

**DOCKETED**

<b>Docket Number:</b>	22-AAER-02
<b>Project Title:</b>	Repeal of Portable Luminaires
<b>TN #:</b>	247750
<b>Document Title:</b>	Document Relied Upon – Staff Paper for Repeal of Portable Luminaires
<b>Description:</b>	Staff Paper for the Repeal of Portable Luminaires Rulemaking, a Document Relied Upon. *** This Document Supersedes TN#247380 ***
<b>Filer:</b>	Carlos Baez
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	11/28/2022 3:35:48 PM
<b>Docketed Date:</b>	11/28/2022

California Energy Commission

**STAFF PAPER**

# **Proposed Repeal of Portable Luminaires Regulations**

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**October 2022 | CEC-400-2022-005**

## **PREFACE**

On December 3, 2008, the California Energy Commission (CEC) adopted changes to Appliance Efficiency Regulations (California Code of Regulations, Title 20, sections 1601 through 1609) to include new appliance efficiency regulations for portable luminaires. The new regulations included definitions, testing requirements, certification requirements, and energy performance standards for portable luminaires. In addition, portable luminaires were required to comply with the general marking and certification requirements for all regulated appliances.

On December 9, 2020, the CEC adopted a rulemaking that included numerous amendments to the Appliance Efficiency Regulations. One of the adopted changes was the removal of the minimum lumen output performance requirement for portable luminaires. No other requirements or information related to portable luminaires was changed as part of this rulemaking.

On April 26, 2022, the CEC issued an order instituting rulemaking to consider repealing the existing regulations for portable luminaires found in the Appliance Efficiency Regulations. The goal of the rulemaking is to remove all definitions and testing, marking, certification, and performance requirements related to portable luminaires.

This paper contains the proposed regulatory changes for portable luminaires.

## ABSTRACT

This paper discusses proposed repeal of portable luminaires from the Appliance Efficiency Regulations (California Code of Regulations, Title 20, sections 1601 to 1609). These proposed updates are part of the 2022 Appliance Efficiency Rulemaking (Docket #2022-AAER-02). The proposed updates include, but are not limited to, the removal of all definitions and testing, marking, certification, and performance requirements for portable luminaires.

If the proposed updates are adopted, there will be no changes to portable luminaires on the market. Therefore, statewide energy use and savings, and related environmental impacts and benefits, will not be affected.

**Keywords:** Appliance efficiency regulations, appliance regulations, portable luminaires, compliance

Please use the following citation for this report:

Baez, Carlos. August 2022. *Proposed Repeal of Portable Luminaires*. California Energy Commission. Publication Number: CEC-400-2022-005.

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## **EXECUTIVE SUMMARY**

This paper presents the California Energy Commission (CEC) staff analysis of the proposed repeal of portable luminaires from the Appliance Efficiency Regulations.

CEC staff proposes to completely remove the portable luminaire appliance type from the Appliance Efficiency Regulations. The goal of the rulemaking is to remove all definitions and testing, marking, certification, and performance requirements related to portable luminaires. The existing performance standards have become redundant. The original energy saving goals of the performance standards are now accomplished through more recent regulations regarding other lighting products. The lighting market has transformed in such a way that portable luminaires being sold in California are energy efficient even without the portable luminaire regulations in place.



# CHAPTER 1:

## Background and Justification

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### California Appliance Efficiency Standards

Portable luminaires have been a regulated appliance type in the Title 20 Appliance Efficiency Regulations since January 1, 2010 (Rulemaking 08-AAER-01A adopted on December 3, 2008). The term “portable luminaire” covers lighting products like desk lamps, table lamps, floor lamps, and other similar lights with a flexible cord. The performance standards for portable luminaires include five compliance pathways, requiring the product to be:

1. Equipped with a fluorescent lamp socket and ballast.
2. Equipped with GU24 socket that is not rated for use with incandescent lamps.
3. A light-emitting diode (LED) luminaire and comply with specific performance standards.
4. Packaged and sold with a LED or compact fluorescent light (CFL) bulb (“bulb-in-box”) (only specific bases).
5. Equipped with non-screw-based, less than 100W halogen lamp sockets and a dimmer.

