



What's Included in this Fact Sheet?

This fact sheet covers residential indoor and outdoor lighting technologies that are regulated by California's Building Energy Efficiency Standards (Title 24, Part 6 or Energy Code) and include high-efficacy luminaires, recessed can light specifications, vacancy or occupancy sensors, dimming and on/off switching control requirements.

The requirements in this fact sheet apply to single-family buildings, duplexes and townhomes. Residential lighting requirements also apply to dwelling units in multifamily buildings; guestrooms of hotels/motels; and dwelling spaces of fire stations, dormitories and senior housing.

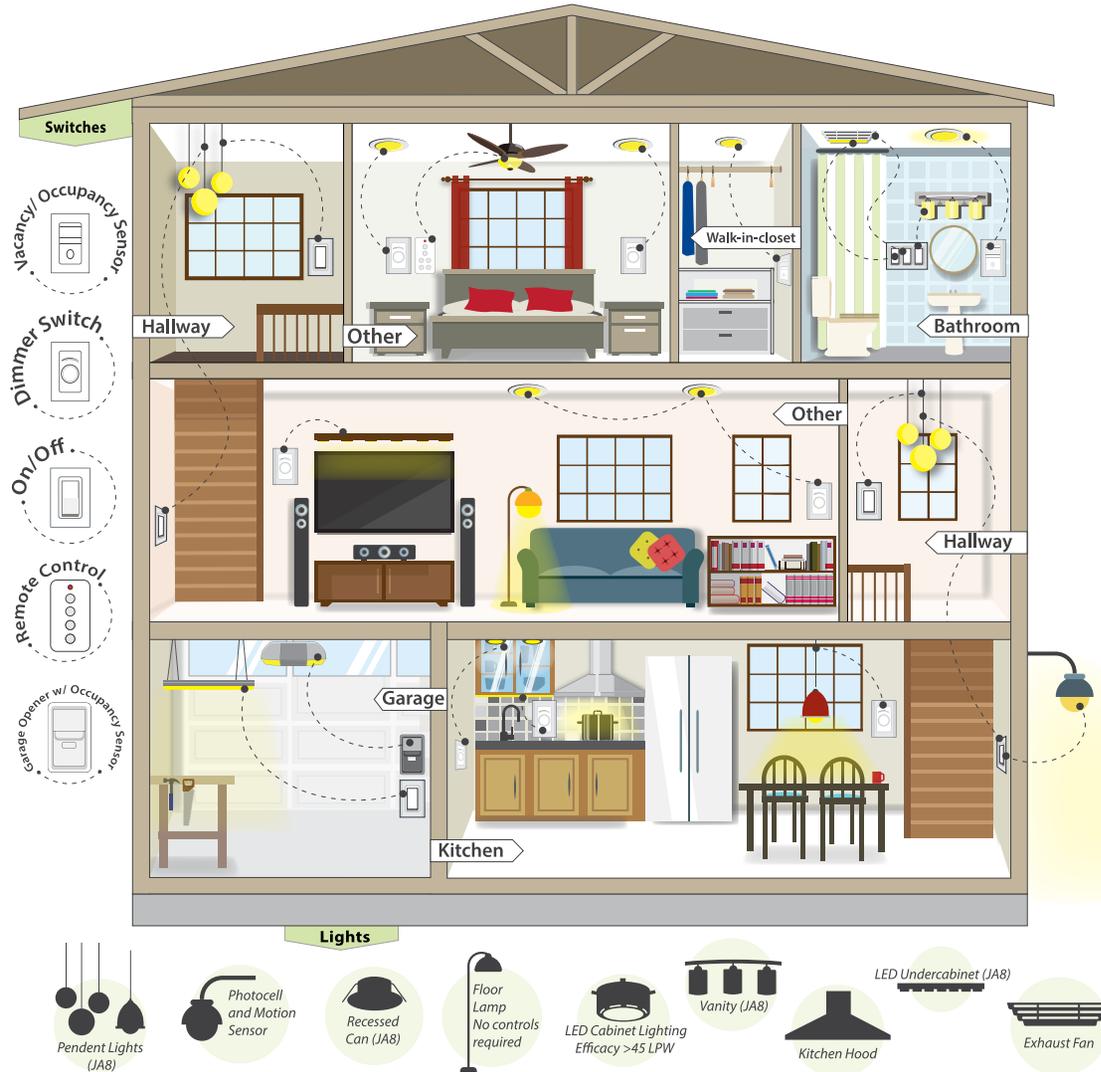
How Does this Fact Sheet Apply to Your Project?

