

What is an LED TV, really?

When a product has become commoditized and its price is regularly dropping and its profit margins are getting ever-thinner, how can a company boost its sales and raise its prices? One way is by changing the product's name.

That's what has been done with LCD TVs using LEDs to illuminate the screen. In its print advertising and on its Web sites, these are called simply "LED TVs."

They are not LED TVs. Calling them such makes as much sense as calling its existing line of LCD televisions Cold Cathode Fluorescent Lamp TVs, or CCFL TVs, after the lighting technology that they use.

Whatever its validity, the decision to drop "LCD" was a smart marketing move. After all, "LED" is the acronym du jour, a technology that's all the rage as a new, perhaps revolutionary lighting source. It's as emotive a term as "HDTV" and "digital" were in their heydays.

But it's also confusing consumers. An industry colleague told me that in a recent trip to a big-box retailer, he overheard several friends asking what type of TV they were watching. One said it wasn't LCD or plasma, it was an LED set.

More accurately, it was an expensive LCD set. LED-backlit LCD TVs can cost as much as twice their standard LCD or plasma counterparts. Is the extra money worth it, even if you can afford it?

Here are the answers to some questions you may have about LCD TVs using LED backlighting.

What's wrong with existing LCD TVs?

Up until now, LCDs used fluorescent tubes to light the screen. As a result, LCDs have trouble creating deep blacks. That's because fluorescent tubes are always on, and some light leaks through to the front of the display even when a part of the image is supposed to be black. A lack of deep blacks reduces the perceived sharpness of the set's image.

Also, fluorescents lack a wide range of colors; hence, color saturation is limited.

What's an LED TV?

It's an LCD TV that uses LEDs to illuminate the display. There are two ways to do this: either by placing LEDs across the entire back of the display, or by placing LEDs just around the perimeter, which is called an "edge lit" display. Both techniques use less power than plasma TVs and LCD TVs lit with fluorescent tubes.

Which technique is better?

They both have their pros and cons. LCD TVs using edge-lit LCDs can be ultra-thin, because the LED sources are on the side. Edge-lit LED-lit LCDs are also less expensive than LCD TVs using LED backlit technology.

On the other hand, LCD TVs that use LEDs across the rear of the display can create sharply deeper blacks, through a technique called "local dimming." When a scene calls for a dark image, the LEDs in that area can be shut off completely, so no light leaks through what should look black.

So if I want an LED-lit LCD, I should buy one using back-lit technology?

It's not so simple. An LED back-lit TV may contain only about 1,000 LEDs. And those LEDs can only be dimmed in large groups, because it is too expensive to control each LED individually. So when you shut off or dim a group of LEDs you may also be darkening part of an adjoining scene on the TV that really should be bright. If you cut back on the dimming, then the blacks will be less dark than blacks in another part of the image that are not surrounded by lighter images.

Theoretically, you could increase the number of LEDs so that each lit just one pixel on the 2 million pixel LCD screen. But then you could just throw away the LCD screen because you would have actually created an LED television — just like the Walgreens LED sign in Times Square.

O.K., but still, LCD TVs with LEDs have great contrast

Sometimes they do. It depends on what you're watching. As a Samsung engineer said, "the most dramatic effect of LED-lit TVs happens when the entire scene goes to black" — not necessarily when you're watching a scene with a mixture of light and dark images.

Do LED-lit LCD TVs produce better pictures than plasma TVs?

Interestingly, I've heard no one in the industry claim that they do. At best, they say that with LED-lit LCD TVs, plasma no longer has an edge when it comes to creating deep blacks and saturated colors.