps, and ~~federally regulated~~ incandescent reflector lamps is 10 C.F.R. section 430.23(r) (Appendix R to subpart B of part 430).

~~(2) The test method for state-regulated small diameter directional lamps that use incandescent filament technology is 10 C.F.R. section 430.23(r) (Appendix R to subpart B of part 430):~~

~~(3) The test method for medium base compact fluorescent lamps is 10 C.F.R. section 430.23(y) (Appendix W to subpart B of part 430).~~

~~(4) The test methods for each basic model of integrated LED lamps, including LED state-regulated small diameter directional lamps and state-regulated LED lamps, are 10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of part 430) (Jan. 1, 2018) and those shown in Table K-1. For certification, compliance, and enforcement purposes, the sampling provisions in 10 C.F.R. section 429.56 (Jan. 1, 2018) shall be used.~~

**Table K-1**  
**Optional Test Methods for State-Regulated LED Lamps and**  
**LED State-Regulated Small Diameter Directional Lamps**

<i>Measurement</i>	<i>Test Procedure</i>	<i>Required or Optional*</i>
Input power, Lumen output, LPW, Correlated Color Temperature, Duv, Color Rendering Index, Power Factor	IES LM-79 (2008) with additional requirements provided in 10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of part 430).	Required
Lumen Maintenance and Time to Failure	IES LM-84 (2014) and TM-28 (2014) with additional requirements provided in 10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of part 430).	Required
Standby Power	10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of part 430).	Required
Flicker	Title 24, part 6, Joint Appendix 10 (2015), tested at both 100% <u>percent</u> and 20% <u>percent</u> output. Lamps with a percent amplitude modulation (percent flicker) less than 30 percent at frequencies less than 200 Hz shall report "yes" for "reduced flicker operation" described in section 1606 of this Article, otherwise report "no".	Optional
Lumen Maintenance, Rated Life, and Survival Rate for Compliance with Title 24 Joint Appendix 8 and minimum dimming level	Title 24, part 6, Joint Appendix 8 (2015).	Optional
Audible Noise	ENERGY STAR Recommended Practice – Noise (2013) with the following modification: measurements shall be taken at 100 percent output as well as at 20 percent output if dimmable.	Optional

<sup>1</sup> The proposed regulatory language in section 1605.3(k) reflects language adopted by the Energy Commission on July 11, 2018, and expected to become effective on October 1, 2018, pending approval by the Office of Administrative Law. See rulemaking docket number 18-AAER-10.

\* ~~Required test procedures must be conducted per section 1603(a) of this Article for each basic model of lamp.~~ Optional test procedures are conditionally required depending on manufacturer claims of performance as described in sections 1607(d)(12) of this Article and 1606 Table X of this Article.

~~(54) There are no federally prescribed test methods for federally regulated organic light-emitting diode (OLED) lamps; federally regulated candelabra base incandescent lamps, or federally regulated intermediate base incandescent lamps.~~ The test methods for low-lumen lamps are:

(A) for compact fluorescent low-lumen lamps, 10 C.F.R. section 430.23(y) (Appendix W to Subpart B of part 430) (Jan. 1, 2018).

(B) for integrated LED low-lumen lamps, 10 C.F.R. section 430.23(ee) (Appendix BB to Subpart B of part 430) (Jan. 1, 2018).

(C) for all other low-lumen lamps, 10 C.F.R. section 430.23(gg) (Appendix DD to Subpart B of part 430) (Jan. 1, 2018).

(5) The test method for general service lamps that are other than lamp types described in sections 1604(k)(1) through 1604(k)(4) of this Article is 10 C.F.R. section 430.23(gg) (Appendix DD to Subpart B of part 430).

