DOCKETED	
Docket Number:	19-AAER-04
Project Title:	General Service Lamps
TN #:	231356
Document Title:	Final Regulatory Text
Description:	Final form 400 and regulatory text for the General Service Lamp regulations.
Filer:	Corrine Fishman
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/31/2019 11:15:07 AM
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STATE OF CALIFORNIA--OFFICE OF ADMINISTRATIVE LAW

NOTICE PUBLICATION/REGULATIONS SUBMISSION REGULAR (See instructions on reverse)

STD. 400 (REV. 01-2013)

For use by Secretary of State only

ENDORSED - FILED
in the office of the Secretary of State
of the State of California
DEC 24 2019
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OAL FILE NUMBERS	NOTICE FILE NUMBER	REGULATORY ACTION NUMBER	EMERGENCY NUMBER
	Z-2019-0806-04	2019-1114-04S	

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2019 NOV 14 P 4:28

OFFICE OF ADMINISTRATIVE LAW

NOTICE | REGULATIONS

AGENCY WITH RULEMAKING AUTHORITY
California Energy Commission

AGENCY FILE NUMBER (If any)
19-AAER-04

A. PUBLICATION OF NOTICE (Complete for publication in Notice Register)

1. SUBJECT OF NOTICE	TITLE(S)	FIRST SECTION AFFECTED	2. REQUESTED PUBLICATION DATE
Appliance Efficiency Regulations	20	1004	August 16, 2019

3. NOTICE TYPE	4. AGENCY CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER (Optional)
[X] Notice re Proposed Regulatory Action [ ] Other	Corrine Fishman	(916) 654-4976	

OAL USE ONLY

ACTION ON PROPOSED NOTICE: [ ] Approved as Submitted [ ] Approved as Modified [ ] Disapproved/ Withdrawn

NOTICE REGISTER NUMBER: 2019, 33-Z

PUBLICATION DATE: 8/16/2019

B. SUBMISSION OF REGULATIONS (Complete when submitting regulations)

1a. SUBJECT OF REGULATION(S)
Appliance Efficiency Regulations for General Service Lamps

1b. ALL PREVIOUS RELATED OAL REGULATORY ACTION NUMBER(S)

2. SPECIFY CALIFORNIA CODE OF REGULATIONS TITLE(S) AND SECTION(S) **(Including title 26, if toxics related)**

SECTION(S) AFFECTED (List all section number(s) individually. Attach additional sheet if needed.)

ADOPT: 1004

AMEND: 1602, 1604, 1605.1, 1605.3, 1606, 1608

REPEAL:

TITLE(S): 20

3. TYPE OF FILING

- [X] Regular Rulemaking (Gov. Code §11346)
- [ ] Resubmittal of disapproved or withdrawn nonemergency filing (Gov. Code §§11349.3, 11349.4)
- [ ] Emergency (Gov. Code, §11346.1(b))
- [ ] Certificate of Compliance: The agency officer named below certifies that this agency complied with the provisions of Gov. Code §§11346.2-11347.3 either before the emergency regulation was adopted or within the time period required by statute.
- [ ] Resubmittal of disapproved or withdrawn emergency filing (Gov. Code, §11346.1)
- [ ] Emergency Readopt (Gov. Code, §11346.1(h))
- [ ] File & Print
- [ ] Other (Specify) _____
- [ ] Changes Without Regulatory Effect (Cal. Code Regs., title 1, §100)
- [ ] Print Only

per agency request 12/24/2019

4. ALL BEGINNING AND ENDING DATES OF AVAILABILITY OF MODIFIED REGULATIONS AND/OR MATERIAL ADDED TO THE RULEMAKING FILE (Cal. Code Regs. title 1, §44 and Gov. Code §11347.1)

5. EFFECTIVE DATE OF CHANGES (Gov. Code, §§ 11343.4, 11346.1(d); Cal. Code Regs., title 1, §100)

- [ ] Effective January 1, April 1, July 1, or October 1 (Gov. Code §11343.4(a))
- [ ] Effective on filing with Secretary of State
- [ ] §100 Changes Without Regulatory Effect
- [X] Effective other (Specify) January 1, 2020

