TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Page

Residential Lighting

Overview

Please refer to Chapter 6.1 of the *2022 Single-family Residential Compliance Manual*.

Scope

Please refer to Chapter 6.1.2 of the *2022 Single-family Residential Compliance Manual*.

Related Resources

The California Energy Commission and others prepare educational resources with information about residential lighting. The Energy Commission's online resources can be found at the Energy Code Support Center at https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/energy-code-support-center.

Luminaire Requirements

A luminaire, also known as a light fixture, is defined by §100.1 as a complete lighting unit consisting of a light source, such as a lamp or lamps, and the parts that distribute the light, position and protect the light source, and connect it to the power supply.

A lamp is a light bulb or similar separable lighting component. It is defined by §100.1 as an electrical appliance that produces optical radiation for visual illumination, with a base to provide an electrical connection between the lamp and a luminaire, and to be installed into a luminaire. The definition clarifies that a lamp is not a luminaire and is not an LED retrofit kit designed to replace components of a luminaire.

The 2025 Energy Code for residential lighting requires all installed luminaires and light sources to comply with the requirements of Reference Joint Appendix JA8 (aka JA8).

The installed luminaires are permanently installed lighting as defined in §100.1 as luminaires that are affixed to land. Examples of permanently installed lighting include:

- Lighting attached to walls, ceilings, or columns.
- Track and flexible lighting systems.
- Lighting inside permanently installed cabinets.
- Lighting attached to the top or bottom of permanently installed cabinets.

The following are examples of non-permanently installed lighting:

- Portable lighting as defined by §100.1 (including, but not limited to, table and freestanding floor lamps with plug-in connections).
- Lighting installed by the manufacturer in refrigerators, stoves, microwave ovens, exhaust hoods for cooking equipment, refrigerated cases, vending machines, food preparation equipment, and scientific and industrial equipment.

The following are not required to be certified and marked as required by JA8 (Section 150.0(k):

- Lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers. Ceiling fan light kits that are subject to DOE's Appliance and Equipment Standards Program.
- Navigation lighting rated less than 5 watts, such as night lights, step lights, and path lights.
- Lighting with an efficacy of 45 lumens per watt or greater and located inside drawers, cabinetry, and linen closets.
- LED light sources that are installed outdoors.
- Inseparable solid-state lighting (SSL) luminaires containing colored light sources for decorative lighting purpose.
- High intensity discharge (HID) light sources, including pulse-start metal halide luminaires and high pressure sodium luminaires.
- Luminaires with induction lamp and hardwired high frequency generator.

There are luminaires that must use JA8-certified light sources or lamps (See Residential Luminaires – Reference Joint Appendix JA8 Certified Light Sources), recessed downlight luminaires in ceilings (See Recessed Downlight Luminaires in Ceilings), and luminaires that are not required to be certified for meeting JA8.

Residential Luminaires – Reference Joint Appendix JA8 Certified Light Sources

Luminaires not listed in Luminaire Requirements must have an integral light source or removable lamp that meets the performance requirements of JA8. The requirements in JA8 ensure that new lighting technologies, like LEDs, provide energy-efficient light, while also maintaining performance characteristics that customers expect. In addition to setting minimum efficacy requirements, JA8 establishes performance requirements that ensure accurate color rendition, dimmability, and reduced noise and flicker during operation.

Luminaires with integral sources, such as LED luminaires, must be certified to the Energy Commission as meeting the JA8 requirements. Changeable lamps, such as those in screw-base luminaires, must also be certified to the Energy Commission.

Luminaires and lamps certified to the Energy Commission must be labeled with JA8-2025 or JA8-2025-E on the product. The JA8-2025-E marking indicates that the lamp product or the LED light engine product has been certified for passing the federal test at elevated temperature. This test ensures that the light source is appropriate for elevated temperature applications such as installation in enclosed or recessed luminaires.

Luminaires that can be classified as high luminous efficacy by meeting the requirements of JA8 include:

- LED luminaires with integral light sources that are JA8-certified.
- Ceiling recessed downlight luminaires with JA8-certified light sources (the luminaire must not contain screw-based lamp sockets).
- Low-voltage pin-based luminaires with JA8-certified lamps.