Use this fact sheet to answer these questions about a lighting project:

1. What requirements does your project need to meet to comply with the Energy Code?
2. Who's involved in the compliance process?
3. How should you document your project's compliance?

Table of Contents

- [Importance of Compliance](#) 2
- [Know Your Key Terms](#) 2
- [Nonresidential Lighting and Controls in Multifamily Buildings](#) 2
- [Residential Lighting Requirements](#) 3
 - [Permanently Installed Lighting](#) 3
 - [Installed Luminaires](#) 4
 - [Lighting Controls](#) 5
 - [Additions and Alterations](#) 7
- [Compliance Forms for Residential Indoor and Outdoor Lighting](#) 8
 - [Forms for Single-family Buildings](#) 8
 - [Forms for Multifamily Building Dwelling Units](#) 9
- [For More Information](#) 10



Importance of Compliance

The California Energy Commission estimates that in California lighting accounts for 10% of residential electricity use. The Energy Code for residential lighting is designed to increase the use of efficient technologies in order to decrease this consumption.

Know Your Key Terms

- ✦ **Addition:** New conditioned square footage and volume where new luminaires are installed for the first time
- ✦ **Alteration:** A modification where luminaires are replaced, moved or added on a project with a building permit through an authority having jurisdiction (AHJ)
- ✦ **Lamp:** Lighting industry term for a light source, such as a light bulb or fluorescent tube
- ✦ **Light Source:** The component in a luminaire that actually provides illumination, such as an LED lamp or a fluorescent tube (also called a *lamp* or *light bulb*)
- ✦ **Luminaire:** A complete lighting unit consisting of a lamp and the parts designed to:
 - ◇ Distribute the light (lens, reflector)
 - ◇ Position and protect the lamp (housing)
 - ◇ Connect the lamp to the power supply (ballast, transformer; also commonly referred to as a *light fixture*)
- ✦ **Permanently Installed Lighting:** Hard-wired ceiling luminaires, chandeliers, vanity lamps, wall sconces, under-cabinet luminaires, luminaires in drawers or cabinets, night lights, step and path lights and any other luminaire that is attached to the building, or buildings, on the property
- ✦ **Portable Lighting:** Lighting that is not permanently installed or hard-wired but uses a plug-in connection for electric power (for example, a freestanding floor or table lamp)
 - ◇ *The Energy Code does not apply to portable lighting in dwelling units. Requirements for portable lighting are covered by the Appliance Efficiency Regulations.*
- ✦ **Separable Light Source:** A light source that can be replaced without cutting wires or soldering, such as pin-based or screw-in LED lamps
- ✦ **Vacancy or Occupancy Sensor:** An automatic-off lighting control that includes a manual-off option

Nonresidential Lighting and Controls in Multifamily Buildings

Common Use Area Indoor Lighting

§§160.5(b) and 170.2(e)1-4



Mandatory Requirements

Multifamily common use areas have separate indoor lighting requirements from dwelling units. Common use area requirements are very similar to indoor lighting power allowances and controls for nonresidential buildings.

For more information, see Chapter 11, Section 7 in the *2022 Nonresidential and Multifamily Compliance Manual* (bit.ly/CEC-2022-mf-nr-compliance-manual).



Outdoor Lighting Requirements and Controls

Any building that includes a multifamily or hotel/motel occupancy must comply with separate requirements for any outdoor lighting not controlled from within dwelling units. The basic method to calculate multifamily site outdoor lighting is similar to that used for nonresidential buildings, but it has been changed for the 2022 Energy Code. See the *Nonresidential Lighting Fact Sheet* for more information on multifamily outdoor lighting requirements.

Note that any outdoor lighting controlled from within a multifamily dwelling unit or hotel/motel room must meet the dwelling unit outdoor lighting requirements covered in this fact sheet.

See §§160.5(c) and 170.2(e)6 for a multifamily building and §130.0(b) for hotel/motel.



Residential Lighting Requirements

Permanently Installed Lighting

§§150.0(k) and 160.5(a)



Mandatory Requirements

All permanently installed lighting must meet the requirements in Table 1.



2022 Energy Code Joint Reference Appendix JA8 Certification

Products certified as JA8-2016/JA8-2016-E, JA8-2019/JA8-2019-E or JA8-2022/JA8-2022-E as specified in [Joint Reference Appendix JA8](#) can be used for projects subject to the 2022 Energy Code.

