

A Look at Bathroom Lighting

Choosing lamps and fixtures that will give you the most natural-looking and energy-efficient lighting

BY ANDREW WORMER



A combination is best. This windowless bathroom has a skylight to admit daylight. The incandescent tube lights (Alinea by Aamsco) flank the lavatory, creating even illumination at the counter. Design by architect Philip Mathews.

A GLOSSARY OF BATHROOM-LIGHTING GUIDELINES AND TERMINOLOGY



The upstairs bathroom of my condo has terrible lighting. No matter how sunny a morning it is, I shower in gloom. And when I stand in front of the sink to brush my teeth and comb my hair, I'm always surprised by all the new wrinkles and dark shadows that have magically appeared on my face overnight.

Although the view in my mirror is sobering enough, even more sobering is the fact that the lighting in this bathroom isn't unusual. Countless bathrooms across the country have similar lighting: a combo ventilation fan/light fixture located approximately in the middle of the 5-ft. by 8-ft. ceiling and another recessed fixture over the sink. This

kind of lighting is guaranteed to make you look bad, whether you're the designer of the bathroom, the builder or the person using it. Fortunately, coming up with a better lighting plan isn't difficult. To choose the right bathroom-lighting fixtures, first you have to focus on the object you want to illuminate.

Begin with the vanity

In my bathroom, the task lighting (glossary above) is supplied by a single recessed fixture. It contains a 50w R20 incandescent reflector lamp—also known as a light bulb (chart p. 59). This is a bad idea. The narrowly focused light from this fixture does a good job of lighting the sink, but it's supposed to

light my face. Instead, it shines directly on top of my head, casting weird shadows under my eyes, cheekbones and chin. Lots of people like recessed fixtures, which are also called recessed cans. They're versatile and unobtrusive, and can provide both narrowly focused or broadly diffuse light. But one thing that they don't do well is provide good vanity lighting. If you insist on using recessed-can fixtures for this purpose, be sure to use more than one, and offset them to both sides of the sink. Multiple recessed fixtures will help to soften shadows and supply a more diffuse light.

The goal of any type of vanity lighting is not to light the mirror, the sink or the top of

GREAT IDEA



Glass blocks can be light fixtures, too.

A pair of linear fluorescent lamps mounted behind this mirror bounce their light off a wall of glass block. The back of the mirror, which is held 4 in. off the block, is painted white to reflect the light better. Design by Steven and Cathi House.

the mirror. This option produces mirror lighting better than that of most ceiling-mounted fixtures but still not as good as fixtures mounted to the sides of the mirror.

Besides Hollywood lights, other types of fixtures can be mounted at or near eye level on both sides of the mirror as well. Wall-mounted sconces, brackets and diffusers are available in a wide range of designs and in every style imaginable. The best ones all have this trait in common: You can't look directly at the lamps because they are shielded in some way by translucent lenses or by the position of the fixture. If you choose Hollywood lights, which have exposed lamps, you should use frosted lamps rather than clear ones to reduce glare.

Linear lamps—tubes of various lengths and diameters—are available in both incandescent and fluorescent varieties. They are an increasingly popular alternative to Hollywood lights, especially now that fluorescent lamps have advanced beyond their flickering and buzzing early days (sidebar p. 58). Some designers use fluorescent tube lights in creative ways that make one-of-a-kind fixtures, such as the vanity lighting by architects Steven and Cathi House (photo left).

Despite the improvements to fluorescent lighting, however, some skeptics are still convinced that they need incandescent lighting in the bathroom. Want an incandescent

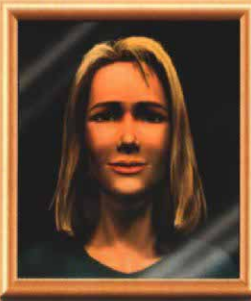
lamp in a tube? Alkco Lighting's Lincandescent fixture is a good choice for vanity lighting because of its sleek design and diffuse, warm light.