6. CHECK IF THESE REGULATIONS REQUIRE NOTICE TO, OR REVIEW, CONSULTATION, APPROVAL OR CONCURRENCE BY, ANOTHER AGENCY OR ENTITY

- [ ] Department of Finance (Form STD. 399) (SAM §6660)
- [ ] Fair Political Practices Commission
- [ ] State Fire Marshal
- [ ] Other (Specify)

7. CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER (Optional)	E-MAIL ADDRESS (Optional)
Corrine Fishman	(916) 654-4976		corrine.fishman@gmail.com

8. **I certify that the attached copy of the regulation(s) is a true and correct copy of the regulation(s) identified on this form, that the information specified on this form is true and correct, and that I am the head of the agency taking this action, or a designee of the head of the agency, and am authorized to make this certification.**

SIGNATURE OF AGENCY HEAD OR DESIGNEE

DATE: 11/13/19

TYPED NAME AND TITLE OF SIGNATORY
Drew Bohan, Executive Director

For use by Office of Administrative Law (OAL) only

ENDORSED APPROVED

DEC 24 2019

Office of Administrative Law

Regulatory Language

§ 1004. Severability.

Each part of this division shall be deemed severable, and in the event that any provision of this division is held to be invalid, the remainder of this division shall continue in full force and effect.

Note: Authority cited: Sections 25213 and 25218, Public Resources Code.
Reference: Section 25213, Public Resources Code.

§ 1602. Definitions.

(a) General.

In this Article the following definitions apply. If a term is not defined here, the applicable definition in NAECA, EPAct, the EPAct 2005, EISA, or the test methods listed in section 1604 of this Article shall apply where it is reasonable to do so.

...[skipping "AC" through "Consumer product"]

"Correlated color temperature (CCT)" means the color appearance, or actual color of the lamp in accordance with IES LM-16-1993.

...[skipping "CSA" through "Gas"]

"General lighting application" means lighting that provides an interior or exterior area with overall illumination.

...[skipping through the end of (a)]

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

(k) Lamps.

(1) General Service Lamps Sold Before January 1, 2020, and All Other Lamps.

...[skipping "Appliance Lamp" through "Voltage Range"]

(2) General Service Lamps Sold 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 lamp" 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 13.3-1995; 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).

"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;

(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, or is able to operate at any voltage for non-integrated lamps; 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;

(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, 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 that have a first number symbol less than 16 (diameter less than 2 inches) as defined in ANSI C79.1-2002 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;

(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, nominal overall length less than 12 inches, and that are not compact fluorescent lamps;

(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 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 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.

"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 and ANSI C79.1-2002 and is used to provide directional light.

"Showcase lamp" means a lamp that has a T shape as specified in ANSI C78.20-2003 and ANSI C79.1-2002, 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 multifaceted reflector (MR) lamp" means a lamp that has an MR shape as defined in ANSI C79.1-2002, 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 (l)-(m)]

(n) Luminaires and Torchieres.

...[skipping "Art work luminaire" through "Automatic daylight control"]

~~"Correlated Color temperature (CCT)" means the color appearance, or actual color of the lamp in accordance with IES LM-16-1993.~~

...[skipping through the end of subdivision (x)]

The following documents are incorporated by reference in section 1602:

Number	Title
...	
	AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
...	
ANSI C78.21-1989	Incandescent Lamps - PAR and R Shapes
ANSI C78.20-2003	for electric lamps - A, G, PS, and Similar Shapes with E26 Medium Screw Bases
ANSI C78.81-2003	American National Standard for Electric Lamp Bases

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

Note: Authority cited: Sections 25213, 25218(e), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Reference: Sections 25216.5(d), 25401.9, 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and Section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

§ 1604. Test Methods for Specific Appliances.

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

(k) Lamps.

(1) The test method for ~~federally regulated general service fluorescent lamps, federally regulated~~ general service incandescent lamps, ~~and federally regulated~~ incandescent reflector lamps, and federally regulated general service fluorescent 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).~~

(32) 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).

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

(4) The optional test methods for state-regulated small diameter directional lamps and state-regulated LED lamps are shown in Table K-1. Optional test procedures are conditionally required depending on manufacturer claims of performance as described in sections 1607(d)(13) of this Article and 1606 Table X of this Article. For certification, compliance, and enforcement purposes, the sampling provisions in 10 C.F.R. section 429.56 shall be used.