In addition, there is a zero standby power performance standard for all portable luminaires that have an internal power supply. The standby power must be zero when the product is turned off.

These performance standards were to encourage the use of energy-efficient lighting in a portable luminaire. Four of the five compliance pathways listed above were designed to discourage or prevent the use of screw-based incandescent lamps (light bulbs), which were popular at the time. Of the five compliance pathways, the “bulb-in-box” pathway is most used by manufacturers. According to data from the Modernized Appliance Efficiency Database System (MAEDbS), about 88 percent of all portable luminaires certified in MAEDbS have used this compliance pathway. Manufacturers are required to identify which pathway they chose when they self-certify their portable luminaires to MAEDbS.

The “bulb-in-box” compliance pathway is found in California Code of Regulations (CCR), Title 20, section 1605.3(n)(3)(A)4. It requires that an LED or CFL lamp be packaged with the portable luminaire if the product uses E12, E17, or E26 base sockets (one lamp per socket). In addition, the LED or CFL lamp that is packaged with the product must be compliant under its own respective appliance standards. LED lamps are regulated as “state-regulated LED lamps” and CFLs are regulated as “general service lamps” under the Appliance Efficiency Regulations. As a result of this “bulb-in-box” standard, compliant portable luminaires being sold in California with E12, E17, or E26 base sockets come with LED or CFL lamps in the package.

Also adopted in 2008 were testing requirements for portable luminaires that exist in CCR, Title 20, section 1604(n)(4). For portable luminaires that use LED lamps, the required test method is 10 Code of Federal Regulations (CFR) section 430.23(ee) (Appendix BB to subpart B of part 430). For portable luminaires that use LED light engines, the required test method is California Joint Appendix JA8 - 2008, “Testing of Light Emitting Diode Light Sources,” or IES LM-79-08, “Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products,” at the manufacturer's option.



Since the original adoption of these standards in 2008, only one change has been made to the portable luminaire requirements. In a 2020 appliance efficiency rulemaking (Docket 20-AAER-01), the minimum lumen output requirement was removed from CCR, Title 20, section 1605.3(n)(3). This performance standard required that LED light engines and luminaires provide a light output of at least 200 lumens. Staff proposed to remove this standard since not all lighting applications benefit from a lumen output of 200 lumens or more. A product that produces more light than necessary leads to increased energy use. This appliance efficiency rulemaking was adopted in 2020, and the changes went into effect on March 16, 2021.

## **Subsequent Lighting Standards**

Following the portable luminaire rulemaking in 2008, there have been two rulemakings for other relevant lighting products. The first rulemaking was for “state-regulated LED lamps” and “state-regulated small diameter directional lamps.” This appliance efficiency rulemaking (Docket 15-AAER-06) was adopted on January 27, 2016, and went into effect on January 1, 2018. The changes included new definitions and testing, marking, certification, and performance requirements for these two appliance types. Regulated lamps that are compliant with these standards must meet minimum energy efficiency and quality standards, such as meeting a minimum color rendering index (CRI) requirement. The definitions of state-regulated LED lamps and small diameter lamps cover most common types of LED lamps and directional lamps.

The second rulemaking established performance standards for “general service lamps.” This rulemaking (Docket 19-AAER-04) was adopted November 13, 2019, and went into effect January 1, 2020. The scope of a “general service lamp” is broad and covers almost all types of light bulbs that are not already covered under another appliance type in the Appliance Efficiency Regulations. This scope includes most incandescent lamps, halogens, LEDs, and CFLs. The performance standard for general service lamps requires the lamp to have an efficacy of 45 lumens per watt. This standard is effectively impossible to meet for lamps that use incandescent technology. As a result, most incandescent lamps cannot be sold in California since they do not comply with the performance standard. The effective date of January 1, 2020, prohibited noncompliant lamps from being sold starting on this date. Retailers could not legally sell off their remaining inventory of non-compliant lamps after the requirements went into effect.

