

6.2.3 Permanently Installed Luminaires

The Standards require that all permanently installed luminaires be high efficacy as defined by the Standards, with some exceptions described later in this chapter. Permanently installed luminaires include, but are not limited to those luminaires installed in, on, or hanging from the ceilings or walls (including ceiling fan lights); in or on built-in cabinets (including kitchen, nook, wet bar, and other built-in cabinets); and those mounted to the outside of the buildings. Permanently installed luminaires do not include lighting that is installed in appliances by the manufacturers including refrigerators, stoves, microwave ovens, or exhaust hoods.

6.3 Kitchens

§150(k)2.

The Standards define a residential kitchen to be “a room or area used for food storage and preparation and washing dishes including associated counter tops and cabinets, refrigerator, stove, oven, and floor areas.” The definition goes on to say, “Adjacent areas are considered kitchen if the lighting for the adjacent areas is on the same switch as the lighting for the kitchen”.

The intent of the kitchen lighting Standard is to insure the builder provides the occupant with energy efficient lighting. The permanently installed lighting should provide sufficient light levels for basic kitchen tasks without the need for augmenting with portable (plug-in) lighting.

A design recommendation may be to utilize the Illuminating Engineering Society of North America (IESNA) guidelines that at least 30 footcandles of light be provided for seeing tasks in kitchens. Seeing tasks include, but are not limited to, the basic kitchen tasks as preparing meals and washing dishes. These tasks typically occur on accessible kitchen countertops, the tops of ranges and in sinks, where food preparation, recipe reading, cooking, cleaning and related meal preparation activities take place, as well as at the front of kitchen cabinets so that the contents of the cabinet are discernable. Although the design should achieve 30 footcandles on most counter-height, horizontal work surfaces, there may be a few work surfaces where the lighting levels fall below this value and the fronts of kitchen cabinets may also be below this value. Even in these locations, the lighting level provided should not fall below the IESNA-recommended lower value for non-critical seeing tasks of 20 footcandles. Parts of counters that are not work surfaces, such as a corner underneath a cabinet, may have a lighting level below 20 footcandles and still meet the requirements of the standard, because meal preparation is unlikely to occur in those areas.

The Standards require that at least half the lighting watts in a kitchen must be consumed by high efficacy luminaires (remember that low-voltage halogen MR lamps do not count as high efficacy). Because high efficacy luminaires typically consume less power than other luminaires, about three-fourths of the luminaires in the kitchen are likely to be high efficacy. See Form WS-5R, Residential Kitchen Lighting Worksheet, Appendix A, which is completed to determine if kitchen lighting complies with the Standards.

High-efficacy fixtures and non-high efficacy fixtures are required to be switched separately. Our recommendation is to also separately switch different layers of the kitchen lighting. Each layer that can serve a unique function should have the ability to operate independent.

The following are some examples of layers that code allows to be switched together but are recommended to be switched separately:

- Recessed Downlights
- Linear fluorescent luminaires mounted on the ceiling.
- Under-cabinet lighting.



*Under-cabinet lighting using 14W and 28W T5 linear fluorescent lamps
Source: www.gelighting.com*

Figure 6-2 – Kitchen Work Surface Lighting

- In uplights (mounted on walls or on top of cabinets). Uplights are effective at making rooms less gloomy, so if an uplight is provided people may choose not to switch on the other lights in the room.

Non-high efficacy luminaires must be switched on a separate circuit from the high efficacy luminaires. These could include low-voltage halogen MR lamps or reflector lamps used to provide decorative spotlighting.

Lighting in areas adjacent to the kitchen, such as dining and nook areas and even family rooms, is considered to be kitchen lighting if it is not separately switched from the kitchen lighting. The switches may be mounted on the same faceplate, but as long as the lights can be switched independently, these areas do not count as being in the kitchen.



