



## **Kitchen Lighting Guidelines (Or More than You Ever Wanted to Know about Fluorescent Lighting)**

Updated 5/19/2006

Designers are now using fluorescent lamps interchangeably with the more familiar incandescent. Here in California, Title 24, California's Energy Code, requires that the General Lighting in your kitchen or bath be fluorescent. I prefer to creatively conform to Title 24 lighting guidelines rather than replacing fluorescent lamps with incandescent as soon as the building inspector has cleared the corner on his way back downtown. The results save energy every day for the life of the home, contribute to the comfort and well being of the inhabitants and create drama and beauty in place of the mundane and ordinary.

Lighting presents an opportunity to have something different and exciting in your kitchen. While you may have been focused on the cabinetry and appliances, countertops and flooring; the lighting may very well be what sets your kitchen apart from those created by your friends or those who hire designers whose training and experience does not include lighting design. Lighting is a fast-changing industry. Here are some general guidelines for choosing fixtures and lamps.

### **Title 24**

In order to decrease energy consumption, California has adopted a recently revised (October 2005) energy code (Title 24) that significantly impacts lighting in new and remodeled homes.

### **All new and remodeled homes must incorporate energy efficient lighting and controls.**

Depending on the room, these include:

- Dimmers
- Occupancy Sensors
  - Must be certified Title 24 compliant
  - Must be manual-on/automatic-off (can also be turned off manually)
  - Must turn off automatically in 30 minutes
  - Cannot be locked in a permanent "on" state
  - High efficacy lights - fluorescent, compact fluorescent (CFL) or high-intensity discharge (HID) lamps
  - Fluorescent, CFL, and HID lights must not have a medium screw base socket
  - Lamps rated 13 watts or greater must have an electronic ballast

### **KITCHEN**

- Fluorescent lighting - at least 50% of installed wattage must be from fluorescent, CFL or HID lights (13 watts or greater require an electronic ballast)
- Incandescent lighting - up to 50% of installed wattage may be incandescent lighting if switched separately

For further detailed information on Title 24's lighting requirements for residential applications see the UC Davis [Title 24 –Residential Lighting Design Guide.](#)

**NOTE:** Any time I “mix” fluorescent and incandescent lighting in a kitchen or bathroom, I must submit forms to your building department showing the wattage of each fixture. So that the inspector can see that you are not exceeding the 50% limit on incandescent wattage. This means that all fixtures need to be chosen, and specified, BEFORE submission of your plans to the building department. I like to use 100% fluorescent, which negates this requirement and allows you to choose these products when your new kitchen is being remodeled.

### **Direct Fluorescent Tube-shape Lamps and Compact Fluorescents (CFLs)**

Choose lamps (lightbulbs) for a fixture or recessed can, in 2700K (Kelvin), the warm golden color closest to incandescent. For those who prefer a color closer to sunlight, choose 3000-3500K (illogically, the higher number equals "cooler" light color). You will need to go to a lighting store or supply house to get these lamps. Call first and ask to see a display of the various "colors" of fluorescent lamps. If they say they don't have such a display - keep looking. Once you find such a display, look at your hands, your cabinet color, your countertop material, flooring, etc. under the lamps to see which color you prefer.

Your under cabinet lighting will come in fixtures that require small diameter fluorescent lamps. The same rules apply here as for any other "direct" application. The colors of food items on your countertops will be much more natural and pleasing to the eye if you invest in 2700-3500K lamps. Minimum always is warm white.

### **Indirect Fluorescents**

I like to place fluorescent lamps on top of upper cabinets in a kitchen or around the perimeter of a skylight shaft-concealed from direct view. I use double rows of warm-white to 2700-3500 Kelvin lamps and switch them separately, to give a high and low intensity to the light. For higher budget projects, I specify electronic ballast for no-flicker starting. The light bounces off the ceiling or skylight shaft and creates a dramatic and efficient fill light with no apparent source except the warm glow on the reflecting surfaces.

Those lamps in fixtures shielded at the tops of cabinetry or behind mouldings may be 2700-3500K, or "Warm White". Indirect light bounces off the ceiling; therefore the ceiling must be white, or very light in color. The bounced light picks up its color from the ceiling color, thus the lamp color is not as critical, EXCEPT where the visible reflection from the actual lights hits the ceiling. If you want to see "warm" there you need 2700K.

The paint on the ceiling or other reflecting surface should be flat, not glossy, as the light will emphasize irregularities on the surface. The surfaces must be carefully finished to minimize irregularities.

### **Halogens**

I prefer to avoid specifying halogen lights except for special circumstances. The lamps create excessive heat and need special handling, besides being energy hogs. The oils in your skin cause the lamps to fail prematurely; therefore you must not touch them. The heat created by a burning halogen lamp is a concern to me when used in a recessed fixture, both in terms of increased fire danger to your home and comfort for you and your family, especially in areas where air conditioning is needed to keep your home comfortable. Be sure to discuss these issues with your lighting supplier and select fixtures that offer the most safety.

Halogens are best used as an accent or tiny pendant, not as general lighting. The light created with halogen is intense and sparkly, so if you are lighting a sculpture or trying to accent an architectural feature, halogen is for you.