## **Justification for Repeal of Portable Luminaires**

Today, a consumer looking to buy replacement lamps for their portable luminaire would have extreme difficulty finding inefficient lamps. This market transformation is due in part to the lighting rulemakings which were discussed earlier for general service lamps and for state-regulated LED and small diameter directional lamps. General use incandescent lamps have been eliminated from California stores. The inefficient incandescent technology cannot comply with the existing performance standards for general service lamps (which apply to portable luminaires) in the Appliance Efficiency Regulations and LED and CFL lamps have filled in this market share. LEDs’ market share is growing more rapidly compared to the CFL’s because typically LEDs provide better lighting and performance qualities and are more energy efficient. These better attributes are ensured through state regulations in California. For this reason, most portable luminaires sold in California are expected to use LED lighting technology.

Four of the five compliance pathways for portable luminaires were designed to discourage or prevent the use of screw-based incandescent lamps that were popular at the time. The general service lamp regulations now have this effect. The other remaining compliance pathway for portable luminaires pertains to LED luminaires. Most LED portable luminaires are not covered under other Title 20 regulations (such as products that use integrated LEDs rather than LED lamps). However, with the advancements in LED technology in recent years, most of the required standards, except for the minimum power factor requirement, are redundant because they are met by almost all LEDs. Although the required minimum power factor standard is not very stringent, some portable luminaires on the market might not meet this requirement. However, the benefit of this requirement alone is negligible for consumers, especially for a small load such as a LED luminaire.

Lastly, requiring zero standby power for portable luminaires that have internal power supplies when the luminaire is turned off is eliminating some multifunctional products with popular utilities developed in recent years, such as desk lamps with wireless chargers, from the California market. Thus, removing this performance standard along with the other portable luminaire regulations would be beneficial.

The intended goals of the portable luminaire performance regulations are now accomplished through the more recent lighting regulations in the Title 20 Appliance Efficiency Regulations. Removal of the portable luminaire requirements would have no effect on the energy performance of these products. These products are now energy-efficient due to the existing lighting market in California.

## **CHAPTER 2:**

# **Proposed Changes for Portable Luminaires**

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The proposed changes would remove all information and requirements related to the portable luminaire appliance type in the Appliance Efficiency Regulations. No new text will be added, and no existing text regarding any other appliance type will be removed. The proposed updates are proposed to take effect on filing with the California Secretary of State.

### **Scope**

The proposed change to the scope removes portable luminaries as a regulated appliance type. The appliance name would be removed from CCR, Title 20, section 1601(n), indicating that portable luminaires are not included in the Appliance Efficiency Regulations.

### **Definitions**

The proposed changes to the definitions in CCR, Title 20, section 1602(n), include the removal of the following definitions. These definitions relate to the portable luminaire appliance type only. The removal of these definitions will not affect any other regulated appliance type. Those definitions proposed for removal are:

- "Art work luminaire"
- "Dedicated fluorescent lamp socket"
- "E12 screw-based socket"
- "E17 screw-based socket"
- "E26 screw-based socket"
- "General lighting application"
- "LED array or module"
- "LED lamp, integrated"
- "LED lamp, non-integrated"
- "LED luminaire"
- "LED package"
- "Luminaire efficacy"
- "Portable floor luminaire"
- "Portable luminaire"
- "Portable table luminaire"
- "Wall mount adjustable luminaire"

No other definitions are proposed to be added, amended, or removed.

### **Testing Requirements**

The existing testing requirements for portable luminaires are proposed to be removed. The existing requirements in CCR, Title 20, section 1604(n)(4), read:

"(4) Portable Luminaires.

- (A) The test methods for LED luminaires using LED lamps are shown in section 1604(k)(3) of this Article.
- (B) The test methods for LED luminaires using LED light engines are California Joint Appendix JA8 - 2008, "Testing of Light Emitting Diode Light Sources," or IES LM-79-08, "Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products," at manufacturer's option."