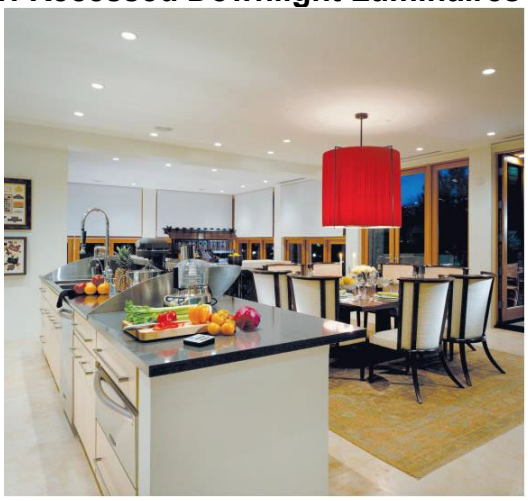
Almost any luminaire can be classified as high luminous efficacy if it is installed with a JA8 certified lamp or light source. The exception is recessed downlight luminaires in ceilings, which must meet additional requirements.

The Energy Commission maintains a database of certified JA8 certified luminaires, lamps, and light sources. The database can be accessed using a quick search tool at https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx or an advanced search at https://cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx.

Recessed Downlight Luminaires in Ceilings

In addition to the luminaire efficacy requirements, there are several additional requirements for residential downlight luminaires that are mounted in ceilings.

Figure 6-1: Recessed Downlight Luminaires in Ceiling



Source: Image Courtesy of Lutron Electronics Co., Inc.

Recessed downlight luminaires are limited to specific light sources and lamp types. Recessed downlight luminaires must not contain screw-based lamps and the light source must be marked with "JA8-2025-E" showing meeting the elevated temperature requirement.

All recessed downlight luminaires must contain a light source or lamp that is JA8 certified, such as an integral LED source or LED lamp. Screw-based lamps such as LED A-lamps or LED PAR lamps are not allowed. Pin-based lamps such as LED MR-16 lamps are allowed in recessed luminaires as long as they are JA8 certified.

In addition to the light source and lamp requirements listed, recessed downlight luminaires in ceilings must also meet all the following performance requirements:

- Have a label that certifies the luminaire is airtight with air leakage less than 2.0 cubic feet per minute (cfm) at 75 Pascals when tested in accordance with ASTM E283 (exhaust fan housings with integral light are not required to be certified airtight); and
- Be sealed with a gasket or caulk between the luminaire housing and ceiling, and have all air leak paths between conditioned and unconditioned spaces sealed with a gasket or caulk, or be installed per manufacturer's instructions to maintain airtightness between the luminaire housing and ceiling; and
- Meet the clearance and installation requirements of California Electrical Code Article 410.116 for recessed luminaires which requires the following:

- A recessed luminaire that is not identified for contact with insulation, non-Type IC, shall have all recessed parts spaced not less than 1/2 inch from combustible materials. The points of support and the trim finishing off the openings in the ceiling shall be permitted to be in contact with combustible materials.
- A recessed luminaire that is identified for contact with insulation, Type IC, shall be permitted to be in contact with combustible materials at recessed parts, points of support, and portions passing through or finishing off the opening in the building structure.
- Thermal insulation shall not be installed above a recessed luminaire or within 3 inches of the recessed luminaire's enclosure, wiring compartment, ballast, transformer, LED driver, or power supply unless the luminaire is identified as Type IC for insulation contact.

Luminaires that meet the air leakage requirement or luminaires that are Type IC rated will have this information listed on luminaire cut sheets or packaging.

Installers are responsible for ensuring that luminaires are properly sealed to prevent air leakage between the luminaire housing and ceiling.

Recessed luminaires that are marked for use in fire-rated installations and recessed luminaires installed in non-insulated ceilings are exempt from the air leakage requirement and sealing requirement, however, they must meet all other requirements for recessed luminaires.

