

High-efficacy lighting in new homes - Code Notes

[2009 IECC and 2009 IRC]

Lighting consumes more than 10% of electric energy used in homes, presenting a substantial opportunity for lowering residential energy consumption. The International Code Council (ICC) recently passed a code change that will appear in the 2009 International Energy Conservation Code (IECC) and the International Residential Code (IRC) requiring that half of the permanent lighting in a new home have high-efficacy lamps.

Requirements

Section 404.1 of the 2009 IECC and Section N1104.1 of the 2009 IRC state that a minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. ICC defines high efficacy as: 60 lumens/W for lamps over 40W; 50 lumens/W for lamps over 15W to 40W; 40 lumens/W for lamps 15W or less.

Lamp	Efficiency
#15W	40 lumens/W
>15W-40W	50 lumens/W
>40W	60 lumens/W

High-Efficacy Lamps

These efficacy minimums are above the level of current incandescent products. However, many compact fluorescent lamps, all T-8 or smaller diameter linear fluorescent lamps, and most metal halide lamps meet these requirements. A "lamp" is simply the light bulb or tube itself; it is not the fixture. So a chandelier is one fixture but may have many lamps.

The count is based on the number of lamps and includes both pin-based fixtures (fluorescent tubes and pin-based compacts) and standard screw-base fixtures. The provision applies to indoor spaces and outdoor facades of all residential buildings, including accessory structures and garages. The code permits up to 50% of the lamps to be of a standard efficacy, providing flexibility to allow lighting for certain applications that cannot be met with high-efficacy lamps.

Benefits

Compact fluorescent lamps (CFLs) have become more available and have dropped in price. A 60-watt replacement CFL can be purchased for about \$1.50 per lamp. CFLs use about 80% less energy than standard incandescent lighting and last 6 to 10 times longer. At \$1.50 per lamp with electricity at 9 cents per kwh, the payback time is less than two years, assuming that each light is on a half hour each day.

CFLs offer versatile lighting solutions

CFLs are available in a variety of shapes and sizes so they can be used in most areas of the home where standard incandescent lamps would be used. Their longer life makes them ideal for high ceilings and other hard-to-reach spots. Reflector CFLs are now available for recessed downlighting; the best models have passed Elevated Temperature Life Testing, lasting over 6,000 hours without failure (see www.pnl.gov/rlamps).

Energy-efficient chandeliers

While incandescent lamps have traditionally been used in chandeliers because of their ability to dim and their small size possibilities, dimmable high-efficacy CFLs designed for candelabra-sized sockets and other specialty applications are also readily available.

For more information on lighting, see the [ENERGY STAR®](#) web page.



Plan Review

Verify that 50% of all lamps will be high-efficacy according to the count of lamps as shown on the plans. Confirm each lamp type's efficacy by requiring manufacturer's or independent test data for each lamp type indicating its efficacy rating. If the manufacturer or product packaging has only separate ratings for lumen output and wattage, simply divide the lumen rating by the wattage to get lumens per watt.

Field Inspection

Inspect representative CFL lamps, linear fluorescents, and other lamps to ensure that at least 50% of all lamps are high-efficacy by comparing the installed lamp make/model number to the ones on the approved plans. Non-specified lamps should have efficacy rating information supplied at inspection.

Code Citations*

IECC 2009, Section 404.1 Lighting equipment

A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

IECC 2009, Section 202 General Definitions

High-Efficacy Lamps sets the criteria.

IRC 2009, Section N1104.1 Lighting Equipment

A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

IRC 2009, Section R202 General Definitions

High-Efficacy Lamps sets the criteria.

2009 ICC Reference and link

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International Energy Conservation Code.
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