

What's So Great About LED-Backlit LCDs?

LED-backlit LCD's are where TV's future and present meet—they're the best LCDs you've ever seen. They're not cheap, but they're not ludicrous either.

I'll CC You in the FL

With LCD's; it's all about the backlighting. This defines contrast, brightness and other performance metrics. When you watch plasma TVs, OLED TVs or even old tube TVs, there's light emanating from each pixel like it was a teeny tiny bulb. Not so with LCD—when you watch traditional LCD TV, you're basically staring at one big light bulb with a gel screen in front of it.

The typical old-school LCD backlighting tech is CCFL—a cold cathode fluorescent lamp—which is an array of the same kind of lights that make people's lives miserable in offices around the world. The reason they aren't the greatest as backlights for TV watching is that they light up the whole display. And because LCD is just a massive screen of tiny doors that open and close, light inevitably leaks through the closed doors when they're trying to show black resulting in more of a glowing charcoal. Check out this shot to see what I mean:



LEDs (light emitting diodes) are different from an old school incandescent bulb which heats up a filament to generate light. LED's are electroluminescent meaning electricity passes through a semiconductor and the movement of the electrons just lights it up. Instead of having one light bulb in the bottom of the screen, shining up through all of the LCD pixels, you can have arrays of LEDs that shine through smaller portions of the LCD screen, leaving other portions in the dark, so to speak.

LED Is As LED Does

Not all LED displays are created equal.



There are two major kinds of LED backlighting: Edge-lit and Full-Array local dimming. Edge-lit displays are what they sound like—the LEDs are arranged in strips running along all four edges of the TV as you can see in the above photo. Typical Edge-lit LCD's use up to 400 LED's. A light guide directs the light toward the center of the screen. The advantage of edge-lit displays is that they can get incredibly thin. But because they're still shooting light indiscriminately across the LCD panel, they can't pull off the black levels that a Full-Array local dimming backlight setup can. Also, the center of the picture can appear a touch dimmer than the edges. Samsung offers several models with edge-lit LED's.

LED backlighting of the Full-Array local dimming variety is how you build the best LCD TV in the world. It's called Full-array local dimming, as you probably guessed, because there are a bunch of LED bulbs— up to 1500 in the LG LH90 series—arranged in a grid behind the screen. These sets will be a bit thicker than the edge-lit sets but they can all be dark or brightly lit, or they can turn off individually or in clusters, making for the actual *Dark Knight*, rather than the *Grayish Knight* you'd see on cheaper CCFL LCD's. LG is a leader in these full-array LED backlit LCD's.