Figure 6-2: Recessed Luminaire with an IC Housing (left); Recessed Luminaire with Non-IC Housing (right)

Source: Image Courtesy of Lutron Electronics Co., Inc.

Enclosed Luminaires and Recessed Luminaires Other than Ceiling Recessed Downlight Luminaires

Lamps and other separable light sources in enclosed luminaires and recessed luminaires (other than ceiling-recessed downlights) must be in compliance with the federal time-to-failure test requirement specified in Joint Appendix JA8.5 and as mentioned in Chapter 7. The JA8-compliant lamps and light sources must be marked with "JA8-2025-E" to signify that they are suitable to be installed in an enclosed or recessed luminaire.

Navigation Lighting – Night Lights, Step Lights and Path Lights

Navigation lighting such as night lights, step lights, and path lights must either:

- Be rated to consume no more than 4 watts; or
- Comply with luminaire efficacy requirements in §150.0(k)1A.

Lighting in Drawers, Cabinets, and Linen Closets

Luminaires or light sources internal to drawers, cabinets, and linen closets must either:

- Have an efficacy of 45 lumens per watt or greater or
- Comply with luminaire efficacy requirements in §150.0(k)1A.

Example 6-1: Screw-based luminaires

Question

I am using a screw-based luminaire that is rated to take a 60W lamp for lighting over a sink, and I plan to install a 10W LED lamp. Does it meet the residential lighting requirement for screw-based luminaires?

Answer

If the LED lamp is JA8-certified and marked JA8-2025 or JA8-2025-E, then it meets the residential lighting requirement for screw-based luminaires in Energy Code §150.0(k)1B.

If the luminaire is a recessed luminaire in a ceiling, it would not comply since recessed luminaires cannot contain a screw base socket.

Example 6-2: Color-tunable and dim-to-warm luminaires installed in residential buildings

Question

Can color-tunable luminaires and dim-to-warm luminaires be certified to meet JA8 specifications?

Answer

JA8 includes color characteristic specifications for light sources.

The JA8 specifications require all light sources to be capable of providing color temperature (correlated color temperature, CCT) of 4000 Kelvin (K) or less.

JA8 also require light sources to provide color rendering index (CRI) of 90 or higher and R9 of 50 or higher. LED lamps regulated by the Title 20 Appliance Efficiency Regulations must have a CRI of 82 or higher.

If the color-tunable luminaire or dim-to-warm luminaire can provide a CCT of 4000k or less and provide CRI that meets these requirements, it meets the color characteristic criteria.

If all requirements of JA8 are met, including the color characteristic requirements, these light sources can be certified to meet JA8.

Example 6-3: Fade-in lighting

Question

I would like to use lighting with an aesthetic fade-in feature in my design. JA8 has a start time requirement. Are fade-in lights able to qualify as high efficacy?

Answer

Aesthetic fade-in lights are acceptable under Title 24. The test procedure for start time measures "[t]he time between the application of power to the device and the point where the light output reaches 98% of the lamp's initial plateau." The "initial plateau" is "[t]he point at which the average increase in the light output over time levels out(reduces in slope)."

For light sources with a fade-in feature, the light output intentionally follows a programmed fade-in curve to increase light output gradually. Because the light output must level out, the initial plateau for these light sources is the point in time at which there is perceived light output and the perceived light increase begins to follow the programmed fade-in curve. The programmed fade-in curve is expected to be continuously increasing as a function of time.

This allows fade-in lighting to qualify as high efficacy.

Example 6-4: Kitchen exhaust hood lighting

Question

I am installing an exhaust hood over my kitchen range that has lamps in it. Do these lamps have to be high efficacy?

Answer

This lighting is integrated into the appliance and does not have to meet the luminaire efficacy requirements for permanently installed lighting.

Example 6-5: Kitchen alterations

Question

I am designing a residential kitchen lighting system with six 12W LED recessed downlights and four 24W LED tape lights for under cabinet lighting. How many watts of incandescent or halogen luminaires can be installed?