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

Measurement	***Test Procedure***	~~***Required or Optional***~~
~~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% percent and 20% percent 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, part 6, Joint Appendix 8 (2015).	~~Optional~~

Title 24 Joint Appendix 8 and minimum dimming level		
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~~

~~* 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)(13) of this Article and 1606 Table X of this Article.~~

(5) ~~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 method for general service lamps that are other than lamp types described in sections 1604(k)(1) through 1604(k)(3) of this Article is 10 C.F.R. section 430.23(gg) (Appendix DD to Subpart B of part 430).

...[skipping (l)-(x)]

The following documents are incorporated by reference in section 1604.

...[skipping CALIFORNIA ENERGY COMMISSION TEST METHODS]

FEDERAL TEST METHODS

C.F.R., Title 10, section 429.56, 429.63, and 429.70

C.F.R., Title 10, section 430.23, and 10 C.F.R. Appendixes A, B, C1, D1, D2, E, F, H, I, J1, J2, M, N, O, P, Q, R, S, T, U, V, W, X, S1, Y, Z, AA, BB, ~~and~~ CC, and DD of subpart B of part 430

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

Note: Authority cited: Sections 25213, 25218(e), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015).
Reference: Sections 25216.5(d), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

§ 1605.1. Federal and State Standards for Federally Regulated Appliances.

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

(k) Lamps.

...[skipping (k)(1)]

(2) **Federally Regulated** **Incandescent Reflector Lamps** ~~**Manufactured On or After July 15, 2012**~~**.**

(A) The average lamp efficacy of federally regulated incandescent reflector lamps with a rated lamp wattage between 40-205 watts, and manufactured on or after July 15, 2012, and sold before January 1, 2020, shall be not less than the applicable values shown in Table K-3, ~~subject to the following:~~

~~(A) The standards specified in Table K-3 shall apply with respect to:~~

~~1. ER incandescent reflector lamps, BR incandescent reflector lamps, BPAR incandescent reflector lamps, and similar bulb shapes on and after January 1, 2008; and~~

~~2. Incandescent reflector lamps with a diameter of more than 2.25 inches, but not more than 2.75 inches, on and after June 15, 2008.~~

EXCEPTION to Section 1605.1(k)(2)(A). The standards specified in Table K-3 shall not apply to the following types of incandescent reflector lamps:

(1) Lamps rated at 50 watts or less that are ER30, BR30, BR40, or ER40;

(2) Lamps rated at 65 watts that are BR30, BR40, or ER40 lamps; or

(3) R20 incandescent reflector lamps rated 45 watts or less.

Table K-3
Standards for Federally Regulated Incandescent Reflector Lamps Manufactured On or After July 15, 2012, and Sold Before January 1, 2020

Lamp Spectrum	*Lamp Diameter (inches)*	*Rated Voltage*	*Minimum Average Lamp Efficacy (LPW)*[1]
Standard Spectrum	> 2.5	≥ 125	$6.8 \times P^{0.27}$
		< 125	$5.9 \times P^{0.27}$
	≤ 2.5	≥ 125	$5.7 \times P^{0.27}$
		< 125	$5.0 \times P^{0.27}$
Modified Spectrum	> 2.5	≥ 125	$5.8 \times P^{0.27}$
		< 125	$5.0 \times P^{0.27}$
	≤ 2.5	≥ 125	$4.9 \times P^{0.27}$
		< 125	$4.2 \times P^{0.27}$
[1]P = Rated Lamp Wattage, in Watts			

(B) See sections 1605.1(k)(6) and 1605.3(k)(1)(B) for energy efficiency standards for incandescent reflector lamps that are general service lamps and sold on or after January 1, 2020.

(3) **Medium Base Compact Fluorescent Lamps.**

(A) A bare lamp or covered lamp (no reflector) medium base compact fluorescent lamp manufactured on or after January 1, 2006, and sold before January 1, 2020, shall meet the requirements set forth in Table K-4.