Requirements for Permanently Installed Residential Lighting			
Lighting Types	Must Meet These Residential Lighting Requirements		Unless These Exceptions Apply
	Single-family Buildings and Hotel/Motel Rooms	Multifamily Buildings	
Installed Luminaires	Include light sources classified as high efficacy for compliance per Table 150.0-A	Include light sources classified as high efficacy for compliance per Table 160.5-A	Lighting is integral to exhaust fans, kitchen range hoods, bath vanity mirrors and garage door openers. Lighting is non-removable lighting attached to ceiling fans.
Recessed Downlight Luminaires in Ceilings	Must not contain screw-base sockets Meet the clearance and installation requirements of the California Electrical Code §410.116 Be marked "JA8-2016-E," "JA8-2019-E" or "JA8-2022-E" indicating they are certified as meeting the elevated temperature requirements of Joint Reference Appendix JA8 When installed in insulated ceilings and not marked for use in fire-rated installations have: <ul style="list-style-type: none"> ✦ A rated zero clearance insulation contact and airtight can (ICAT) except when exhaust fan housing has integral lighting ✦ Gasket or caulk sealing between the luminaire's housing and ceiling for all air leak pathways between conditioned and unconditioned spaces When installed in an enclosed or recessed application, mark separable light sources as "JA8-2016-E," "JA8-2019-E" or "JA8-2022-E" indicating they are certified as meeting the elevated temperature requirements of Joint Reference Appendix JA8		
Night Lights, Step Lights and Path Lights	Require Joint Reference Appendix JA8 luminaires		Lighting is < 5 Watts.
Light Sources in Drawers, Cabinets and Linen Closets	Meet Table 150.0-A or Table 160.5-A requirements		Efficacy is ≥ 45 lumens per Watt.
Screw-base Luminaires	Meet the high-efficacy requirements of Joint Reference Appendix JA8 <i>Note: Recessed downlights may not include screw-based sockets.</i>		

Table 1. Requirements for Permanently Installed Residential Lighting



Installed Luminaires

§§150.0(k) and 160.5(a)



Mandatory Requirements

All installed luminaires must meet the requirements in [Table 150.0-A](#) for single-family buildings and hotel/motel guest rooms or [Table 160.5-A](#) for multifamily buildings. Installed luminaires classified in the Energy Code tables as having high luminous efficacy do not require [Joint Reference Appendix JA8](#) certification. All other light sources, including those used in recessed ceiling downlight luminaires, are required to be certified as Joint Reference Appendix JA8. Table 2, below, outlines these requirements in more detail.



Where to Find Certified Products

The National Appliance Efficiency Conservation Act (NAECA) and/or the California Appliance Efficiency Regulations (Title 20) regulate most lighting equipment installed in California homes, including luminaires, ballasts and Joint Reference Appendix JA8 lamps.

Installers should confirm and document that only certified products are installed. Use the Modernized Appliance Efficiency Database System (MAEDbS) tool to find certified products.

(MAEDbS)

bit.ly/MAEDbS

Requirements for Indoor and Outdoor Light Sources

Typical Locations	High Luminous Efficacy Light Sources	Light Sources Required to be Joint Reference Appendix JA8 Certified
Indoor	<ul style="list-style-type: none"> ✦ Pin-based linear fluorescent with electronic ballast ✦ Pin-based compact fluorescent with electronic ballast ✦ Inseparable solid state lighting (SSL) luminaires with colored light sources for decorative lighting purpose ✦ Ceiling fan light kits subject to federal appliance regulations 	Joint Reference Appendix JA8-certified light sources are required for the following: <ul style="list-style-type: none"> ✦ LED luminaires with white, integral light sources that are not decorative ✦ Screw-base LED lamps ✦ Pin-based LED lamps ✦ Any light source not otherwise listed
Outdoor	<ul style="list-style-type: none"> ✦ High-intensity discharge light sources such as pulse-start metal halide and high-pressure sodium light sources ✦ Luminaires with hardwired high frequency generator and induction lamp ✦ LED light sources that are installed outdoors* 	Joint Reference Appendix JA8-2022-E-certified lamps are required for the following: <ul style="list-style-type: none"> ✦ Enclosed or recessed lamps and luminaires ✦ Recessed ceiling downlights

Content adapted from [Table 150.0-A](#) and [Table 160.5-A](#)

* Outdoor high luminous efficacy LED light sources do not include recessed ceiling downlights. For those downlights, refer to the column on Joint Reference Appendix JA8 certification.