Answer

There are no wattage limitations for residential lighting. However, all luminaires must meet the luminaire efficacy requirements in §150.0(k)1A of the Energy Code. Incandescent and halogen light sources may not be able to meet the requirements of JA8, thus may not be able to be installed for Energy Code compliance.

Example 6-6: Night lights

Question

Where are night lights permitted to be installed in residential buildings?

Answer

There are no location restrictions in the Energy Code. Permanently installed night lights and night lights integral to installed luminaires can be installed anywhere in single family buildings, or other residential spaces.

Blank Electrical Boxes

Please refer to Chapter 6.2.8 of the *2022 Single-family Residential Compliance Manual*.

Indoor Lighting Control Requirements

Lighting controls are an important part of the Energy Code because they can produce energy savings for the owners and users of the spaces. Lighting Control Requirements in Accordance with Room and Luminaire Types

All lighting controls must comply with the mandatory requirements of §110.9. Following are general control requirements that apply for the room type and for the luminaire type.

Readily Accessible Manual Controls

A wall-mounted controls must be installed to manually turned on and off all permanently installed luminaires, and the wall-mounted controls must be "readily accessible". "Readily accessible" – as defined in §100.1 - means capable of being reached quickly for operation, repair, or inspection without requiring climbing or removing obstacles, or resorting to access equipment.

Multiple Switches

A lighting circuit can be controlled by more than one switch, such as by three-way or four-way switches. For a lighting circuit with multiple switches, where a dimmer or vacancy sensor has been installed to comply with §150.0(k), the following requirements must be met:

- No controls shall bypass the dimmer, occupancy sensor, or vacancy sensor function.
- The dimmer or vacancy sensor must comply with the applicable requirements of §110.9(b).

Controls Permitted – Energy Management Control Systems (EMCS) and Multiscene Programmable Controllers

An EMCS or a multiscene programmable controller can be installed to meet the dimming, occupancy, and lighting control requirements in §150.0(k)2 if it provides the functionality of the specified controls in accordance with §110.9, and the physical controls specified in §150.0(k)2A. No controls shall bypass control functions of a dimmer, occupant sensor, or vacancy sensor where the dimmer or sensor has been installed to comply with Section 150.0(k)2.

Exhaust Fan Integrated Lighting

Integrated lighting in an exhaust fan must be controlled independently from the fan to comply with Section 150.0(k)2G.

Lighting in Drawers and Cabinets

Undercabinet lighting, undershelf lighting, and interior lighting of display cabinets must be controlled independently from ceiling-installed lighting such that one can be turned on without turning on the other to comply with Section 150.0(k)2G.

Drawers and cabinetry with internal lights and opaque fronts or doors must have controls that turn the lights off when the drawer or door is closed.

Ceiling Fan Lighting

Ceiling fans with integrated light sources can be controlled with a remote control for ON, OFF, and dimming control. The remote control does not need to be wall mounted.

Automatic-off Controls – Vacancy Sensors or Occupancy Sensors

The following residential spaces are required to have at least one installed luminaire in the space to be controlled by an occupancy or vacancy sensor providing automatic-off functionality:

- Bathrooms
- Garages
- Laundry Rooms
- Utility Rooms
- Walk-in Closets

Dimming Controls

Lighting in habitable spaces such as living rooms, dining rooms, kitchens, and bedrooms must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down to comply with Section 150.0(k)2F.

The following are not required for meeting the dimming controls requirements:

- Ceiling fans may provide control of integrated lighting via a remote control.
- Lighting integral to kitchen range hoods and bathroom exhaust fans.
- Luminaires connected to a circuit with controlled lighting power less than 20 watts or controlled by an occupancy or vacancy sensor providing automatic-off functionality.
- Navigation lighting such as night lights, step lights, and path lights less than 5 watts; and lighting with automatic off controls that is internal to drawers and cabinetry with opaque fronts or doors.

Note that when a forward phase-cut dimmers is installed to control LED light sources, the dimmer is required to be rated as NEMA SSL 7A. A NEMA SSL 7A-compliant dimmer ensures a flicker-free operation when the LED luminaire is dimmed. The dimmer/light source compatibility information is usually included on dimmer cut sheets or dimmer product packaging.