Table K-4
Standards for Medium Base Compact Fluorescent Lamps Manufactured On or After January 1, 2006, and Sold Before January 1, 2020

Factor	*Requirements*

Labeled Wattage (Watts) and Configuration[1]	*Measured Initial Lamp Efficacy: lumens/watt must be at least:*[2]
Bare Lamp:	
Labeled Wattage < 15	45.0
Labeled Wattage ≥ 15	60.0
Covered Lamp (no reflector)	
Labeled Wattage < 15	40.0
15 ≥ Labeled Wattage < 19	48.0
19 ≥ Labeled Wattage < 25	50.0
Labeled Wattage ≥ 25	55.0
Lumen Maintenance at 1,000-hours	≥90%
Lumen Maintenance at 40% of Lifetime[2]	80%
Rapid Cycle Stress Test	Each lamp must be cycled once for every two hours of lifetime.[2] At least 5 lamps must meet or exceed the minimum number of cycles.
Lifetime[2]	≥ 6,000
[1] Use labeled wattage to determine the appropriate efficacy requirements in this table; do not use measured wattage for this purpose.	
[2] Lifetime refers to lifetime of a compact fluorescent lamp as defined in section 1602(k) of this Article.	

(B) See sections 1605.1(k)(6) and 1605.3(k)(1)(B) for energy efficiency standards for compact fluorescent lamps that are general service lamps and sold on or after January 1, 2020.

(4) ~~Federally Regulated~~ General Service Incandescent Lamps and Modified Spectrum General Service Incandescent Lamps.

(A) The energy consumption rate of federally regulated general service incandescent lamps and modified spectrum general service incandescent lamps, manufactured on or after the effective dates shown and sold before January 1, 2020, shall be no greater than the maximum rated wattage shown in Tables K-5 and K-6.

~~(A)~~1. These standards apply to each lamp that:

~~1.~~a. is intended for a general service or general illumination application (whether incandescent or not);

~~2.~~b. has a medium screw base or any other screw base not defined in ANSI C81.61-2006; and

~~3.~~c. is capable of being operated at a voltage at least partially within the range of 110 to 130 volts; ~~and~~

~~4. is manufactured or imported after December 31, 2011~~.

~~(B)~~2. Each lamp described in section 160~~4~~5.1(k)(4)(A)1. of this Article shall have a color rendering index that is greater than or equal to:

~~1.~~a. 80 for nonmodified spectrum lamps; or

~~2.~~b. 75 for modified spectrum lamps.

Table K-5
Standards for Federally Regulated General Service Incandescent Lamps Manufactured On or After the Effective Date Shown Below, and Sold Before January 1, 2020

Rated Lumen Ranges	*Maximum Rate Wattage*	*Minimum Rate Lifetime*	*Effective Date*
1490-2600	72	1,000 hours	January 1, 2012
1050 – 1489	53	1,000 hours	January 1, 2013
750 – 1049	43	1,000 hours	January 1, 2014
310 – 749	29	1,000 hours	January 1, 2014

Table K-6
Standards for Federally Regulated Modified Spectrum General Service Incandescent Lamps Manufactured On or After the Effective Date Shown Below, and Sold Before January 1, 2020

Rated Lumen Ranges	*Maximum Rate Wattage*	*Minimum Rate Lifetime*	*Effective Date*
1118-1950	72	1,000 hours	January 1, 2012
788-1117	53	1,000 hours	January 1, 2013
563-787	43	1,000 hours	January 1, 2014
232-562	29	1,000 hours	January 1, 2014

(B) See sections 1605.1(k)(6) and 1605.3(k)(1)(B) for energy efficiency standards for general service incandescent lamps that are general service lamps and sold on or after January 1, 2020.

(5) **Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps.**

(A) The energy consumption rate of federally regulated candelabra base incandescent lamps and intermediate base incandescent lamps, manufactured on or after January 1, 2012, and sold before January 1, 2020, shall be no greater than the maximum rated wattage shown in Table K-7.

Table K-7
Standards for Federally Regulated Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps Manufactured On or After January 1, 2012, and Sold Before January 1, 2020

Lamp Base Type	*Maximum Rated Wattage*
Candelabra	60
Intermediate	40

(B) See sections 1605.1(k)(6) and 1605.3(k)(1)(B) for energy efficiency standards for candelabra base incandescent lamps and intermediate base incandescent lamps that are general service lamps and sold on or after January 1, 2020.