## Performance Standards

All existing performance standards for portable luminaires are proposed to be removed. The portable luminaire standards located in CCR, Title 20, section 1605.3(n)(3), read:

### "(3) Portable Luminaires.

- (A) Portable luminaires manufactured on or after January 1, 2010 shall meet one or more of the following requirements:
  1. Be equipped with a dedicated fluorescent lamp socket connected to a high frequency electronic ballast contained within the portable luminaire;
  2. Be equipped with one or more GU24 line-voltage sockets and not rated for use with incandescent lamps of any type, including line voltage or low voltage;
  3. Be an LED luminaire or a portable luminaire with an LED light engine with integral heat sink, and comply with the minimum requirements shown in Table N-3;

**Table N-3: Minimum Requirements for Portable LED Luminaires, and Portable Luminaires With LED Light Engines With Integral Heat Sink**

<i>Criteria</i>	<i>Requirement</i>
Minimum LED Luminaire Efficacy	29 lumens/W
Minimum LED Light Engine Efficacy	40 lumens/W
Correlated Color Temperature (CCT)	2700K through 5000K
Minimum Color Rendering Index (CRI)	75
Power Factor (for luminaires labeled or sold for residential use)	≥ 0.70

4. Be equipped with an E12, E17, or E26 screw-based socket and be prepackaged and sold together with one screw-based compact fluorescent lamp or screw-based LED lamp for each screw-based socket on the portable luminaire. The compact fluorescent or LED lamps which are prepackaged with the portable luminaire shall be fully compatible with the luminaire controls, meaning that portable luminaires having a dimmer control shall be prepackaged with dimmable compact fluorescent or LED lamps, and portable luminaires having 3-way controls shall be prepackaged with 3-way compact fluorescent or LED lamps. The compact fluorescent lamps which are prepackaged with the luminaires shall also meet the minimum energy efficiency levels established by ENERGY STAR® for compact fluorescent lamps in effect on December 31, 2008. The LED lamps required to be packaged with the luminaire shall comply with the minimum requirements for state-regulated LED lamps in sections 1601 through 1607 of this Article;

5. Be equipped with one or more single-ended, non-screw based halogen lamp sockets (line or low voltage), a dimmer control or high low control, and be rated for a maximum of 100W.

EXCEPTIONS to section 1605.3(n)(3) of this Article. The following portable luminaires are not required to be prepackaged and sold together with compact fluorescent or LED lamps:

1. Portable wall mount adjustable luminaires that meet all of the following requirements: Designed only to be mounted on a wall, having no base which will allow the luminaire to stand on a horizontal surface, having an articulated arm, having a maximum overall length of 24 inches in any direction, fitted only with a single E12, E17 or E26 lamp socket per luminaire, and controlled with an integral dimmer. Luminaires manufactured on or before December 31, 2011 shall have a maximum relamping rated wattage of 57 watts, and luminaires manufactured on or after January 1, 2012 shall have a maximum relamping rated wattage of 43 watts, as listed on a permanent pre-printed factory-installed label in accordance with Underwriters Laboratories (UL) 153.
2. Art work luminaires that meet all of the following requirements: Designed only to be mounted directly to art work only for the purpose of illuminating that art work, fitted only with E12 screw-base line-voltage sockets, having no more than three sockets per luminaire, and controlled with an integral high/low switch. Luminaires with a single socket shall have a maximum relamping rated wattage of 25 watts, and luminaires with two or three sockets shall have a maximum relamping rated wattage of 15 watts per socket, as listed on a permanent pre-printed factory-installed label in accordance with Underwriters Laboratories (UL) 153.

(B) Portable luminaires that have internal power supplies shall have zero standby power when the luminaire is turned off.”

## **Marking Requirements**

As a result of these proposed changes, portable luminaires would no longer be required to comply with the marking requirements in the Appliance Efficiency Regulations. Existing text in CCR, Title 20, section 1607(a), states that the marking requirements apply to every appliance within the scope of CCR, Title 20, section 1601. Portable luminaires are proposed to be removed from CCR, Title 20, section 1601, therefore removing the need for this appliance to comply with the marking requirements.

The existing general marking requirements, required for all regulated appliances, would no longer apply to portable luminaires. These general marking are found in CCR, Title 20, section 1607(b).

There are no existing marking requirements that are specific to only portable luminaires, and portable luminaires are not specifically referenced anywhere in CCR, Title 20, section 1607. As a result, there are no proposed changes to the text regarding marking requirements.

## **Certification Requirements**

Certification is how compliance with the Appliance Efficiency Regulations is verified. Manufacturers certify their product data to MAEDbS to demonstrate compliance. The proposed

changes include the removal of all certification requirements for portable luminaires. Since this appliance type is proposed to be removed in the scope of the Appliance Efficiency Regulations, certification will no longer be necessary.