Example 6-7: Using vacancy sensors and dimmers

Question

Can I install vacancy sensors and dimmers in hallways and non-walk-in closets even though the Energy Code does not require it?

Answer

Installing controls such as vacancy sensors and dimmers in hallways and closets is allowed.

A vacancy sensor automatically turns lighting off when a space is unoccupied. This can save energy compared to a manual on-off switch where the light may be left on while the space is unoccupied.

Using vacancy sensors is recommended for any application where they can provide additional energy savings for the homeowner or occupant.

A dimmer varies the intensity of the light to suit the occasion or the time of day. When less light is needed, the homeowner can reduce the light intensity with a dimmer to save energy.

Lighting Control Functionality

Please refer to Chapter 6.3.1 of the *2022 Single-family Residential Compliance Manual*.

Residential Outdoor Lighting Requirements

Outdoor lighting permanently mounted to a residential building or to other buildings on the same lot are subject to the outdoor lighting requirements. This includes lighting for patios, entrances, balconies, and porches.

Outdoor lighting not permanently attached to a building on a single-family site, such as decorative landscape lighting, is not regulated by the residential lighting requirements. LED lighting and controls such as a time clock or photocontrol will save energy and ensure that lighting is not accidentally left on during daylight hours.

Outdoor Luminaires

Outdoor LED luminaires and LED light sources installed outdoors are not required to comply with Joint Appendix JA8.

Outdoor Lighting Controls

Outdoor lighting must be controlled by a manual ON and OFF control switch and one of the following automatic controls in accordance with 150.0(k)3:

- A photocell and a motion sensor; or
- A photocell and an automatic time switch control; or
- An astronomical time clock control.

Any override that keeps the above automatic controls to "ON" must return to automatic control operations within six hours.

As alternative to the above mentioned controls (manual on and off control and the automatic controls), an EMCS can be used to control outdoor lighting, provided that the EMCS can provide the control functionalities - including the override - of the above mentioned controls.

Internally Illuminated Address Signs

Please refer to Chapter 6.4.3 of the *2022 Single-family Residential Compliance Manual*.

Example 6-8: Outdoor lighting: glare control

Question

Are there luminaire cutoff requirements for residential outdoor luminaires?

Answer

There are no luminaire cutoff requirements for residential outdoor lighting. Even though not required for most residential outdoor lighting, luminaires that limit uplight are usually more

efficient at providing lighting in the required area, allowing a lower wattage luminaire to be used. Backlight, uplight, and glare requirements also reduce stray light and glare problems which can cause visual discomfort.

Example 6-9: Outdoor lighting: landscape lighting

Question

I would like to install low-voltage landscape lighting in my yard. Are these required to be controlled by a motion sensor and photocontrol?

Answer

No. The lighting requirements only apply to lighting that is attached to a building or structure. However, using photocontrols or astronomical time clock controls can save energy by ensuring that landscape lighting is not left on during daylight hours.

Residential Garages

Please refer to Chapter 6.5 of the *2022 Single-family Residential Compliance Manual*.

Additions and Alterations

Additions must meet the same requirements as newly constructed buildings. Because the residential lighting requirements are mandatory, lighting in residential additions must meet all applicable requirements of §150.0(k).

For residential alterations, any new or altered lighting systems must meet all applicable requirements of §150.0(k). Existing luminaires, controls, and lighting systems that are not altered may stay as is.

Where existing screw base sockets are present in ceiling-recessed luminaires, removal of these sockets is not required provided that new JA8 compliant trim kits or lamps designed for use with recessed downlights or luminaires are installed.

Compliance Documentation

Please refer to Chapter 6.7 of the *2022 Single-family Residential Compliance Manual*.

Certificate of Installation (C2FR-LTG)

The certificate of installation for lighting is the CF2R-LTG.

