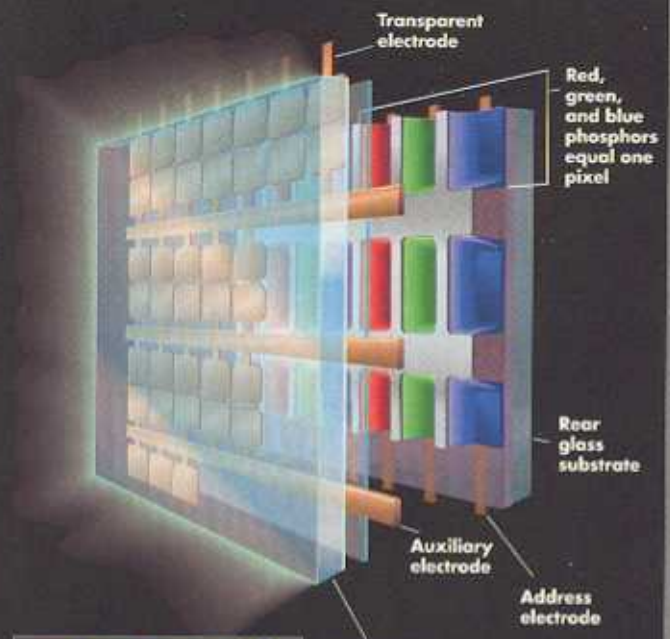


PLASMA

What It Is Just 3 to 6 inches thick, plasma TVs can be set up next to or mounted on a wall, preserving precious room space. Screen sizes range from 32 inches diagonal to a cinematic 63 inches, and at least one 71-inch model is in the wings.

How It Works Each pixel in a plasma display consists of three gas-filled sub-pixels (cells) coated with red, green, or blue phosphors. Electrodes above and below the cells (the top electrode layer is transparent) jolt them with varying amounts of voltage. This excites the gas in the cells, stimulating the phosphors to produce colored light.

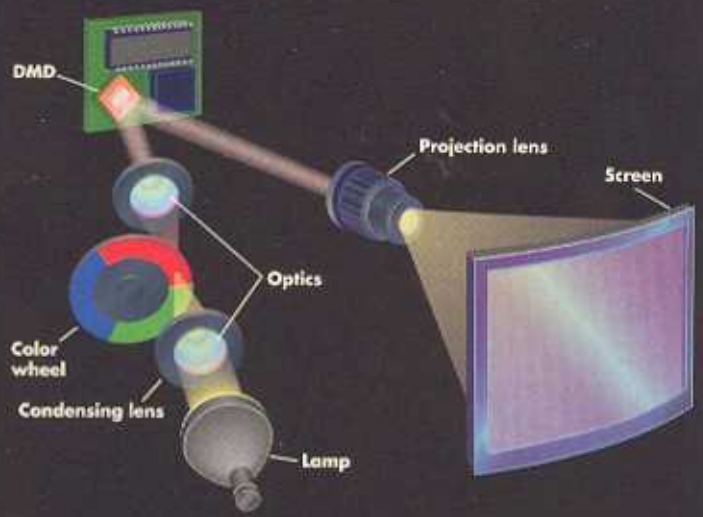
Pros

- Uniformly bright picture over a wide viewing angle — even in a brightly lit room.
- Svelte design and large screen size.
- Wide 16:9 aspect-ratio screen and enough pixels for HDTV resolution.

Cons

- Still expensive.
- On many sets, the black parts of the picture, like dark shadows or letterbox bars on widescreen movies, look dark gray instead of black. Good tube TVs generally produce better blacks than plasma models.
- Subject to burn-in, where an image becomes permanently etched onto the screen. But this won't happen unless you leave a bright stationary image on the screen for hours at a time. Newer models have burn-in prevention features like a "pixel orbiter," which exercises pixels by slowly shifting an image around the display.

Where It's At Just about every TV maker sells a plasma model. But these slim, sexy sets are still expensive, with Gateway's $2,000 42-inch enhanced-definition TV (EDTV) model representing the *low* end of the price scale. Expect to pay $3,700 to $9,000 for a 42-inch HDTV model, and $4,800 to $15,000 or more for a high-def model with a 50-inch or larger screen. Don't expect prices to fall to CRT levels for a few more years.



DLP

What It Is Rear-projection TVs can be slimmed down to less than 2 feet deep when chips are used in place of CRTs. One fixed-pixel technology, Texas Instruments' Digital Light Processing (DLP), offers a high-quality, less expensive alternative to CRT for front projectors. But manufacturers are also starting to roll out more affordable DLP-based widescreen RPTVs.

How It Works High-def DLP TVs use a 16:9 chip, called a Digital Micromirror Device (DMD), packed with nearly a million "micromirrors" that reflect light from a lamp onto a screen. DLP sets fall mainly into two camps. Single-chip RPTVs and front projectors filter white light from the lamp through a color wheel to produce color, while the more expensive ($23,000 and up) three-chip front projectors dedicate one chip each to red, green, and blue.