**...[skipping to the end of the section]**

**Section 1605.3. State Standards for Non-Federally-Regulated Appliances.**

...[skipping (a)-(j)]

**(k) Lamps.<sup>2</sup>**

...[skipping (1) Incandescent Reflector Lamps]

(2) Standards for State-Regulated LED Lamps, ~~and~~ General Service Lamps, ~~and~~ Low-Lumen Lamps. General service lamps shall meet the standards shown in Table K-8. Low-lumen lamps shall meet the standards shown in Table K-9. The energy consumption rate of state-regulated LED lamps with a lumen output of 150 lumens or greater for ~~candelabra~~E12 bases, or 200 lumens or greater for ~~other~~E17, E26, or GU24 bases, manufactured on or after the effective dates shown in Table K-910 shall meet the standards shown in that table.

**Table K-8  
Standards for State-Regulated General Service Lamps - Tier II**

<i><b>Lumen Ranges</b></i>	<i><b>Minimum Lamp Efficacy</b></i>	<i><b>Minimum Rated Lifetime</b></i>	<i><b>Effective Date</b></i>
310-2600	45 lumens per watt	1,000 Hours	Jan 1, 2018
<u>310-3300</u>	<u>45 lumens per watt</u>	<u>1,000 Hours</u>	<u>Sold on or after Jan 1, 2020</u>

**Table K-9  
Standards for Low-Lumen Lamps**

<i><b>Lumen Ranges</b></i>	<i><b>Minimum Lamp Efficacy</b></i>	<i><b>Minimum Rated Lifetime</b></i>	<i><b>Effective Date</b></i>
150≤Lumens<310	45 lumens per watt	1,000 Hours	Manufactured on or after Jan 1, 2020

(A) State-regulated LED lamps with lumen output of 150 lumens or greater for ~~candelabra~~E12 bases, or 200 lumens or greater for ~~other~~E17, E26, or GU24 bases, and manufactured on or after January 1, 2018 shall have:

- (i) A color point that meets the requirements in Table B1 of Annex B of ANSI C78.377-2015 for color targets and color consistency.
- (ii) A CRI (Ra) of 82 or greater.
- (iii) Individual color scores of R1, R2, R3, R4, R5, R6, R7, and R8 of 72 or greater.
- (iv) A power factor of 0.7 or greater.
- (v) A rated life of 10,000 hours or greater as determined by the lumen maintenance and time to failure test procedure.
- (vi) 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).

---

<sup>2</sup> The proposed regulatory language in section 1605.3(k) reflects language adopted by the Energy Commission on July 11, 2018, and expected to become effective on October 1, 2018, pending approval by the Office of Administrative Law. See rulemaking docket number 18-AAER-10.

(vii) 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).

(B) In addition to the requirements in section 1605.3(k)(2)(A) of the Article, 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-910**  
**Standards for State-Regulated LED Lamps**

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

...[skipping to the end of the section]

## **Section 1606. Filing by Manufacturers; Listing of Appliances in the MAEDbS.<sup>3</sup>**

### **(a) Filing of Statements.**

Each manufacturer shall electronically file with the Executive Director through the MAEDbS a statement for each appliance that is sold or offered for sale in California. The statement shall contain all of the information described in paragraphs (2) through (4) of this subsection and shall meet all of the requirements of paragraph (1) of this subsection and all other applicable requirements in this Article.

The effective dates of this section shall be the same as the effective dates shown in section 1605.1, 1605.2 or 1605.3 of this Article for appliances for which there is an energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in section 1605.1, 1605.2, or 1605.3 of this Article. For appliances with no energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in section 1605.1, 1605.2, or 1605.3 of this Article, the effective date of this section shall be one year after they are added to section 1601 of this Article, unless a different effective date is specified.

**Exceptions to Section 1606(a) of this Article:** Section 1606(a) of this Article is not applicable to:

1. external power supplies,
2. compressors,
3. portable air conditioners (except for spot air conditioners),
4. small electric motors,~~or~~
5. à la carte chargers meeting the Exception noted in section 1605.3(w)(2) of this Article, or
6. general service lamps.

...[skipping to the end of the section]

---

<sup>3</sup> The proposed regulatory language in section 1605.3(k) reflects language adopted by the Energy Commission on July 11, 2018, and expected to become effective on October 1, 2018, pending approval by the Office of Administrative Law. See rulemaking docket number 18-AAER-10.