Person Responsible to Submit the Certificate of Installation

The individual responsible for constructing and installing the residential lighting project (Title 24 California Code of Regulations, Part 1, §10-103(a)3) must submit the certificate of installation. This individual must be eligible under Division 3 of the Business and Professions Code to accept responsibility for the installed lighting system. This individual must ensure the installed lighting system complies with the applicable lighting requirements before signing the certificate.

Number of Certificates of Installation Required

A residential lighting project may require more than one certificate to be submitted. If one qualified person accepts responsibility for the installation of an entire lighting project, one

certificate is needed. If one qualified person installs the lighting controls and another installs the luminaires, each person will need to submit a separate certificate.

A certificate must be submitted to the responsible code enforcement agency for any residential lighting project that is regulated by the Energy Code, whether that project includes installation of a single luminaire or installation of lighting for an entire building.

The responsible person or contractor installing permanently installed lighting must complete and sign the certificate. The responsible person or installer verifies whether high luminous efficacy lighting and the required controls (i.e., vacancy sensors, dimmer switches) were installed.

Registration

Registration is required for projects that require Energy Code Compliance (ECC) field verification (see Title 20 California Code of Regulations §1670 et seq.). When registration is required, the certificates must be submitted electronically to an approved ECC-Provider data registry for registration and retention.

Registration requirements are in Chapter 2. Lighting measures do not require ECC-Verification.

For Building Officials

Please refer to Chapter 6.8 of the *2022 Single-family Residential Compliance Manual*.

Plans

Please refer to Chapter 6.8.1 of the *2022 Single-family Residential Compliance Manual*.

Compliance Documentation

Confirm that all required compliance documentation is included with the plans.

Certificate of Installation

The certificate of installation (CF2R-LTG) is the primary compliance document for residential lighting. There will be one or more CF2R-LTG forms submitted for each project. Confirm all lighting systems and lighting controls in the project are covered by a CF2R-LTG. Confirm all CF2R-LTG forms are registered if the project requires ECC field verification and diagnostic testing. (ECC-Verification is not required for residential lighting, but registration is required if any project measures do require ECC-Verification.)

Lighting Schedule

Builders must submit a lighting schedule to homeowners or occupants at the time of occupancy. This schedule should describe all installed interior luminaires and lamps. A draft schedule should be included for the plan check. In addition to a list of installed lighting systems, provided documentation should include necessary system information for regular operations and maintenance.

For Manufacturers – Certification to the Energy Commission

The following are guidelines for manufacturers to ensure their lighting products meet residential lighting requirements of the Energy Standards:

Light source products (luminaires, lamps, and light sources) that are required to comply with Reference Joint Appendix JA8 shall be marked with JA8-2025 or JA8-2025-E.

For lighting control and light source products to be certified to the Energy Commission (as defined in §100.1), the manufacturer must comply with the requirements of certification. Certification can be done on the Energy Commission's Certifications Packets webpage which is https://www.energy.ca.gov/files/certification-packets-appliances. The procedures include filling out a certification packet and submitting a declaration of compliance, executed under penalty of perjury of the laws of California, that the regulated product meets the requirements.

Building departments, builders, installers, lighting designers, and specifiers are advised to use the MAEDBS database to verify that a regulated product has been certified to the Energy Commission by the manufacturer.

Luminaires do not need to be shipped with a JA8-certified lamp by manufacturers.

Luminaires, Lamps, and Other Light Sources Complying with JA8 and JA10

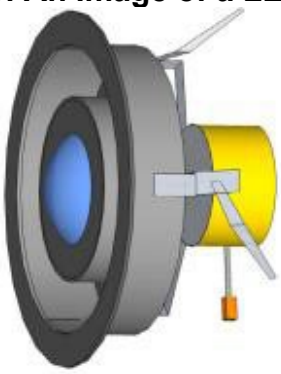
Joint Appendix JA8, "Qualification Requirements for High Luminous Efficacy Light

Sources," is a technical specification with requirements for luminaires, lamps, and light sources. JA8 specifies the performance requirements that light sources must meet, and the testing procedures that must be used to measure the performance metrics.