(6) **General Service Lamps.** General service lamps sold on or after January 1, 2020, shall have a minimum lamp efficacy of 45 lumens per watt.

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

Note: Authority cited: Sections 25213, 25218(e), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Reference: Sections 25216.5(d), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

§ 1605.3. State Standards for Non-Federally-Regulated Appliances.

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

(k) Lamps.

~~(1) Incandescent Reflector Lamps. See section 1605.1(k)(2) for standards for federally regulated incandescent reflector lamps.~~

~~(2)~~(1) ~~Standards for State-Regulated LED Lamps and~~ **General Service Lamps.**

(A) General service lamps manufactured on or after January 1, 2018, and sold before January 1, 2020, shall meet the standards shown in Table K-8. ~~The energy consumption rate of state-regulated LED lamps with a lumen output of 150 lumens or greater for candelabra bases, or 200 lumens or greater for other bases, manufactured on or after the effective dates shown in Table K-9 shall meet the standards shown in that table.~~

Table K-8:
Standards for ~~State-Regulated~~ General Service Lamps ~~– Tier II~~

Lumen Ranges	*Minimum Lamp Efficacy*	*Minimum Rated Lifetime*	*Effective Date*
310-2600	45 lumens per watt	1,000 Hours	Manufactured on or after January~~.~~ 1, 2018, and sold before January 1, 2020

(B) General service lamps sold on or after January 1, 2020, shall have a minimum lamp efficacy of 45 lumens per watt.

(2) **State-Regulated LED Lamps.**

(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, and GU24 bases, and manufactured on or after January 1, 2018, shall meet all of the standards shown in Table K-9 and shall have the following:

~~(i)~~1. 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)~~2. A CRI (Ra) of 82 or greater.

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

~~(iv)~~4. A power factor of 0.7 or greater.

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

~~(vi)~~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).

~~(vii)~~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).

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

Table K-9
Standards for State-regulated LED Lamps

Effective Date	*Minimum Compliance Score*	*Minimum Efficacy Lumens Per Watt*
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.		

(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.

(4) **GU24 Base Lamps.** GU24 base lamps shall not be incandescent lamps.

(5) See section 1605.1(k) of this Article for energy efficiency standards for federally regulated lamps.

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

Note: Authority cited: Sections 25213, 25218(e), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Reference: Sections 25216.5(d), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

§ 1606. Filing by Manufacturers; Listing of Appliances in the MAEDbS.

(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. small electric motors, ~~or~~

3. à la carte chargers meeting the EXCEPTION noted in section 1605.3(w)(2) of this Article<u>, or</u>

<u>4. general service lamps.</u>

...[skipping (a)(1) to Table X]

Table X

Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
	All Appliances	* Manufacturer's Name	
		* Brand Name	
		* Model Number	
		Date model to be displayed	
		Regulatory Status	Federally regulated consumer product, federally-regulated commercial and industrial equipment, non-federally regulated

...[skipping A through J]

K	Federally regulated general service fluorescent lamps	*Type	4-foot medium bipin general service fluorescent lamp, 2-foot U-shaped general service fluorescent lamp, 8-foot slim line general service fluorescent lamp, 8-foot high output general service fluorescent lamp, 4-foot miniature bipin standard output general service fluorescent lamp, 4-foot miniature bipin high output general service fluorescent lamp
		Rated Color Rendering Index	
		Correlated Color Temperature (for lamps manufactured on or after July 15, 2012)	
		Minimum Average Lamp Efficacy (LPW)	
	Federally regulated incandescent reflector lamps sold before January 1, 2020	Minimum Average Lamp Efficacy	
	Federally regulated Medium Screw Base Compact Fluorescent	Lamp Power (Watts)	
		Minimum Efficacy (LPW)	
		Lamp Configuration	Bare or Covered (no reflector)
		1,000 Hour Lumen Maintenance	True, False