## **Section 1607. Marking of Appliances.<sup>4</sup>**

### **(a) Scope of Section 1607.**

Every unit of every appliance within the scope of section 1601 of this Article shall comply with the applicable provisions of this section. The effective dates of this section shall be the same as the effective dates shown in section 1605.1, 1605.2 or 1605.3 of this Article for appliances for which there is an energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in section 1605.1, 1605.2, or 1605.3 of this Article. For appliances with no energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in section 1605.1, 1605.2, or 1605.3 of this Article, the effective date of this section shall be January 1, 2006.

### **(b) Name, Model Number, and Date.**

Except as provided in section 1607(c) of this Article, the following information shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit;

- (1) manufacturer's name or brand name or trademark (which shall be either the name, brand, or trademark of the listed manufacturer specified pursuant to section 1606(a)(2)(A) of this Article;
- (2) model number; and
- (3) date of manufacture, indicating (i) year and (ii) month or smaller (e.g. week) increment. If the date is in a code that is not readily understandable to the layperson, the manufacturer shall immediately, on request, provide the code to the Energy Commission.

### **(c) Exceptions to Section 1607(b).**

- (1) For plumbing fixtures and plumbing fittings, the information required by section 1607(b) of this Article shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit or on the unit's packaging.
- (2) For lamps, the information required by section 1607(b) of this Article shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit, on the unit's packaging, or, where the unit is contained in a group of several units in a single package, on the packaging of the group.
- (3) For fluorescent lamp ballasts, the date of manufacture information required by section 1607(b)(3) of this Article shall indicate (i) year and (ii) three-month or smaller increment. If the date is in a code that is not readily understandable to the layperson, the manufacturer shall immediately, on request, provide the code to the Energy Commission.

**...[skipping to the end of the section]**

---

<sup>4</sup> The proposed regulatory language in section 1605.3(k) reflects language adopted by the Energy Commission on July 11, 2018, and expected to become effective on October 1, 2018, pending approval by the Office of Administrative Law. See rulemaking docket number 18-AAER-10.

## Section 1608. Compliance, Enforcement, and General Administrative Matters.<sup>5</sup>

### (a) General Requirements for the Sale or Installation of All Appliances.

Any unit of any appliance within the scope of section 1601 of this Article may be sold or offered for sale in California only if:

(1) the appliance appears in the most recent MAEDbS established pursuant to section 1606(c) of this Article, unless the only reason for the appliance's absence from the MAEDbS is its failure to comply with an applicable standard in section 1605.1 of this Article;

(2) the manufacturer has:

(A) tested the appliance as required by sections 1603 and 1604 of this Article;

(B) marked the unit as required by section 1607 of this Article;

(C) for any appliance for which there is an applicable standard in section 1605.2 or 1605.3 of this Article, certified under section 1606(a) of this Article that the appliance complies with the standard;

(3) the unit has the same components, design characteristics, and all other features that affect energy or water consumption or energy or water efficiency, as applicable, as the units that were tested under sections 1603 and 1604 of this Article and for which information was submitted under section 1606(a) of this Article; and

(4) for any appliance for which there is an applicable standard in section 1605.2 or 1605.3 of this Article, the unit complies with the standard.

**Exceptions: to Sections 1608(a)(1) and 1608(a)(2)(C) of this Article.** Sections 1608(a)(1) and 1608(a)(2)(C) of this Article are not applicable to:

1. external power supplies,
2. compressors,
3. portable air conditioners (except for spot air conditioners),
4. small electric motors,~~or~~
5. à la carte chargers meeting the EXCEPTION noted in section 1605.3(w)(2) of this Article, or
6. general service lamps.

...[skipping to the end of the section]

---

<sup>5</sup> The proposed regulatory language in section 1605.3(k) reflects language adopted by the Energy Commission on July 11, 2018, and expected to become effective on October 1, 2018, pending approval by the Office of Administrative Law. See rulemaking docket number 18-AAER-10.