The specific data fields that are required to be submitted for certification are listed in Table X of CCR, Title 20, section 1606(a), organized by appliance type. Within Table X, staff proposes removing the portable luminaire appliance type along with the 11 data fields associated with it. Those data fields are:

- Type of portable luminaire
- Total number of lamp sockets
- Base type
- Compliance method used
- Zero standby power (for luminaires with internal power supplies only)
- GU24 sockets rated (for use with incandescent lamps for luminaires with GU24 sockets only)
- LED light output (for LED luminaires only)
- LED Efficacy (for LED luminaires only)
- Nominal correlated color temperature (for LED luminaires only)
- Color rendering index (for LED luminaires only)
- Power Factor (for LED luminaires labeled or sold for residential use only)

If these proposed changes were to be adopted, the portable luminaire appliance type would be removed from MAEDbS, and future submissions would no longer be necessary or possible. All models of portable luminaires listed in MAEDbS as approved would be archived for historical, statistical, or academic purposes.

## **CHAPTER 3:**

# **Savings and Cost Analysis**

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The existing portable luminaire regulations do not require product design improvements or any additional energy savings beyond what is required or provided through other more recent lighting regulations. Therefore, the proposed removal of the portable luminaire regulations does not have any cost or energy consumption impacts. The removal of the “bulb-in-box” requirement would give manufacturers the option of not packaging a lamp with specific portable luminaires. However, since a lamp is required for those products to function, a lamp will still need to be purchased regardless of the regulations. If a lamp is not included in the package, the consumer will pay the cost of the lamp. If a lamp is included, the manufacturer would pay the cost but then pass that cost on to the consumer. Therefore, removing the portable luminaire standards would have no impact on the overall cost of the product.

## **CHAPTER 4:**

# **Environmental Impacts**

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The proposed regulations would repeal portable luminaires as a regulated appliance type in the Appliance Efficiency Regulations. The repeal of the requirements will not affect the sale of portable luminaires in California. Portable luminaires, along with the LED or CFL lamps used with them, can continue to be sold, and similarly, the lighting components of these products continue to be subject to existing regulations. As discussed in Chapter 1 of this document, inefficient portable luminaires are already eliminated from the market due to other appliance regulations. The existing requirements have negligible impact on the number of portable luminaires sold in the state, and because of existing overlapping regulations, removal of these requirements will not cause any changes to the way these products are designed. As stated above, regulations for portable luminaires presently overlap with other, existing requirements. Therefore, staff has not identified any adverse or beneficial environmental impacts from the proposed repeal.

### **Energy Impacts**

The proposed repeal will have a negligible (if any) impact on the performance of portable luminaires, yielding no energy savings nor a reduction in energy savings, translating to neither an increase or a reduction in greenhouse gas and criteria pollutant emissions.

### **Environmental Impacts**

The proposed repeal is not expected to result in any changes to the product design or the number of the products added or removed from the market. Therefore, no environmental impacts are expected.



# GLOSSARY

<b><u>Term</u></b>	<b><u>Definition</u></b>
Color rendering index	The measured degree of color shift objects undergo when illuminated by a light source as compared with the color of those same objects when illuminated by a reference source of comparable color temperature, as determined using the applicable test method in section 1604(k) of this Article.
General service lamp	<p>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:</p> <ul style="list-style-type: none"> <li>(1) Appliance lamps;</li> <li>(2) Black light lamps;</li> <li>(3) Bug lamps;</li> <li>(4) Colored lamps;</li> <li>(5) G shape lamps with a diameter of 5 inches or more as defined in ANSI C79.1-2002;</li> <li>(6) General service fluorescent lamps;</li> <li>(7) High intensity discharge lamps;</li> <li>(8) Infrared lamps;</li> <li>(9) J, JC, JCD, JCS, JCV, JCX, JD, JS, and JT shape lamps that do not have Edison screw bases;</li> <li>(10) Lamps that have a wedge base or prefocus base;</li> <li>(11) Left-hand thread lamps;</li> <li>(12) Marine lamps;</li> <li>(13) Marine signal service lamps;</li> <li>(14) Mine service lamps;</li> <li>(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;</li> </ul> <p>...</p>