Lamps sold before January 1, 2020	Lumen Maintenance Requirements	True, False
	Rapid Cycle Stress Test	True, False
	Average Rated Lamp Life	True, False
Federally regulated Medium Screw Base General Service Incandescent and OLED Lamps; ~~OLEDs~~ sold before January 1, 2020	Type	General Service Incandescent, ~~LED,~~ OLED
	Voltage Range	
	Rated Lumen Range	
	Maximum Rate Wattage	
	Minimum Rate Lifetime	
	Color Rendering Index	
	Minimum Efficacy (LPW) (required on or after January 1, 2018)	
	Modified Spectrum	True, False
	Bulb Finish (incandescent only)	Clear, frost, soft white
	ANSI-designated Bulb Shape	A15, A19, A21, A23, A25, PS25, PS30, BT14.5, BT15, CP19, TB19, CA22
Federally regulated Candelabra Base and Intermediate Base Incandescent Lamps sold before January 1, 2020	Base Type	Candelabra, intermediate
	Maximum Rated Wattage	
Federally regulated Medium Screw Base Modified Spectrum General Service Incandescent Lamps sold before January 1, 2020	Type	
	Rated Voltage	
	Rated Lumen Range	
	Maximum Rate Wattage	
	Minimum Rate Lifetime	
	Color Rendering Index	
~~State-regulated medium screw base general service Compact Fluorescent lamps~~	~~Rated lumens~~	
	~~Rated lamp wattage~~	
	~~Average lamp efficacy~~	
	Base Type	

State-regulated small diameter directional lamps	Lamp Type (examples PAR16, MR11, MR16, R)	
	Lamp Power (Watts)	
	Lamp Output (Lumens)	
	Beam Angle	
	Center Beam Candle Power (CBCP)	
	Efficacy (Lumens per watt)	
	Color Rendering Index (CRI)	
	Combined CRI + Efficacy (only applies where efficacy < 80 LPW)	
	Correlated Color Temperature	
	Rated Lifetime Test Completed	True, False
	Estimated Rated Lifetime (hours) (when "Rated Lifetime Test Completed" = False)	
	Rated Lifetime (hours) (when "Rated Lifetime Test Completed" = True)	
State-regulated Light Emitting Diode (LED) lamps	*Base Type	E12, E17, E26, GU24, retrofit kit
	Lamp Shape	A, B, BA, C, CA, F, G, Other
	Dimmable	True, False
	Minimum Dimming Level (%) (~~if~~when "Dimmable" ~~=~~equals True)	
	Reduced Flicker Operation (~~if~~when "Dimmable" ~~=~~equals True)	True, False
	Correlated Color Temperature	
	Duv	
	Rated Lifetime Test Completed	True, False
	Estimated Rated Lifetime (hours) (when "Rated Lifetime Test Completed" = False)	
	Rated Lifetime (hours) (when "Rated Lifetime Test Completed" = True)	
	Lifetime test environment temperature[2]	Ambient, Elevated

		Lamp Power (Watts)	
		Lumen Output (Lumens)	
		Efficacy (Lumens per watt)	
		Color Rendering Index (Ra)	
		Compliance Score	
		Power Factor	
		Standby Mode	True, False
		Standby Power (watts) (if applicable)	
		Connected network type (if applicable)	Wi-Fi, ZigBee, ANT, Bluetooth, RF, Wired, Other ~~(specify)~~
		R_1	
		R_2	
		R_3	
		R_4	
		R_5	
		R_6	
		R_7	
		R_8	
		R_9 [2]	
		Meets applicable luminous intensity distribution requirements	ENERGY STAR Omnidirectional, ENERGY STAR Decorative, none.
		Audible Noise at 100% output (decibels) (~~if~~when "Dimmable" ~~=equals~~ True)	
		Audible Noise at 20% output (decibels) (~~if~~when "Dimmable" ~~=equals~~ True)	
		Start Time [2]	
		6000 hour lumen maintenance [2]	
		6000 hour survival rate [2]	
		Projected time to L70 [2]	

		Dimming Control Compatibility (~~if~~when "Dimmable" ~~=equals~~ True)	Forward, Phase cut control, reverse phase cut, powerline carrier, digital, 0-10 VDC, other.
		NEMA SSL 7A Compatible [2] (If compatible with forward phase cut dimmer control answer "True," If not answer "False.")	True, False

* "Identifier" information as described in section 1602(a) of this Article.
1 = Voluntary for federally regulated appliances
2 = Voluntary for state-regulated appliances

...[skipping remaining text in Table X through end of section 1606]

Note: Authority cited: Sections 25213, 25218(e), 25401.9, 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Reference: Sections 25216.5(d), 25401.9, 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and Section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

§ 1608. Compliance, Enforcement, and General Administrative Matters.