Table 2. Requirements for Indoor and Outdoor Light Sources



Lighting Controls

§§110.0, 110.1 and 110.9, 150.0(k)1E,2-5, 160.5(a)1E,2-3



Mandatory Requirements

Energy Code §§150.0(k)1E, 2,3,4 and 5 and 160.5(a)1E, 2 and 3 detail lighting control requirements for installed luminaires. In addition, lighting controls must meet minimum functionality requirements per §§110.0, 110.1, and 110.9. Table 3 summarizes residential lighting control requirements. Portable lighting (lighting that is plugged in) is not subject to these regulations.

Residential Lighting Control Requirements for Installed Luminaires					
Location	Control Requirements				Special Considerations
	Auto-Off Sensor	Dimmer	Pressure Switch	On/Off Switch	
Habitable Spaces: <i>Such as kitchens, bedrooms, living rooms, offices, dining rooms</i>	Vacancy/occupancy auto-off sensors are not required.	Lighting in habitable spaces must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down.			Exhaust fans must be controlled separately from lighting.
Hotel/Motel Rooms	All lighting must shut off within 20 minutes of vacancy, except for one high-efficacy luminaire's on/off switch located within 6 ft of the door. Auto shut-off controls can include captive card key, occupancy sensors or any other automatic controls.	Forward phase-cut dimmers controlling LED light sources must comply with NEMA SSL 7A. Dimmers are not required when: <ul style="list-style-type: none"> ✦ Vacancy/occupancy auto-off sensors are used. ✦ Luminaires connect to a circuit with controlled lighting power < 20 Watts. 	Lighting internal to drawers and cabinetry with opaque fronts or doors require controls that turn lights off when the drawer or door is closed. This lighting does not require dimmers.	On/off switches must be readily accessible wall-mounted manual controls, allowing occupants easy control of lighting in the space. Ceilings fans with integral lighting can be controlled with remote control.	Undercabinet, undershelf and display case lighting must be switched separately from ceiling-installed lighting. Energy management control systems (EMCSs) can be used if they meet Energy Code lighting control requirements and comply with §130.4 or §160.5(a)2 EMCS requirements. Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages.

Table 3. Residential Lighting Control Requirements for Installed Luminaires

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Lighting Controls *(continued)*

Location	Control Requirements				Special Considerations
	Auto-Off Sensor	Dimmer	Pressure Switch	On/Off Switch	
Bathrooms	At least one luminaire in each of these rooms must be controlled with vacancy/occupancy sensor with auto-off function.	Dimmers are not required.			<p>Exhaust fans must be controlled separately from lighting.</p> <p>Undercabinet, undershelf, display case lighting must be switched separately from ceiling-installed lighting.</p> <p>Energy Management Control Systems (EMCS) can be used if they meet Energy Code lighting control requirements and comply with §130.4 or §160.5(a)2 EMCS requirements.</p> <p>Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages.</p>
Laundry or Utility Rooms					
Walk-in Closets					
Garages: <i>Attached or unattached</i>					
Other Non-habitable Spaces: <i>Such as attic spaces, non-walk-in closets, detached storage buildings</i>	Vacancy/occupancy auto-off sensors are not required.	Dimmers are not required when lighting is < 5 Watts.			
Navigation Lighting: <i>Night lights, step lights, path lights</i>					
Blank Electrical Boxes: <i>> 5 ft above floor</i>	Each box must be controlled by a vacancy sensor, occupancy sensor, dimmer, low voltage wiring or a fan speed control.				The number of blank electrical boxes must be no greater than the number of bedrooms.
Outdoors: <i>Lighting attached to a single-family homes, duplexes or townhomes or to any other building on the properties</i> <i>Lighting controlled from within multifamily dwelling units or hotel/motel rooms</i>	<ul style="list-style-type: none"> ✦ Sensor types allowed include: <ul style="list-style-type: none"> ◇ Photocell and motion sensor OR ◇ Photocell and time switch OR ◇ Astronomical time clock OR ◇ EMCS that works like any of the above ✦ Controls that override to ON are not allowed unless the override automatically returns the automatic control to normal operation within 6 hours. ✦ Single-family, internally illuminated address signs must meet nonresidential sign lighting power requirements in §140.8 or use no more than 5 Watts. 		<p>On/off switches are required to allow all other outdoor control functions to work automatically.</p>		<p>Landscape lighting is exempt.</p> <p>Lighting not attached to buildings on single-family, duplex or townhome properties is exempt.</p> <p>Multifamily buildings and property lighting not controlled from within dwelling units has separate requirements per §§160.5(c) and 170.2(e)6.</p> <p>Multifamily common use area illuminated signs must meet §§160.5(c)2C and 170.2(e), and hotel/motel signs must meet §§130.3 and 140.8.</p>

