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Sign Lighting

Overview

This chapter discusses the requirements for sign lighting (indoor signs and outdoor signs) in the Energy Code. There are requirements for controls, maximum allowable power, and minimum efficacy. These requirements conserve energy, reduce peak electric demand, and are both technically feasible and cost-effective. The Energy Code does not allow trade-offs between sign lighting power allowances and other end uses.

The 2025 Energy Code includes some updates to the lighting sources for signs – the changes reflect the ubiquitous and readily available of energy-efficient LED light sources as well as the banning of sales and distribution of linear fluorescent lamps and compact fluorescent lamps starting in 2024.

Scope and Application

Please refer to Chapter 7.1.1 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Summary of Requirements

Please refer to Chapter 7.1.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Mandatory Measures

Please refer to Chapter 7.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Lighting Control Functionality

Please refer to Chapter 7.2.1 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Determining Luminaire Power

Please refer to Chapter 7.2.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Mandatory Sign Lighting Controls

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Please refer to Chapter 7.3.1 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Outdoor Sign Lighting Controls

Please refer to Chapter 7.3.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Demand-Responsive Lighting Controls for Electronic Message Centers

Please refer to Chapter 7.3.3 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Sign Lighting Power Requirements

Please refer to Chapter 7.4 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Scope of Sign Lighting Power Requirements

Please refer to Chapter 7.4.1 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Applications Excluded From Sign Lighting Power Requirements

Please refer to Chapter 7.4.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Sign Lighting Power Compliance Options

Please refer to Chapter 7.4.3 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Maximum Allowed Lighting Power

Reference: Section 140.8(a)

The maximum allowed lighting power compliance approach limits allowed sign lighting power based on the illuminated sign area. When using this approach, there are rules in the Energy Code for classifying the lighting technology used and determining luminaire power. Additional information on determining luminaire power is including in Determining Luminaire Power of this chapter.

This compliance approach may be used for any light source type except unfiltered LED and unfiltered neon lighting, which must comply with the alternate lighting source compliance method described in Alternate Lighting Sources.

The maximum allowed lighting power for internally and externally illuminated signs is calculated as follows:

Internally Illuminated Signs

Internally illuminated signs (see Figure 7-1: A picture of Illuminated Signs) are defined in the Energy Code as signs that are illuminated by a light source that is contained inside a sign where the message area is luminous, including cabinet signs and channel letter signs. The maximum allowed lighting power shall not exceed the product of the illuminated sign area and 12 watts per square foot of illuminated sign area. For double-faced signs, only the area of a single face shall be used to determine the allowed lighting power.

Figure 7-1: A Picture of Illuminated Signs

Source: California Energy Commission

Figure 7-2: An Internally Illuminated Sign

Source: California Energy Commission

Externally Illuminated Signs

Externally illuminated signs (see Figure 7-3: An Externally Illuminated Sign with a Ground-Mounted Luminaire) are defined in the Energy Code as any sign or billboard that is lit by a light source that is external to the sign directed toward and shining on the face of the sign.

The maximum allowed lighting power shall not exceed the product of the illuminated sign area and 2.3 watts per square foot of illuminated sign area. Only areas of an externally lighted sign

that are illuminated without obstruction or interference, by one or more luminaires, shall be used.

Figure 7-3: An Externally Illuminated Sign With a Ground-Mounted Luminaire

Source: California Energy Commission

Alternate Lighting Sources

Reference: Section 140.8(b)

The alternate lighting sources compliance approach specifies lighting technologies that may be used to meet the sign lighting power requirements. A sign is in compliance if it is equipped only with one or more of the following light sources:

- Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to one of the following:
    - A minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA.
    - A minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater.

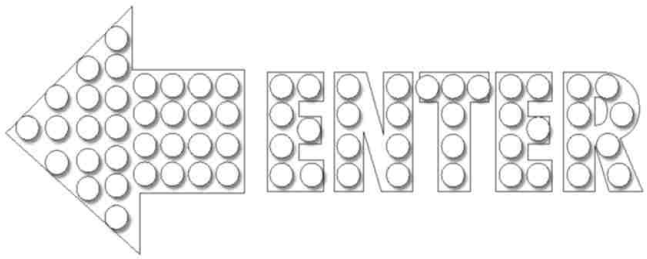
      The ratio of the output wattage to the input wattage is at 100 percent tubing load.
- LEDs with a power supply efficiency of 80 percent or greater.
    - Single-voltage external power supplies that are designed to convert 120 volt AC input into lower voltage DC or AC output and which have a nameplate output power less than or equal to 250 watts and must comply with the applicable requirements for external power supplies in the Appliance Efficiency Regulations.

Hybrid Signs

A sign may consist of components that are regulated and components that are not regulated. For example, a single sign structure may have a regulated internally illuminated cabinet, regulated externally illuminated letters attached to a brick pedestal, and unregulated unfiltered incandescent "chaser" lamps forming an illuminated arrow. Figure 7-4: Unfiltered Incandescent Sign shows an arrow, which is not part of an EMC using unfiltered incandescent lamps.

If the lamps are not covered by a lens, then only the control regulations (§130.3) apply to the sign. This type of unfiltered incandescent sign is not regulated by §140.8.

Figure 7-4: Unfiltered Incandescent Sign



Source: California Statewide CASE Team

Example 7-1: Neon and Cold Cathode Lighting

Question:

Can I use neon or cold cathode lighting in my sign and comply with the Energy Code under Option 2 (compliant alternate lighting sources)?