(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. small electric motors, ~~or~~

3. à la carte chargers meeting the EXCEPTION noted in section 1605.3(w)(2) of this Article; or

4. general service lamps.

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

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-(c) and 25960, Public Resources Code.

Reference: Sections 25216.5(d), 25402(a)-(c) and 25960, Public Resources Code.

AEC_{SD} = annual energy consumption in cooling mode for single-duct portable air conditioners, in kWh/year, calculated in section 5.3 of this appendix.

AEC_{DS} and AEC_{SI} = annual energy consumption for the two cooling mode test conditions in Table 1 of this appendix for dual-duct portable air conditioners, in kWh/year, calculated in section 5.3 of this appendix.

AEC_T = total annual energy consumption attributed to all modes except cooling, in kWh/year, calculated in section 5.3 of this appendix.

t = number of cooling mode hours per year, 750.

k = 0.001 kWh/Wh conversion factor for watt-hours to kilowatt-hours.

0.2 = weighting factor for the 95 °F dry-bulb outdoor condition test.

0.8 = weighting factor for the 83 °F dry-bulb outdoor condition test.

[81 FR 35265, June 1, 2016, as amended at 81 FR 70923, Oct. 14, 2016]

APPENDIX DD TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION AND ENERGY EFFICIENCY OF GENERAL SERVICE LAMPS THAT ARE NOT GENERAL SERVICE INCANDESCENT LAMPS, COMPACT FLUORESCENT LAMPS, OR INTEGRATED LED LAMPS

NOTE: On or after April 19, 2017, any representations, including certifications of compliance (if required), made with respect to the energy use or efficiency of general service lamps that are not general service incandescent lamps, compact fluorescent lamps, or integrated LED lamps must be made in accordance with the results of testing pursuant to this appendix DD.

1. *Scope:* This appendix DD specifies the test methods required to measure the initial lumen output, input power, lamp efficacy, power factor, and standby mode energy consumption of general service lamps that are not general service incandescent lamps, compact fluorescent lamps, or integrated LED lamps.

2. *Definitions:*

Measured initial input power means the input power to the lamp, measured after the lamp is stabilized and seasoned (if applicable), and expressed in watts (W).

Measured initial lumen output means the lumen output of the lamp, measured after the lamp is stabilized and seasoned (if applicable), and expressed in lumens (lm).

Power factor means the measured initial input power (watts) divided by the product of the input voltage (volts) and the input current (amps) measured at the same time as the initial input power.

3. Active Mode Test Procedures

3.1. Take measurements at full light output.

3.2. Do not use a goniophotometer.

3.3. For single base OLED and non-integrated LED lamps, position a lamp in either the base-up and base-down orientation throughout testing. Test an equal number of lamps in the sample in the base-up and base-down orientations, except that, if the manufacturer restricts the orientation, test all of the units in the sample in the manufacturer-specified orientation. For double base OLED and non-integrated LED lamps, test all units in the horizontal orientation except that, if the manufacturer restricts the orientation, test all of the units in the sample in the manufacturer-specified orientation.

3.4. Operate the lamp at the rated voltage throughout testing. For lamps with multiple rated voltages including 120 volts, operate the lamp at 120 volts. If a lamp is not rated for 120 volts, operate the lamp at the highest rated input voltage. For non-integrated LED lamps, operate the lamp at the manufacturer-declared input voltage and current.

3.5. Operate the lamp at the maximum input power. If multiple modes occur at the same maximum input power (such as variable CCT or CRI), the manufacturer may select any of these modes for testing; however, all measurements must be taken at the same selected mode. The manufacturer must indicate in the test report which mode was selected for testing and include detail such that another laboratory could operate the lamp in the same mode.

3.6. To measure initial lumen output, input power, input voltage, and input current use the test procedures in the table in this section.