Table 3. Residential Lighting Control Requirements for Installed Luminaires *(continued)*



Additions and Alterations

§§150.0(k), 150.2(b)1K, 160.5(a) and 180.2(b)4A



Prescriptive Requirements

Residential Lighting Requirements for Additions and Alterations	
These Projects Typically Require a Building Permit Required to meet Title 24, Part 6 Lighting Requirements	These Projects Typically Do Not Require a Building Permit NOT Required to meet Title 24, Part 6 Lighting Requirements
<ul style="list-style-type: none">✦ When adding onto a home, the new areas of the home must meet the applicable requirements.✦ When remodeling a home, only the work being done with a permit must meet the applicable requirements.<ul style="list-style-type: none">◇ Existing recessed ceiling luminaires with screw-base sockets do not need to be replaced when Joint Reference Appendix JA8 trim kits or lamps approved for recessed or enclosed light fixtures are used.◇ When altering existing lighting controls, the applicable control requirements will apply. Example: When replacing a manual on/off control, the manual on/off control requirements of the Energy Code (see Table 3).	<ul style="list-style-type: none">✦ Changing light bulbs does not trigger Title 24, Part 6 lighting controls.✦ Spaces not being renovated in a renovation project do not have to meet Title 24, Part 6 lighting requirements.✦ Confirm with your local authority having jurisdiction (AHJ) when a project involves the following:<ul style="list-style-type: none">◇ Replacing lighting fixtures◇ Moving lighting fixtures

Table 4. Residential Lighting Requirements for Additions and Alterations



Compliance Forms for Residential Indoor and Outdoor Lighting

Forms for Single-family Buildings

In addition to permits, lighting projects in single-family homes require the following forms, called certificates, for installation. The forms are available on the Energy Code Ace Get Forms landing page: <https://www.energycodeace.com/content/get-forms>.

There are no Certificate of Compliance (CF1R) form requirements for single-family indoor and outdoor lighting. Mandatory notes should be included in the design documents.

A Certificate of Installation (CF2R) must be provided on-site by the installing contractor or contractors before final inspection. If HERS measures are required for the overall project (typically associated with HVAC and IAQ systems), then the CF2R must be registered with a HERS provider. If there are no HERS measures associated with the project, then the CF2R must be provided but does not need to be registered.

Required Forms for Lighting Projects in Single-family Buildings

HERS Requirements	Project Type	Certificates of Compliance	Certificates of Installation These forms must be completed and signed by the installing contractor and made available for the building department's final inspection.	Certificates of Verification
When Project Overall Requires HERS Registration	New Construction, Additions, Alterations	Not applicable	CF2R-LTG-01-E	Not applicable
When Project Does Not Require HERS Registration	Additions	Not applicable	CF2R-ADD-02-E allowed, or use CF2R-LTG-01-E	
	Alterations	Not applicable	CF2R-ALT-05-E allowed, or use CF2R-LTG-01-E	

Table 5. Required Forms for Lighting Projects in Single-family Buildings



Forms for Multifamily Building Dwelling Units

In addition to permits, residential indoor and outdoor lighting projects require the LMCI and NRCI forms listed in Table 6 for multifamily dwelling units. The LMCI and NRCI Installation Certificates are available via the [Energy Code Ace Virtual Compliance Assistant \(VCA\)](#) or EnergyPro energy compliance software.

There are no Certificate of Compliance (LMCC or NRCC) form requirements for multifamily dwelling unit indoor and outdoor lighting. Mandatory notes should be included in the design documents.

LMCC: Certificate of Compliance for Multifamily Building ≤ 3 Habitable Stories

NRCC: Certificate of Compliance for Multifamily Building > 3 Habitable Stories

Certificates of Installation (LMCI or NRCI) are required to be provided on-site by the installing contractor or contractors before final inspection. HERS registration are not required for the LMCI and NRCI forms.

LMCI: Certificate of Installation for Multifamily Building ≤ 3 Habitable Stories

NRCI: Certificate of Installation for Multifamily Building > 3 Habitable Stories

See the *Nonresidential Lighting Fact Sheet* for Energy Code requirements for all lighting associated with multifamily common use areas and nonresidential occupancies in a mixed-use building.