<b><u>Term</u></b>	<b><u>Definition</u></b>
General service lamp (cont.)	<p>...(cont.)</p> <p>(16) Other fluorescent lamps;</p> <p>(17) Plant light lamps;</p> <p>(18) R20 short lamps;</p> <p>(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;</p> <p>(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;</p> <p>(21) Sign service lamps;</p> <p>(22) Silver bowl lamps;</p> <p>(23) Showcase lamps;</p> <p>(24) Specialty MR lamps;</p> <p>(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;</p> <p>(26) Traffic signal lamps.</p>
GU24 socket	A socket on a lighting product designed to only accept lamps with GU24 pin bases.
MAEDbS	The Modernized Appliance Efficiency Database System established pursuant to section 1606(c) and maintained by the California Energy Commission (CEC).
Manufacturer	Any person engaged in the original production or assembly of an appliance or commercial and industrial equipment or any person that assumes the complete legal responsibility for the original production or assembly of an appliance, which includes, but is not limited to, the responsibility normally held by the manufacturer for product liability, warranty, and compliance with state and federal law. "Manufacturer" also means a private brand packager or reassembler.

<b><u>Term</u></b>	<b><u>Definition</u></b>
Portable luminaire	<p>A luminaire that has a flexible cord and an attachment plug for connection to a nominal 120-volt, 15- or 20-ampere branch circuit; that allows the user to relocate the luminaire without any rewiring; that are typically controlled with a switch located on the luminaire itself or on the power cord; and that are intended for use in accordance with the National Electrical Code, ANSI/NFPA 70-2002. Portable luminaire does not include any of the following:</p> <ul style="list-style-type: none"> <li>(1) Direct plug-in nightlights;</li> <li>(2) Sun and heat lamps;</li> <li>(3) Aquarium lamps;</li> <li>(4) Medical and dental lights;</li> <li>(5) Portable electric hand lamps;</li> <li>(6) Signs and commercial advertising displays;</li> <li>(7) Photographic lamps;</li> <li>(8) Germicidal lamps;</li> <li>(9) Illuminated vanity mirrors;</li> <li>(10) Lava lamps not providing general or task illumination;</li> <li>(11) Industrial work lights rated for use with lamps providing greater than 7,000 lumens;</li> <li>(12) Portable luminaires for marine use or for use in hazardous locations as defined in the National Electrical Code, ANSI/NFPA 70;</li> <li>(13) Christmas tree and decorative lighting outfits or electric candles and candelabras without lamp shades that are covered by the Standard for Christmas Tree and Decorative Outfits, UL 588.</li> </ul>
State-Regulated Light Emitting Diode (LED) Lamp	<p>A lamp capable of producing light with Duv between -0.012 and 0.012, and that has an E12, E17, E26, or GU24 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 2200K and 7000K.</p>

<b><u>Term</u></b>	<b><u>Definition</u></b>
State-Regulated Small Diameter Directional Lamp	<p>A directional lamp that meets all of the following criteria:</p> <ul style="list-style-type: none"> <li>(1) Capable of operating at 12 volts, 24 volts, or 120 volts;</li> <li>(2) Has an ANSI ANSLG C81.61-2009 (R2014) compliant pin base or E26 base;</li> <li>(3) Is a non-tubular directional lamp with a diameter of less than or equal to 2.25 inches;</li> <li>(4) Has a lumen output of less than or equal to 850 lumens, or has a wattage of 75 watts or less; and</li> <li>(5) Has a rated life greater than 300 hours.</li> </ul> <p>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 LEDs and are covered under the definition of state-regulated light emitting diode lamps.</p>

# APPENDIX A:

## Acronyms

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<b><u>Acronym</u></b>	<b><u>Description</u></b>
CCR	California Code of Regulations
CEC	California Energy Commission
CFL	Compact Fluorescent Lamp
CFR	Code of Federal Regulations
CRI	Color Rendering Index
LED	Light Emitting Diode
MAEDbS	Modernized Appliance Efficiency Database System