### **Xenon**

Some fixtures are available now with cooler burning Xenon lamps, which, I think, are preferable to halogen. The lamps can also be handled without problems (see halogens).

### **LEDs**

LED (light emitting diode) fixtures are the latest in lighting. Low energy users; these tiny lights, assembled into arrays, are popping up in all sorts of commercial applications and will soon be seen everywhere in residential as well. I recently designed a wonderful bath with color-changing LED array fixtures in the tub and behind glass block that change colors in synchronization. Such lighting/color design is called "Chromatherapy". What a wonderful concept!

### **Recessed Fixtures for Task and Accent Lighting**

Choose fixtures and reflectors that match the ceiling color as nearly as possible. If you can not match them, they should be painted to match. Our philosophy is that the light should be seen, not the source. It is not necessary to choose tiny fixtures, as you will need more of them to light the surface and the task. The largest fixtures are for high ceilings or commercial use. Choose 6-8" openings for normal ceiling height applications. We used to specify incandescent lamps for recessed task lighting. But nowadays, special recessed fixtures accept compact fluorescent lamps for energy efficiency in light of our recent energy crisis. Be sure to choose minimum 26-watt fixtures to get electronic ballast.

### **Recessed Fixtures for General Lighting**

Although I always prefer to create general lighting with indirect fluorescent, sometimes it is necessary to specify fluorescent recessed lighting for your general lighting. Choose 26-watt+ fixtures with electronic ballasts for flicker-free starting. If they are specified for general lighting in your kitchen or bath, follow my specifications and choose compact fluorescents in a color you like (see above) and keep them in place permanently. Many contractors, trying to be accommodating, will offer to swap them out for incandescents after your final inspection. This tactic is costly in terms of your long-term energy use and should be avoided.

### **Under Cabinet Fixtures**

Under cabinet lights may be specified to provide task lighting for your countertops, these lights are most often fluorescent although incandescent, halogen, xenon and LED under cabinet fixtures are available at higher cost. As noted above, I feel that fluorescent fixtures and lamps provide the best combination of longevity, energy savings, and cool operation for under cabinet mounting and use.

Optionally choose fixtures with electronic ballasts for flicker-free starting. Choose the shortest height fixtures for visibility considerations ESPECIALLY in kitchens where table height seating is featured, since most people will be looking up at the bottoms of wall cabinets when seated. Choose fixtures that accept lamps in your choice of the kelvin ranges discussed above. Have your contractor mount undercabinet fixtures toward the fronts of the cabinets for best lighting of your countertops. Leave enough room behind the fixtures to mount a paper towel holder.

When using polished granite countertops, consider placing recessed can lighting in the ceiling in front of your upper cabinets. That way you will not be faced with the reflection of your undercabinet lights in the granite countertops.

### **Fixtures for Indirect Lighting Applications**

I usually specify fluorescent lighting for applications such as general lighting mounted on the tops of cabinetry or other indirect applications. The fixtures are usually specified in two rows on separate switches to provide low and high levels of general lighting. Optionally, choose fixtures with electronic ballasts for flicker-free starting.

Since these fixtures will cast direct light on the reflecting surface, the rows should be mounted so that their ends alternate to avoid dark spots on the reflecting surface (when both rows are on). Or choose more expensive fixtures that can be mounted end-to-end with no lighting voids for the nicest result (Peerless makes one).

Visibility of the lamps in indirect applications is to be avoided, therefore choose fixtures and lamps that are short enough to not be visible from the farthest vantage point in the room. It is especially important for your contractor to prepare the tops of cabinets to accept the lighting fixtures by cutting away the concealed sides of manufactured cabinets which protrude above the cabinet tops where cabinets are joined together. When this is properly done the fixtures will sit 3/4" to 1" lower on the recessed top of a face frame type cabinet. Crown or other trim mouldings will conceal the rest of the fixture from all but Michael Jordan types.

Fluorescent fixtures are available in heights ranging from the inexpensive "industrial" size, which amounts to 4 or more inches in height with the lamp, to mini-types less than 2" high, to "undercabinet" types, which are 1" or less in height. There are also fixtures that mount "sideways", reducing overall height; fixtures that incorporate two lamps, side-by-side; and even fixtures side-by-side with staggered ends. The cost of the fixture and lamp and its light output is directly related to its size and specialization factor, therefore choose the highest, largest fixture that will not be visible to family members.

Please feel free to call with questions not answered here regarding lighting in your remodeled spaces. Also please keep a record of your choices in lamps for your fixtures so that you can duplicate your well-thought-out efforts when you need to replace lamps.

Here are some lighting labs in our area where you can see various recessed fixtures, trims and lamps installed as well as the above-mentioned fluorescent lighting boxes. [PG&E's Energy Center](#), 851 Howard Street in San Francisco (415) 973-7268, Bay Lighting - Margit Yasukawa - 1140 Folsom Street, San Francisco (415) 552-4110, [Galaxy Lighting](#) 1081 S DeAnza Blvd, San Jose, CA 95129 (408) 252-4060. Take along your samples. Call for an appointment.

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