Don't forget the tub and shower

Building codes wisely discourage the use of lighting fixtures that can be easily reached while standing in a shower or sitting in a tub. This restriction means that track lighting and cord-connected hanging fixtures can't be located within 8 ft. vertically and 3 ft. horizontally of the rim of a bathtub [NEC 410-4(d)]. In addition, fixtures used in wet locations (like a shower) need to be specifically certified

for this use. Over the years, I've seen some interesting interpretations of these rules, but practically speaking, this rule means that vaporproof ceiling-mounted or recessed-can fixtures are needed here.

Light from both sides is best



A face lighted by an overhead light will have sharply accentuated shadows. Flanking the mirror with a row of vertical lights, however, creates even illumination that eliminates shadows.

the head, but to light the face. Therefore, the best vanity task lighting is supplied by wall-mounted fixtures at eye level on both sides of the mirror. When these types of fixtures have multiple lamps that are arranged vertically, they produce desirable, virtually shadowless lighting that is called vertical cross illumination.

Many different types of fixtures produce this type of lighting. For example, most folks are familiar with so-called "Hollywood lights," or metal strips with multiple incandescent globe lamps (drawing left). My downstairs bathroom has a single Hollywood light mounted above the mirror, and the light quality is much better than in the upstairs bath. This simple theatrical design has mutated into many different consumer-oriented incarnations, but the original idea was to surround a mirror with light that would shine evenly onto the face. Of course, most residential bathrooms forget about the lights on the side and simply mount a single light strip above

Internet lighting sources

More people are shopping for lighting fixtures on-line. Here's a sampling of Web addresses to get you started.

aamsco.com
alkco.com
americanlightingassoc.com
brasslight.com
cooperlighting.com
efi.org
ge.com
hescolighting.com
junolighting.com
lampsplus.com
lightingparadise.com
lighting.philips.com
lucidlighting.com
rejuvenation.com
seagulllighting.com

Don't make the mistake (like the builder of my condominium did) of assuming that a combo fan/light mounted in the middle of an average-size bathroom will supply enough light to a tub/shower area. Glass shower doors don't block much light, but many kinds of opaque shower curtains do, leaving the occupant in the dark when the curtains are drawn. A vapor-rated fixture centrally located over the shower or tub is the best solution. Keep in mind, however, that a bright overhead light may not create the right ambience for a long soak in a tub. That's why it isn't a bad idea to put this light on a dimmer control. Russ Leslie, director of the Lighting Research Center at Rensselaer Polytechnic Institute, suggests that a shower light can also double as night-lighting because it probably doesn't bathe the bath in bright light. For that reason, the switch should be located near the entryway.

If you do opt for the combination light/ventilation fan, don't make the mistake of skimping on quality. Ultraquiet low-noise (less than 1.5 sone) fans that are barely audible are worth the extra money. Loud fans are so irritating that they often go unused.

Have adequate general lighting

As bathrooms have become larger, there has been a parallel increase in demand for general and decorative lighting. Architect Joe Rey-Barreau particularly likes wall sconces as a more attractive alternative to typical overhead lighting. He also noted that he is seeing more suspended decorative fixtures in bathrooms now, such as chandeliers and suspended uplights and downlights.

In some situations, you don't want the fixture to be a decorative element. All you really want is the light it provides. In this case, recessed lights really shine (photo right). Recessed-can fixtures are available in different sizes, shapes and styles, and they accept incandescent, halogen and compact fluorescent lamps. Their placement in the ceiling depends on their purpose. Downlights should be above task areas, but offset slightly to minimize glare and shadows. Downlights mounted near a wall create a scalloped effect and accentuate the wall's texture: a good idea when you have a finely Crafted brick wall, a bad idea when the light shines on a poorly taped gypsum wall.

There are too many manufacturers of recessed-can fixtures to list here, but better ones share these traits: They have interchangeable reflector and trim options, and they are available in IC-rated (insulated ceiling) mounting frames for fixtures to be in second-story or attic locations. An IC-recessed



Recessed cans provide general lighting without influencing the style. General lighting is supplied by both the skylight and the recessed-can fixtures overhead, while wall-mounted fixtures supply important task lighting for the vanity. Concealed in the toe-kick area, this accent lighting makes the vanity appear to float while doing double duty as an elegant night-light.



