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The shape of lights to come? Not everyone's buying it

By Elizabeth Weise, USA TODAY Feb. 29,2008

Their spiral design is a symbol of "going green," the movement to make homes and living more energy-efficient. And sales of compact fluorescent lights, or CFLs, are booming: They made up 20% of the U.S. light bulb market in 2007, the Environmental Protection Agency says, up from 11% a year earlier.

Sales probably will continue rising as traditional incandescent bulbs begin disappearing from stores because of Congress' mandate that light bulbs be at least 25% more efficient by 2012. Wal-Mart, Home Depot, IKEA and other major retailers now sell a range of CFLs, which typically use nearly 75% less energy than regular bulbs.

But now that more people are using CFLs, the bulbs' shortcomings are giving some consumers pause. Consumers are raising concerns about the quality of light from such bulbs and say they often don't work well with dimmer switches, in certain light fixtures or in hot or cold conditions.

And although fluorescent bulbs are less expensive to use in the long run, some consumers are turned off by the cost: $3 to $10, compared with about 50 cents for regular bulbs. Meanwhile, retailers such as IKEA are setting up recycling programs in response to concerns about how to dispose of CFLs, which contain mercury and could pose a health hazard if they break and are not cleaned up properly.

Such drawbacks help explain why, even though one in five bulbs sold in the USA is now a compact fluorescent, a lower percentage of American homes — estimates run as low as 11% — have at least one of the bulbs.

Connie Samla, a lighting specialist at the Municipal Utility District in Sacramento, cites the 11% figure as a symbol of many consumers' reluctance to accept fluorescent bulbs. She says such sentiments are rooted in the problems of the early versions of such bulbs during the 1990s, when they produced a sickly green or blue light.

"They're used to fluorescent lamps flickering and having a horrible color, and they don't want to have them in their home," says Samla. Her agency now holds classes to teach residents what to expect from CFL bulbs. Some common complaints about compact fluorescents:

•They don't start out at full brightness. The bulbs can take up to a minute to reach full glow. That took a while for Kay Drey of St. Louis to get used to. "It was a little alarming at first," she says, "but then they brightened up."

•They're temperature-sensitive. If it gets much below 30 degrees, "they won't start up very quickly," Samla says. Because the phosphor in CFL bulbs that emits light takes awhile to warm up, the bulbs "like to be a little warmer. But if you get them too hot, they don't like that. They love 77 degrees: office temperature."

CFL bulbs also burn out quicker if they're in a hot environment such as inside a light fixture, says Noah Horowitz, a scientist with the Natural Resources Defense Council: "If you put it in an enclosed fixture, maybe it will last 3,000 or 5,000 hours, not 10,000." He notes, however, that even a reduced life for a fluorescent bulb tops the life of a typical incandescent bulb, usually 750 to 1,000 hours.

•One size does not fit all. The more light a CFL puts out, the bigger it must be. The CFL equivalent of a 60-watt bulb is tiny. The 120-watt equivalent is bigger and won't fit in many lamps and fixtures.

That's a problem for Drey, 74, whose house is about as old as she is. "I have old lamps, so (CFL bulbs) don't fit everywhere. But where they do fit, we have them in."

•Many CFL bulbs don't work well with dimmer switches and three-way light fixtures. A few will work, but they're hard to find. "If you put a regular CFL on a dimmer, in some cases it will hum and snap; it won't live as long, and it won't dim," Horowitz says.

When used with a dimmer switch, CFL bulbs typically will dim to about 20% of their full intensity and then cut out. They also must be turned on at a high setting and then dimmed, says Philip Scarbro, consumer division director at Energy Federation Incorporated, a group that promotes conservation.

When used in a three-way light fixture, many CFL bulbs will pop, hiss and buzz. There are a few three-way CFL bulbs, but they're tough to find and so big they do not fit in many lamps. Such bulbs often come with adaptors to lengthen the lamp's harp so the bulb will fit.

•They're still not widely available. Most supermarkets carry a limited supply of CFL bulbs. For more variety, buyers must go to a hardware store or a larger retailer such as Home Depot or Wal-Mart. Some have begun ordering fluorescent bulbs online, from websites such as **bulborama.com** and eft.org.

For many consumers, the reluctance to use CFLs comes down to the dingy light they can emit and questions about their safety.CFLs give off a different color of light than incandescent bulbs. A measure of that is the color rendering index

(CRI), which indicates how "true" colors will look. A CRI of 100 is sunlight or an incandescent bulb. Most CFLs are rated in the 80s, Scarbro says.