TABLE 3.1—REFERENCES TO INDUSTRY STANDARD TEST PROCEDURES

Lamp type	Referenced test procedure
General service incandescent lamps	Appendix R to subpart B of 10 CFR part 430.
Compact fluorescent lamps	Appendix W to subpart B of 10 CFR part 430.
Integrated LED lamps	Appendix BB to subpart B of 10 CFR part 430.
Other incandescent lamps that are not reflector lamps	IES LM–45–15, sections 4–6, and section 7.1.*
Other incandescent lamps that are reflector lamps	IES LM–20–13, sections 4–6, and section 8.*
Other fluorescent lamps	IES LM–9–09–DD, sections 4–6, and section 7.5.*
OLED lamps	IES LM–79–08–DD, sections 1.3 (except 1.3f), 2.0, 3.0, 5.0, 7.0, 8.0, 9.1 and 9.2.*

TABLE 3.1—REFERENCES TO INDUSTRY STANDARD TEST PROCEDURES—Continued

Lamp type	Referenced test procedure
Non-integrated LED lamps	IES LM–79–08–DD, sections 1.3 (except 1.3f), 2.0, 3.0, 5.0, 7.0, 8.0, 9.1 and 9.2.*

*Incorporated by reference, see §430.3.

3.7. Determine initial lamp efficacy by dividing the measured initial lumen output (lumens) by the measured initial input power (watts).

3.8. Determine power factor by dividing the measured initial input power (watts) by the product of the measured input voltage (volts) and measured input current (amps).

4. Standby Mode Test Procedure

4.1. Measure standby mode power only for lamps that are capable of standby mode operation.

4.2. Maintain lamp orientation as specified in section 3.3 of this appendix.

4.3. Connect the lamp to the manufacturer-specified wireless control network (if applicable) and configure the lamp in standby mode by sending a signal to the lamp instructing it to have zero light output. Lamp must remain connected to the network throughout testing.

4.4. Operate the lamp at the rated voltage throughout testing. For lamps with multiple rated voltages including 120 volts, operate the lamp at 120 volts. If a lamp is not rated for 120 volts, operate the lamp at the highest rated input voltage.

4.5. Stabilize the lamp prior to measurement as specified in section 5 of IEC 62301–DD (incorporated by reference: see §430.3).

4.6. Measure the standby mode power in watts as specified in section 5 of IEC 62301–DD (incorporated by reference: see §430.3).

[81 FR 72504, Oct. 20, 2016]

Subpart C—Energy and Water Conservation Standards

§430.31 Purpose and scope.

This subpart contains energy conservation standards and water conservation standards (in the case of faucets, showerheads, water closets, and urinals) for classes of covered products that are required to be administered by the Department of Energy pursuant to the Energy Conservation Program for Consumer Products Other Than Automobiles under the Energy Policy and Conservation Act, as amended (42 U.S.C. 6291 *et seq.*).

[63 FR 13317, Mar. 18, 1998, as amended at 78 FR 62993, Oct. 23, 2013]

§430.32 Energy and water conservation standards and their compliance dates.

The energy and water (in the case of faucets, showerheads, water closets, and urinals) conservation standards for the covered product classes are:

(a) *Refrigerators/refrigerator-freezers/freezers.* These standards do not apply to refrigerators and refrigerator-freezers with total refrigerated volume exceeding 39 cubic feet (1104 liters) or freezers with total refrigerated volume exceeding 30 cubic feet (850 liters). The energy standards as determined by the equations of the following table(s) shall be rounded off to the nearest kWh per year. If the equation calculation is halfway between the nearest two kWh per year values, the standard shall be rounded up to the higher of these values.

The following standards remain in effect from July 1, 2001 until September 15, 2014:

Product class	Energy standard equations for maximum energy use (kWh/yr)
1. Refrigerators and refrigerator-freezers with manual defrost	8.82AV + 248.4 0.31av + 248.4
2. Refrigerator-freezers—partial automatic defrost	8.82AV + 248.4 0.31av + 248.4
3. Refrigerator-freezers—automatic defrost with top-mounted freezer without through-the-door ice service and all-refrigerator—automatic defrost.	9.80AV + 276.0 0.35av + 276.0
4. Refrigerator-freezers—automatic defrost with side-mounted freezer without through-the-door ice service	4.91AV + 507.5 0.17av + 507.5
5. Refrigerator-freezers—automatic defrost with bottom-mounted freezer without through-the-door ice service.	4.60AV + 459.0 0.16av + 459.0