Rope lights make good accents. Tiny incandescent lights bound into a flexible PVC tube can be snaked behind valances.

can has a shield to keep it from overheating when it's under a blanket of insulation.

A problem with recessed-can fixtures is that they can make your ceiling look and act like Swiss cheese. The appearance factor is manageable: just don't use more recessed lights than you really need. The larger issue is air infiltration. Moist bathroom air pouring through the holes in a bathroom ceiling can condense in an attic, creating potential for mold, mildew or structural damage.

One solution that I've found to this problem is Juno Lighting's Air-Loc IC fixture. This recessed can has an unperforated housing to stop air leaks, and it comes with peel-and-stick gaskets to prevent leaks around the rim of the fixture. I also like Juno's comprehensive range of baffles, diffusers, reflectors and louvers that fit in their mounting frames.

Decorative lighting

As you can see, general lighting can also double as decorative lighting. One concept of Rey-Barreau's that I think is really helpful in planning bathroom lighting is to think in terms of "layers of light." One layer is the lighting in the vanity area, which in some small powder rooms may be enough. If a bathroom is larger or if it has separate compartments for the toilet, tub or sink, it will need another layer to light these areas. Some bathrooms might even need a third layer of light, consisting of wall sconces, recessed-can fixtures or other ceiling-mounted fixtures to supplement the light of the other two layers. The fourth layer—decorative lighting—is primarily for effect.

Lighting layers can overlap (drawing p. 55). General lighting can be supplied by an architectural valance, soffit or cove, for example, particularly in high-ceilinged rooms.

Linear fluorescent lamps are ideal for this application because of their cool temperature, long life (they don't need to be changed often), energy efficiency (the lights can be left on) and the diffuse light they produce.

Some designers like to use decorative lighting in unusual places—in the toekick area of a cabinet, for instance, or inside a cabinet with glass doors. Low-voltage (12v or 24v) halogen lighting is well suited for this purpose. Small halogen lamps produce a lot of light for their size and can be placed in a number of different kinds of fixtures depending on the application. Remember that all low-voltage lighting needs a transformer.

Another option is decorative rope lighting (photo left). This snakey stuff is a supple ½-in. dia. PVC tube with tiny bulbs at 1-in. intervals. At \$3.50 to \$12 per ft., it isn't expensive, and it can be placed in unusual locations for unexpected accents. Rope lighting is available in different colors. It can be cut at designated intervals (typically 18 in.), and it can be bent and twisted to replicate the look of neon lights. Both low-voltage and line-voltage rope lighting is available at specialty lighting shops or via the Internet.

Where should I shop for fixtures?

In researching this article, I pressed industry professionals for advice on choosing specific fixtures, and then finding suppliers. The rule is that there aren't any rules. For some designers, the key issues (besides the actual quality of the fixture itself) were service and availability. Other designers pointed out that all the new lamps and technology have vastly expanded the range of fixtures now available. New innovations—for example, compact-fluorescent lamps that are now the same size as incandescents, tiny T-4 halogen lamps, narrow-diameter T-5 linear fluorescent lamps—really drive the latest fixture designs. And now we have the Internet to fuel our searches. For specific products, check out the Web sites in the source box on p. 56.

Although designers mentioned such things as UL-listing, plastic vs. metal holders and glass vs. plastic lenses, they all seemed to agree that the real story was not so much the fixture (although style and quality are important) but the lamp that the fixture holds and the quality of light that it produces. Decide what it is you want to light, choose the lamp that does the best job, and then figure out which fixture will hold that lamp. □

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The end of incandescence?

We're all familiar with the warm glow of incandescent (tungsten) lamps and their low initial cost. But these advantages still come with a price. The major one is energy inefficiency. Less than 10% of an incandescent lamp's wattage produces light. The rest turns into heat. The second strike against incandescent lamps is their relatively short life span—typically from 750 hours to 2,000 hours.

