

## CALIFORNIA ENERGY COMMISSION

## BLUEPRINT

## EFFICIENCY DIVISION

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## California Lighting Technology Center Lighting Guides

The California Lighting Technology Center (CLTC) has published guides to help navigate the lighting requirements in the 2013 Building Energy Efficiency Standards (Energy Standards). The guides focus on specific lighting applications and pro-

vide useful information on lighting concepts and principles, technology overview, best practices, compliance requirements, and examples of real world lighting applications. The goal of these guides is to assist builders and lighting industry professionals in meeting and exceeding the 2013 Energy Standards.

The CLTC has published the following guides:

- [High Efficacy Residential Lighting Guide](#)
- [Office Lighting Guide](#)
- [Outdoor Lighting Guide](#)
- [Residential Lighting Guide](#)
- [Retail Lighting Guide](#)

The lighting guides are available on the CLTC's webpage at: <http://cltc.ucdavis.edu/publication-type/guides>.

The guides are sponsored by Pacific Gas and Electric Company (PG&E) and were developed in collaboration with the California Energy Commission (Energy Commission). These guides are supplements to [Chapter 6](#) of the 2013 Residential Compliance Manual and Chapters [5](#), [6](#) and [7](#) of the 2013

Nonresidential Compliance Manual. Additionally, these guides complement lighting courses developed through the CLTC and are sponsored by PG&E's Energy Education program.

For more information, please visit: <http://cltc.ucdavis.edu/>.

## New Mechanical Acceptance Test Technician Certification Provider

On March 11, 2015, the Energy Commission approved the National Energy Management Institute Committee (NEMIC) as a Nonresidential Mechanical Acceptance Test Technician Certification Provider (ATTCP).

This means that NEMIC has the authority to train, certify, and oversee Acceptance Test Technicians (ATTs) and their employers. NEMIC will train and certify ATTs to perform all 18 mechanical acceptance tests required in the 2013 Energy Standards.

For more information on the ATTCP program, please visit the Energy Commission's website at:

<http://energy.ca.gov/title24/atcp/>.

## New HERS Provider for Residential Alterations

Energy Analysis & Comfort Solutions, Inc. (EACS) was approved as a Home Energy Rating System (HERS) Provider, under the 2013 Energy Standards at the February 25, 2015, Energy Commission Business Meeting.

EACS is authorized to train and certify HERS Raters for field verification and diagnostic testing for alterations to residential buildings.

EACS may be reached at:

Telephone: (844) 411-3227

E-mail: [info@eacsinc.com](mailto:info@eacsinc.com)

Website: [www.eacsinc.com](http://www.eacsinc.com)

For a complete list of approved HERS Providers, please visit: <http://www.energy.ca.gov/HERS/providers.html>.

## Q&A

### Luminaire Certification Requirements

#### Do LED luminaires need to be certified to the Energy Commission?

For nonresidential lighting applications, nonresidential LED luminaires (as described in [Section 110.9\(e\)](#)) are not required to be certified to the Energy Commission.

For residential lighting applications (including areas listed in [Section 130.0\(b\)](#)), residential LED luminaires or LED light engines must be certified to the Energy Commission per [Section 110.9\(e\)](#) to qualify as high efficacy lighting. [Section 150.0\(k\)](#) does have requirements for the installation of high efficacy luminaires for residential construction. Please see [TABLE 150.0-A](#) for classification of high efficacy and low efficacy light sources.

A list of certified high efficacy LEDs can be viewed in the Title 20 [Appliance Efficiency Database](#) by selecting the "Lighting Products" category, and selecting "High Efficacy LEDs for Title 24" as the type.

#### Are luminaires with integrated controls required to be certified to the Energy Commission?

For nonresidential lighting applications, luminaires are not required to be certified to the Energy Commission. However, there are certification requirements for lighting controls.

Self-contained lighting controls must be certified to the Energy Commission per [Section 110.9\(a\)3](#) of the Energy Standards. This includes self-contained lighting controls integrated into the luminaire or fixture. The luminaire or fixture itself does not need to be certified. A listing of certified self-contained lighting controls can be viewed in the [Appliance Efficiency Database](#).