Answer:

Yes, neon and cold cathode lighting are allowed under the alternate light source compliance option, provided that the transformers or power supplies have an efficiency of 75 percent or greater for output currents less than 50 mA and 68 percent or greater for output currents 50 mA or greater.

Example7-2: Indoor Sign Lighting in a Theater Lobby

Question:

Do signs inside a theater lobby or other indoor environments need to comply with the sign requirements?

Answer:

Yes, all illuminated signs must comply with either the maximum allowed lighting power or compliant alternate lighting sources compliance option.

Example 7-3: Alternate Lighting Sources – Incandescent Lamps

Question:

My sign is equipped with both hardwired compact fluorescent lamps and incandescent lamps. Can my sign comply under the alternate lighting sources approach?

Answer:

No. Because your sign is not exclusively equipped with energy efficient technologies allowed under the alternate lighting sources approach (incandescent sources are not allowed and fluorescent lamps are not available from sales in 2024), it must comply under the maximum-allowed lighting power compliance option. Your other option is to replace the incandescent sources and fluorescent lamps with an option allowed under the alternate lighting sources, such as compliant LED or cold cathode lamps.

Example 7-4: Alternate Lighting Sources – Multiple Light Source Types

Question:

My sign has an internally illuminated panel sign equipped with electronic ballasts and unfiltered 30 mA neon tubes above and below the panel sign having power supplies with 76 percent efficiency. Does this sign comply with the compliant alternate lighting sources option?

Figure 7-5: Unfiltered Neon Tube Sign

Source: California Statewide CASE Team

Answer:

Yes, as long as the internally illuminated panel portion is illuminated with a compliant technology. This sign is essentially made up of three different signs (the panel sign and the two neon tubes); the entire sign complies as long as each part complies.

Example 7-5: Sign Lighting and Outdoor Lighting Zones

Question:

Do outdoor lighting zone requirements apply to sign lighting?

Answer:

No. Lighting for signs must meet the sign lighting requirements and does not need to meet the outdoor lighting requirements.

Additions and Alterations

Please refer to Chapter 7.5 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Sign Alterations

Reference: Section 141.0(b)2M

Existing indoor and outdoor internally and externally illuminated signs that are altered as specified by §141.0(b)2M are required to meet the sign lighting power requirements in §140.8. Altered components of existing indoor and outdoor internally and externally illuminated signs must also meet the requirements in §130.0.

The sign lighting power requirements (either maximum-allowed power or alternate lighting sources) are triggered by alterations to existing internally or externally illuminated signs when any of the following occurs as result of the alteration, as specified in §141.0(b)2M:

- The connected lighting power is increased.
- More than 50 percent of the ballasts are replaced and rewired.
- The sign is relocated to a different location on the same site or on a different site.

These requirements are not triggered when only the lamps are replaced, the sign face is replaced, or the ballasts are replaced without rewiring.

Sign ballast rewiring that triggers the alterations requirements generally involves rewiring from parallel to series or vice versa, or when a ballast(s) is relocated within the same sign requiring relocating the wires. This does not include routine in-place ballast replacements.

Example 7-6: Replacing More Than 50 Percent of Ballasts

Question:

We are replacing 60 percent of the ballasts in a sign. Must we replace the remaining ballasts in the sign to comply with the Energy Code?

Answer:

If more than 50 percent of the ballasts are being replaced, and the replacement involves rewiring the ballasts, then the requirements of §140.8 apply to the whole sign. If more than 50 percent of the ballasts are being replaced during regular maintenance, and the ballasts are not being rewired, then compliance with §140.8 is not required.

Example 7-7: Altering Existing Signs

Question:

I have a strip mall full of signs, and I will be altering some of them. Must I immediately bring all signs into compliance?

Figure 7-6: Example Strip Mall

Source: California Energy Commission

Answer:

No. Only those signs in which at least 50 percent of the ballasts are replaced and rewired or those signs that are moved to a new location (on the same property or a different property) must comply with the sign lighting power requirements. All newly installed signs must comply with sign lighting control requirements and sign lighting power requirements.

Energy Compliance Documentation

Overview

Please refer to Chapter 7.6.1 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Inspection

Please refer to Chapter 7.6.2 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Explanation of Compliance Document Numbering System

Please refer to Chapter 7.6.3 of the *2022 Nonresidential and Multifamily Compliance Manual*.

Certificates of Compliance and Installation

The certificate of compliance documents demonstrate that the overall design of the regulated building or system complies with the Energy Code.

The plans examiner is responsible for verifying that these documents are submitted with the building plans and are complete when required. See Chapter 2 for more information about the certificate of compliance.

The NRCC-LTS-E is the nonresidential sign lighting certificate of compliance.

The certificates of installation primarily declare that what was installed matches the plans and certificates of compliance. The certificate of installation is signed by a person with an approved license.

Even if the design has errors and has specified incorrect features and devices, the installer is responsible to meet all the applicable requirements that he or she installs.

A copy of the completed, signed, and dated certificate of installation must be posted at the building site for review by the local enforcement agency in conjunction with requests for final inspection. See Chapter 2 for more information about certificates of installation.

The NRCI-LTS-E is the nonresidential sign lighting certificate of installation.

Lighting Control Systems Certificate of Installation

Please refer to Chapter 7.6.5 of the *2022 Nonresidential and Multifamily Compliance Manual*.