Halogen lamps last longer than ordinary incandescent light bulbs because the halogen gas in the lamps extends the life of the tungsten filament. These lamps burn at a higher temperature and are sometimes referred to as "quartz lighting" because of their stronger, more heat-resistant quartz bulbs. Incidentally, halogen lamps can be dimmed like regular tungsten lamps, but this cools them down and shortens their life span unless the lamps are periodically turned back to full power. Halogen lamps typically last as long as 3,500 hours.

Halogen lamps burn at a slightly higher color temperature than regular incandescent light—about 3000°K—so they produce a whiter light. Many designers use halogen lamps for contemporary interiors that display intense primary colors. Standard tungsten lamps are preferred in more traditional interiors whose colors feature subdued earth tones.

A FLUORESCENT FUTURE?

Most of us have grown up hating the flickering, unpleasant light of fluorescent lamps. But that was then. This is now, and fluorescents are the name of the game. They last 10 to 20 times as long as incandescent lamps, operate at three to four times the efficiency,

and produce light with comparable color temperatures and color-rendering ability. What changed?

Improved phosphors are the main reason why the new fluorescents are better than the old. Manufacturers can now make lamps that produce specific color temperatures by using different combinations of elements in their phosphor coatings.

Improved ballasts also make the new fluorescent lamps better. Ballasts provide the starting voltage and regulate the current to a fluorescent lamp. The old ballasts were infamous for their mechanical buzzing, and they were responsible for the unpleasant flickering quality of the light. Not any more. New electronic ballasts use solid-state circuitry that virtually eliminates lamp flicker and hum.

So with everything fluorescents have going for them, why are they still struggling for acceptance? For one thing, their initial costs are considerably more expensive. You can spend up to \$20 for a self-ballasted 20w lamp to replace a comparable 75w bulb costing 75¢. But it doesn't take long before these lamps start paying for themselves in energy savings.

Until recently, you couldn't put a fluorescent light on a dimmer switch. But some new ballasts and fluorescent lamps, such as Philips Earth Lamp, can be used with any controls that work with regular incandescent lighting.

Finally, fluorescents don't turn on instantly. Even at normal room temperature, it takes a few moments for them to reach their full light output. And in cold locations (not your bathroom, I hope), the wait for full light output can be much longer.

—A. W.

THE COLOR, AND COST, OF LIGHT

A comparison of different types of light sources

| Lamp description | Watts* | Lumens (brightness) | Life** | Kelvin | Annual cost*** |
|--------------------------------------|--------|---------------------|--------|--------|----------------|
| A Incandescent globe | 25 | 210 | 1,500 | 2550 | \$ 3.75 |
| B Incandescent "A" | 60 | 870 | 1,000 | 2800 | \$ 9.00 |
| C Halogen minican | 75 | 1,200 | 2,000 | 3000 | \$11.25 |
| D Fluorescent compact twin | 13 | 825 | 10,000 | 2700 | \$ 2.10 |
| E Fluorescent compact quad | 26 | 1,800 | 10,000 | 2700 | \$ 4.80 |
| F Fluorescent tube (1 in. by 48 in.) | 32 | 3,050 | 20,000 | 3000 | \$ 5.40 |

* Includes ballast wattage for fluorescents

** Average number of hours a light source is expected to burn

*** Calculated at 10¢ per kwh based on average residential use of 1,500 hours per year (includes ballast wattage)

Chart courtesy of American Lighting Association

Natural daylight is considered the benchmark against which artificial light is compared. But even natural light varies in appearance, ranging from the warm reddish light of the setting sun to the clear blue light of a northern sky.

Color temperature is an objective measurement (in degrees Kelvin) of a light source's appearance. The higher the color temperature, the cooler the light source appears. Late-afternoon sun has a color temperature of about 4000°K, while a brilliant blue sky has a color temperature of about 8500°K. Incandescent lamps produce light that has a color temperature of about 2800°K, a temperature considered warm and inviting. Normal fluorescent lamps have a cooler light in the 4000°K to 5000°K

range, which is perceived as being harsh and unfriendly, or bright and alert depending on your point of view.

Skin tones are best rendered by lamps with a color temperature in the warm range, or 2800°K to 3500°K, and with a high (80+) color rendering index (CRI), a measurement of a light source's ability to render color accurately.

—A. W.