The elevated temperature life test requirement is optional as stated in JA8.5, and is required only for light source products intended for installation in enclosed or recessed luminaires. Light sources that have passed the "time to failure " portion of the federal test procedures specified in Appendix BB to Subpart B of 10 CFR 430 (2018) with a rated life of 15,000 hours or greater when the ambient temperature for the test is maintained at 45 °C ± 5°C tolerance or at a manufacturer-selected temperature higher than 45 °C with ± 5°C tolerance, can be marked with JA8-2025-E.

LED trim kit products like the one shown in Figure 6-3 do not need to be tested for the "time to failure" test procedure or marked with JA8-2025-E; however, they are still required to comply with JA8 and be marked with JA-8-2025.

Figure 6-3: An Image of a LED Trim Kit



Source: California Energy Commission

Joint Appendix JA10, "Test Method for Measuring Flicker of Lighting Systems and Reporting Requirements," is a supplement to the reduced flicker operation requirement of JA8. JA10 describes the test method to measure the flickering of light from the lighting system. The test

involves using signal processing to remove high frequency components and quantifies flicker as a percent amplitude modulation below a given cut- off frequency.

Marking Designation, and Product Data Required for JA8-Certified Luminaires, Lamps and Light Sources

JA8-certified products, including luminaires, lamps, and light sources, must be marked as meeting the requirement of Section JA8.5.

Table 6-1: Elevated Temperature Test Requirements for Certified JA8 Luminaires, Lamps and Light Sources shows different marking designations depending on the light source type.

Table 6-2: Data to be Submitted to the California Energy Commission to Meet JA8.6 shows the required data to be submitted to the Energy Commission for JA8 certification and for meeting JA8.6.

Table 6-1: Elevated Temperature Test Requirements for Certified JA8 Luminaires, Lamps and Light Sources

Light Source Type	Marking Designation	Testing Notes for Meeting the Lumen Maintenance and Rated Life Requirements
Lamps and light sources installed in enclosed or recessed luminaires	JA8-2025-E	Light sources must pass the "time to failure" portion of the DOE Standards test procedures in order for the light source to be marked with "JA8-2022-E".
Ceiling recessed downlight luminaires	JA8-2025	No elevated temperature test is required.
3.Light sources other than #1 and #2.	JA8-2025	No elevated temperature test is required.

Source: California Energy Commission

Table 6-2: Data to be Submitted to the California Energy Commission to Meet JA8.6

METRIC	JA8 REQUIREMENTS
Light source type	LED, OLED, , HID, Others (certifier to identify)
Product type	Omnidirectional lamp, Directional lamp, Decorative lamp, LED light engine, Inseparable SSL luminaire, T20 lamp, Others (certifier to identify such as tape light)

Lab accredited by NVLAP or accreditation body operating in accordance with ISO/IEC 17011	Yes
Initial luminous efficacy	≥ 45 lumens/W
Power factor at full rated power	≥ 0.90
Start time	≤ 0.5 sec
Correlated color temperature (CCT)	≤ 4000 K
Color rendering index (CRI)	≥ 90 for all products other than T20 lamps, or ≥ 82 for T20 lamps
Color rendering R9 (red)	≥ 50 for all products other than T20 lamps
Ambient or elevated temperature	Ambient or Elevated
Minimum dimming level	≤ 10%
Dimming control compatibility	At least one type (Forward Phase cut control, reverse phase cut, powerline carrier, digital, 0-10 VDC) must be listed in order to be certified for meeting JA8.
NEMA SSL 7A compatible?	If compatible with forward phase cut dimmer control, "Yes." If not, "NA."
FLICKER:	--
See JA10 Table 10-1 for flicker data requirements and permissible answers	< 30% for frequencies ≤ 200 Hz at 100% light output
See JA10 Table 10-1 for flicker data requirements and permissible answers	< 30% for frequencies ≤ 200 Hz at 20% light output
	--
AUDIBLE NOISE: 100% light output	≤ 24 Dba
AUDIBLE NOISE: 20% light output	≤ 24 Dba
MARKING:	--
Marked in accordance with JA8.5	(Marked as) "JA8-2025", or "JA8-2025-E"

Source: California Energy Commission