A self-contained lighting control is defined in [Section 100.1](#) as:

*"A unitary lighting control module that requires no additional components to be a fully functional lighting control."*

Lighting control systems do not need to be listed in the Appliance Efficiency Database.

Lighting control systems are defined in [Section 100.1](#) as requiring:

*"Two or more components to be installed in the building to provide all of the functionality required to make up a fully functional and compliant lighting control."*

For example, a lighting control system may consist of a group of luminaires with a factory-integrated control that must be programmed in the field to be a fully functional and compliant lighting control.

For more information on certification requirements for lighting controls, see [Fact Sheet - Certification and Verification of Lighting Controls](#).

## Exempt Processes

**If a process does not meet the definition of a covered process, as defined in [Section 100.1](#), do the mandatory and prescriptive requirements for covered processes need to be met?**

No, if a process does not meet the definition of a covered process, it is considered to be an exempt process. Exempt processes do not need to meet the mandatory requirements of [Section 120.6](#) or the prescriptive requirements of [Section 140.9](#).

**If a process is listed in the definition of a covered process, but the process itself does not meet its own definition, is the process considered an exempt process?**

Yes, the process is considered an exempt process. An exempt process is not required to comply with the mandatory requirements of [Section 120.6](#) or the prescriptive requirements of [Section 140.9](#).

For example, consider a computer room which has a design equipment power density of 15 watts per square foot of conditioned floor area. A computer room is listed in the definition of a covered process. However, the definition of a computer room in [Section 100.1](#) is:

*“A room whose primary function is to house electronic equipment and that has design equipment power density exceeding 20 watts/ft<sup>2</sup> (215 watts/m<sup>2</sup>) of conditioned floor area.”*

Because the computer room in this example does not meet the definition of a computer room, it is an exempt process.

**Do exempt processes that have space conditioning systems, which include an air-side economizer, need to meet the multispeed fan control requirements in [Section 140.4\(m\)3](#)?**

Not necessarily. Multispeed fan control is required for airside economizers that are designed to meet the requirements of [Section 140.4\(e\)1](#). If the economizer does not meet the design requirements of [Section 140.4\(e\)1](#), because it meets one of the exceptions, then it does not need to meet the multispeed requirements of [Section 140.4\(m\)3](#). Possible exceptions include: the exempt process has special humidity requirements; or special outside air filtration and treatment for the reduction and treatment of unusual outdoor contaminants makes compliance infeasible (see [Section 140.4\(e\)1](#)).

**I am installing a fan powered high-efficiency particulate air (HEPA) filtration module in a clean room. The HEPA filtration module is not part of the space conditioning system. Must an electronically commutated (EC) motor be used to comply with [Section 140.4\(c\)4](#)?**

No, because the fan powered HEPA filtration module is not part of the fan system used for space conditioning, compliance

with [Section 140.4\(c\)4](#) is not required.

## Acceptance Testing

**If a building is less than 10,000 square feet, do I need to have acceptance testing conducted?**

Yes, all nonresidential, high-rise residential, and hotel/motel projects, where applicable lighting controls or mechanical systems are installed, must undergo acceptance testing. This applies to new construction, additions and alterations (see Sections [120.5](#), [130.4](#) and [141.0](#)).

## Air Flow and Fan Efficacy for New Duct Systems

**I have installed all new ducts for my air conditioning system. The system has passed the minimum airflow requirement of 350 cubic feet per minute (CFM) per ton of nominal cooling capacity through the return grilles. However, it exceeds the air handling unit fan efficacy maximum of 0.58 watts per CFM listed in [Section 150.0\(m\)13B](#). Why is this occurring?**

Undersized ducts could be the cause. Undersized duct system installations are common, causing issues such as reduced air flow, increased static pressure, increased watt draw of the space conditioning system, a decrease in tons of available cooling capacity, and an overall decrease in air handler fan efficiency. In order to overcome

these issues, oversized space conditioning systems are sometimes installed to force air through the duct system and pass air flow testing. The overall power consumption increases due to the oversized space conditioning system, resulting in poor fan efficacy.