Recessed cans with 18W CFLs light specific task areas



Wall-mounted uplighters using 32W CFLs increase the sense of space

Figure 6-3 – General Kitchen Lighting

For incandescent luminaires including, but not limited to those with medium screw base sockets that can accept lamps of many different types and wattages, the wattage of the luminaire used in calculations and shown on the building plans is to be its maximum rated relamping wattage as marked on the luminaire, on a permanent factory-installed label. For luminaires with modular components that allow conversion between screw-based and pin-based sockets without changing the luminaire housing or wiring, it shall be assumed that an incandescent lamp of the maximum relamping wattage available for that system will be used. For compact fluorescent luminaires with permanently installed ballasts that are capable of operating a range of lamp wattages, the highest

operating input wattage of the rated lamp/ballast combination must be used for determining the luminaire wattage. For low voltage track lighting, use the rated wattage of the transformer listed on a permanent factory-installed label. For line voltage track lighting, use the volt-ampere rating of the branch circuit feeding the track, or the volt-ampere of a current limiter integral to the track if there is one, or the higher of the rated wattage, as listed on a permanent factory-installed label, of all the luminaires installed, or 45W per ft of track.

All other miscellaneous lighting equipment not addressed in §130 (c) 1 through 4, shall be the maximum rated wattage (for incandescent lamps) of the lighting equipment, or operating input wattage (for miscellaneous lighting systems with ballasts or transformers), as listed on a permanent factory-installed label, or published in manufacturer's catalogs, based on independent testing lab reports as specified by UL 1574 or UL 1598.

The wattage of the lamp as actually installed or as marked on the building plans shall not be used to determine if compliance has been met at site inspection. Compliance shall be determined by verifying that the wattage marked on the luminaires is consistent with the wattage used to determine compliance.

Example 6-1

Question

I am using an incandescent luminaire over the sink that is capable of housing a 150-watt lamp. I plan to install a 26-watt compact fluorescent lamp in the socket. Does this qualify as a high efficacy luminaire and what wattage should I use in determining if half the lighting power in the kitchen is high efficacy?

Answer

The luminaire does not count as high efficacy because it is capable of being lamped with an incandescent lamp. Use the maximum rated power (150 W) for determining the percent of high efficacy lighting.

Example 6-2

Question

If I use track lighting in a kitchen, how do I calculate the power?

Answer

See §130(c). For line voltage track, use the maximum relamping wattage of all of the installed luminaires as listed on permanent factory-installed labels, or 45 watts per linear foot of track, whichever is larger. An alternate method is to calculate the power based on the volt-ampere rating of the branch circuit feeding the track, or the volt-ampere of a current limiter integral to the track. For low-voltage tracks, use the rated watts of the transformer as listed on a permanent factory-installed label.

Example 6-3

Question

I am doing minor renovations to my kitchen that has six recessed incandescent cans and I am adding a new luminaire over the sink. Does this luminaire have to be a high efficacy luminaire?

Answer

Yes, all new luminaires must be high efficacy until at least 50% of the total lighting wattage comes from high efficacy luminaires (§152 (b) 1 and §152 (b) 2).

Example 6-4

Question

I am completely remodeling my kitchen and putting in an entirely new lighting system. How do the Standards apply to this case?

Answer

At least half the lighting watts must be high efficacy luminaires. This is treated like new construction.

Example 6-5

Question

Where does the kitchen lighting stop and the other lighting begin in the case of a large family room with the kitchen on just one side of an approximately 24-ft by 24-ft room. Is the kitchen nook part of the kitchen? Lighting over the eating counter? Lighting in an adjacent pantry?

Answer

Lighting over food preparation areas is kitchen lighting, including areas used for cooking, food storage and preparation and washing dishes, including associated countertops and cabinets, refrigerator, stove, oven, and floor areas. Any other lighting on the same switch is also kitchen lighting, whether or not the luminaires are in the kitchen area. Lighting for areas not specifically included in the definition of a kitchen, like the nook or the family room, is not kitchen lighting, as long as it is switched separately.

Example 6-6

Question

I am installing an extraction hood over my stove, it has lamps within it. Do these lamps have to be high efficacy?

Answer

This lighting is part of an appliance, and therefore does not have to meet the Standards for permanently installed lighting. This lighting is ignored in determining if half the kitchen lighting is high efficacy.

Example 6-7

Question

Am I still required to control the general lighting by a switch on a readily accessible lighting control panel at an entrance to the Kitchen as required in the 2001 and earlier versions of the Standards?

Answer

No. In the 2005 Standards there are no constraints on where the control for high efficacy Kitchen lighting is located, only that the high efficacy lighting must be switched separately from the low efficacy lighting.