Required Forms for Indoor and Outdoor Lighting Projects for Multifamily Dwelling Units

Occupancy or Building Type	Certificates of Compliance	Certificates of Installation These forms must be completed and signed by the installing or general contractor and made available for the building inspector before final inspection.	Certificates of Verification	Certificates of Acceptance
Multifamily Buildings ≤ 3 Habitable Stories	Not applicable	LMCI-LTI-E	Not applicable	Not applicable
Multifamily Buildings > 3 Habitable Stories	Not applicable	NRCI-LTI-E	Not applicable	Not applicable

Table 6. Required Forms for Indoor and Outdoor Lighting Projects for Multifamily Dwelling Units



For More Information

CALIFORNIA ENERGY COMMISSION

2022 Building Energy Efficiency Standards

bit.ly/CEC2022Standards

Explore the main CEC web portal for the 2022 Energy Code, including information, documents and historical information.

2022 Building Energy Efficiency Standards Summary

bit.ly/CEC2022Summary

View or download this visual summary of the Energy Code's purpose, current changes and impact.

2022 Single-family Residential Compliance Manual, Chapter 6 Residential Lighting

bit.ly/CEC-2022-SF-residential-compliance-manual

2022 Nonresidential and Multifamily Compliance Manual, Chapter 11, Section 7 Multifamily Indoor and Outdoor Lighting

bit.ly/CEC-2022-mf-nr-compliance-manual

2022 Residential Reference Appendices

bit.ly/Res-Ref-Appendices

2022 Joint Reference Appendix JA8

bit.ly/Joint-Ref-Appendix-JA8

Modernized Appliance Efficiency Database System (MAEDbS)

bit.ly/MAEDbS

Energy Code Hotline

Call: 1-800-772-3300 (Free)

Email: Title24@energy.ca.gov

Online Resource Center

bit.ly/CEC-ORC

Use these online resources developed for building and enforcement communities to learn more about the Energy Code.

ADDITIONAL RESOURCES

University of California, Davis – California Lighting Technology Center

cltc.ucdavis.edu

Where to Find Certified Products

Installers should confirm and document that only certified products are installed. Use the Product Finder and Modernized Appliance Efficiency Database System (MAEDbS) tools to find certified products.

ECA Product Finder

bit.ly/eca-product-finder

(MAEDbS)

bit.ly/MAEDbS

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For More Information *(continued)*



www.energycodeace.com

Stop by this online “one-stop-shop” for no-cost tools, training and resources designed to help you comply with California’s Title 24, Part 6 and Title 20.



Tools

www.energycodeace.com/tools

Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques and energy efficiency regulations in California.

Reference Ace

www.energycodeace.com/content/tools-ace/

Navigate the Title 24, Part 6 Energy Code using an index, keyword search and hyperlinked text.

Forms Ace

www.energycodeace.com/content/tools-ace/tool=forms-ace

Find the forms that apply to your specific project.

Energy Code Product Finder

www.energycodeace.com/content/product-finder

Find Title 24, Part 6-compliant products.

Q&Ace

www.energycodeace.com/QAndAce

Search our online knowledge base or submit your question to Energy Code Ace experts.



Training

www.energycodeace.com/training

On-demand, live in-person and online training alternatives are tailored to a variety of industry professionals and address key measures.

Of Special Interest:

- ◇ 2022 Title 24, Part 6 Essentials – Nonresidential Standards: What’s New
bit.ly/ECA-course-2022-nonres-whats-new
- ◇ 2022 Title 24, Part 6 Essentials – Residential Standards: What’s New
bit.ly/ECA-training-2022-res-whats-new



Resources

www.energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with California’s building and appliance energy efficiency standards.

Of Special Interest:

Fact Sheets for Buildings

bit.ly/ECA-building-fact-sheets

- ◇ Multifamily Buildings: What’s New in 2022?
- ◇ Single-family Buildings: What’s New in 2022?
- ◇ Multifamily and Nonresidential Acceptance Testing

Fact Sheets for Appliances

bit.ly/ECA-appliance-fact-sheets

- ◇ MAEDbS 101
- ◇ T20 Basics – Retailers, Distributors & Installers

Check EnergyCodeAce.com for our latest 2022 tools, training and resources!

Create an account on the Energy Code Ace site and select an industry role for your profile in order to receive messages about all our offerings!



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