Fan efficacy can be improved by implementing the following measures:

1. Pull flexible ducts tight;
2. Reduce bends in ducts;
3. Make only large radius bends;
4. Do not install hard 90s;
5. Fix compressed ducts;
6. Install supply grills that are not stamped;
7. Add a second return;
8. Increase return duct size and filter grill area;
9. Do not install oversized space conditioning systems.

Also, note that an alternative to meeting the airflow and fan efficacy requirements is available for standard ducted systems, by sizing return ducts and grilles according to [TABLE 150.0-C](#) or [TABLE 150.0-D](#).

### Power Distribution

**If I change a feeder to an electrical panel, do I need to upgrade the panel to disaggregate the electrical circuit?**

Yes, [Section 130.5\(b\)](#) requires the electrical circuits to be disaggregated according to [TABLE 130.5-B](#). Please note that dis-

aggregation of electrical circuits may not be required for certain load types with electrical services rated 50 kVA or less. Disaggregation can be accomplished by using any of the methods specified in [Section 130.5\(b\)](#).

Additionally, the feeder must also meet the voltage drop requirements of [Section 130.5\(c\)1](#).

**A subpanel is being relocated during a tenant improvement (TI) remodel. Is disaggregation of the electrical circuit required or does this project qualify for an exemption?**

Since the subpanel is being relocated the project does not qualify for an exemption. Therefore, the electrical circuit must be disaggregated as required by [Section 130.5\(b\)](#).

Exceptions may apply. EXCEPTION 2 to [Section 130.5\(b\)](#) states,

*“Alterations where all of the following conditions exist are not required to comply with this section:*

- A. *The following existing equipment remains in place:*
  - i. *Service distribution switchboards or panelboards; and*
  - ii. *Feeders; and*
  - iii. *Motor control centers or panelboards.*

*B. Existing equipment included in Item A (above) remains unaltered except for:*

- i. *Changes to load circuit connections; or*
- ii. *Changes to the quantity of outgoing overcurrent protection devices; or*
- iii. *Changes to the ampacity of outgoing overcurrent protection devices.”*

**New cubicles, which include new receptacles, are being installed in an existing open office area. The existing branch circuits are not being changed. Are the controlled receptacle requirements triggered?**

Yes, the newly added receptacles of the new cubicles must meet the controlled receptacle requirements of [Section 130.5\(d\)4](#).

**New cubicles, which have new receptacles, are being installed in an existing open office area. The existing branch circuits have to be moved. Do all receptacles within the open office area need to be upgraded to controlled receptacles?**

No, only newly added, altered, or replaced receptacles of the new cubicles must meet the requirements of [Section 130.5\(d\)4](#).

Existing cubicles are going to be reconfigured in an existing open office area. The branch circuits have to be moved. However, there will be no other changes to the existing circuiting. Are the requirements of [Section 130.5](#) triggered?

Based on the description, there are no newly added, altered, or replaced receptacles and the branch circuits have not been altered, other than being moved. Therefore, the requirements of [Section 130.5](#) are not triggered.

Are the controlled receptacle requirements applicable to additions or alterations?

The requirements of [Section 130.5](#) are applicable for additions and alterations as specified in Sections [141.0\(a\)1](#) and [141.0\(b\)2](#).

Newly added or altered receptacles have to meet the applicable requirements of [Section 130.5\(d\)](#).

In spaces that require controlled receptacles, do I have to install controlled and uncontrolled receptacles in a 1 to 1 ratio?

No, each controlled receptacle must be installed within 6 feet of an uncontrolled receptacle. Two or more uncontrolled receptacles can be within 6 feet of the same controlled receptacle (see [Section 130.5\(d\)](#)).

The California Energy Commission welcomes your feedback on *Blueprint*. Please contact Andrea Bailey at [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov).

**CALIFORNIA ENERGY COMMISSION**

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