That's close enough to an incandescent light that many people won't notice, says Bill Burke, an architect who teaches builders how to use fluorescent lighting at Pacific Gas and Electric's Pacific Energy Center in San Francisco.

But it's not close enough for amateur photographer Eric Chan of Belmont, Mass.

"I don't like the quality" of CFL bulbs, Chan says. "As a photographer who produces my own color prints, I am unusually picky about how these prints ought to look. They look fine under daylight, incandescent and halogen bulbs but appear mediocre in comparison when lit by CFL bulbs."

CFLs are significantly brighter than the fluorescent lights used in schools and offices during the 1960s and 1970s. Those lights typically have a CRI rating of about 25.

Today, companies such as GE and Philips are starting to market what they call "natural" or "full spectrum" CFLs. They're closer to incandescent but not quite as bright.

CFL bulbs are best in table or floor lamps with a shade, Samla says. "They have such good colors now that you can't tell."

Unlike incandescent bulbs, however, compact fluorescents can pose a health hazard. CFL bulbs usually contain 3 to 5 milligrams of mercury, although new types have as little as 1 to 2 milligrams. Mercury is a toxin that can be particularly dangerous to children and fetuses.

There's no danger in using CFL bulbs, but if they break, users should don plastic gloves and take steps to avoid contamination.

If a CFL breaks, stay calm, Scarbro says. It's not quite a hazardous-material situation: The amount of mercury in a CFL bulb is tiny compared with older thermometers used to measure temperatures, which had about 400 milligrams.

After a CFL bulb breaks, simply "open the windows and doors, sweep up the glass and throw it away," Scarbro says. "You shouldn't vacuum because that will take whatever level of mercury airborne. But it's not enough to close off the room and call EPA."

He says old CFL bulbs should be recycled or disposed of like other hazardous waste such as paint. Some governments have begun CFL bulb recycling programs, as have IKEA and a few other retailers. One company, Veoliaes Environmental Services, accepts old bulbs by mail for recycling.

But there is no national recycling system, and frustration over the availability of recycling programs is raising questions about how long it will take such

programs to catch on. Drey says she called a hotline run by the maker of her bulbs to learn how to recycle them. "It was not an easy thing to do," she says.

Scarbro and other CFL advocates say that even if such bulbs are thrown into the trash, each CFL bulb represents a net reduction of mercury in the environment compared with each incandescent bulb. That's because the amount of mercury generated by a power plant to light a CFL bulb is dramatically less than that generated to light an incandescent bulb, Scarbro says.

Federal officials agree that the energy saved by CFL bulbs makes them worthwhile.

Lighting typically makes up about 20% of a household's electric bill. Because CFLs are close to 75% more efficient than regular light bulbs, the EPA estimates that if every home in America replaced just one light bulb with a CFL bulb rated highly by the agency, the USA would save enough energy to light more than 3 million homes for a year and more than $600 million in annual energy costs. It also would prevent greenhouse gases equivalent to the emissions of more than 800,000 cars, the EPA says.

Trying to save energy -

That was Veson Terry's motivation. He just moved from an apartment in San Francisco where the utilities were paid to a condo in Daly City, Calif., where he pays the bills. "I decided I want to see whether this stuff really works." So he has swapped out every incandescent bulb in his unit for a CFL.

He even has them in his dining room's chandelier, though it means he can't use the dimmer. Even so, he's pleased with the results. The top swirl of the bulbs sticks out of the lamps, "but I don't care, just as long as I can save energy."

CFL bulbs were invented in 1976 by Ed Hammer, a General Electric engineer. They were a response to the energy crisis of 1973-1974. But his spiral tube design was too expensive to make and too fragile to ship, so GE shelved it.

A more incandescent-like warm white CFL was developed by Phillips in 1982. It wasn't until 1995 that a cost-effective, durable spiral design was introduced. But there were many problems with the original CFLs, making some early adopters swear off them forever.

Besides their unflattering light, they didn't last as long as they do now — 1,000 hours then, up to 15,000 hours today. They also were more expensive: $10 to $20, compared with as little as $3 today.

Horowitz acknowledges the shortcomings of CFLs but says the congressional mandate to boost efficiency will push manufacturers to keep coming up with better bulbs.

"This is an easy way to address global warming," Drey says. "We all have to participate. That's all there is to it."