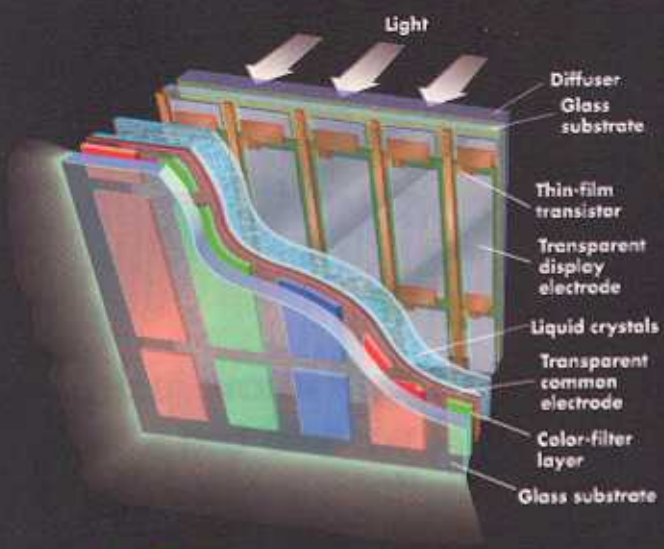
Pros

- While it can't yet reproduce dark scenes as well as CRTs do, DLP achieves deeper, more realistic shadows and blacks than any other fixed-pixel technology. That's because the pivoting mirrors on a DLP chip create black by reflecting light away from the screen. Also, because the DLP mirrors are so close together, most sets don't have a problem with the "screen door" effect (a faint image of the pixel grid).
- No danger of screen burn-in.
- DLP front projectors can cost less than comparable CRT models.

Cons

- DLP rear-projection TVs are more expensive than the same-size CRT sets.
- Single-chip DLP sets are prone to a "rainbow" effect. Although the color wheel that separates the white light spins very fast, you might see streaks of primary color if you look closely enough, especially from one side of the image to the other. But newer sets have faster color wheels that can dramatically decrease this effect.

Where It's At Many manufacturers offer DLP sets. Prices start at $3,000 for sets from LG and Toshiba. But don't rule out DLP front projectors. Basic models start at around $3,000, while HDTV-ready models range from $7,000 to $15,000. Prices of DLP sets drop every year, and the trend shows no signs of slowing down.



LCD

What It Is The granddaddy of fixed-pixel technologies, LCDs (liquid-crystal displays) first appeared in pocket calculators in the early 1970s. The technology is amazingly versatile, able to power front projectors, rear-projection TVs, *and* flat-panel displays. But LCDs are only now making headway in home theaters.

How It Works A matrix of thin-film transistors (TFTs) supplies voltage to liquid crystal-filled cells sandwiched between two sheets of glass. As with plasma panels, a trio of red, green, and blue cells make up one pixel. When hit with an electrical charge, the crystals "untwist" to filter light generated by a lamp behind the screen (for flat-panel TVs) or a lamp shining through a small LCD chip (for projection TVs).

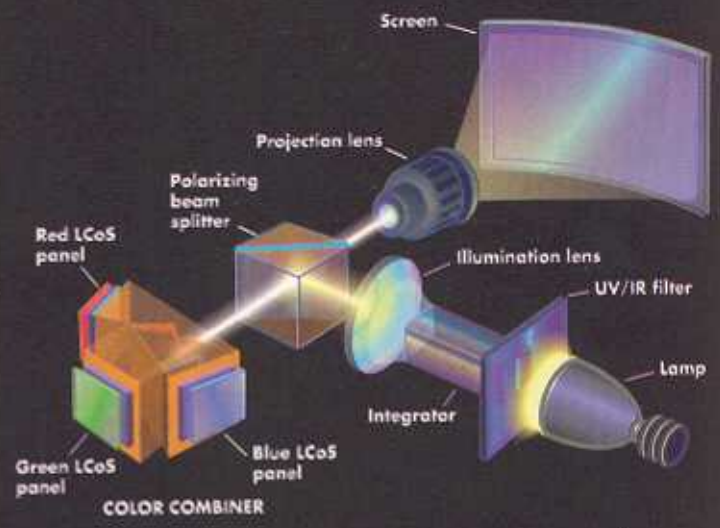
Pros

- Direct-view models are only a few inches deep.
- LCD front projectors and RPTVs deliver slightly better color than DLP sets because the chips for red, green, and blue can be individually adjusted. But newer DLP models are narrowing the gap with six-segment color wheels that use two segments each for the red, green, and blue primary colors.
- Using the same wattage lamp, a typical LCD projector will create a brighter image than a DLP model — but most DLP projectors produce enough light for just about any viewing.

Cons

- Of the fixed-pixel technologies, LCD has the most trouble with blacks. Some light always passes through when the crystals untwist, so the best black is usually a very dark gray.
- Because of how light goes through LCD cells, flat-panel displays usually have narrower viewing angles than plasma TVs.
- Low-resolution LCDs with big screens show pixelation and screen-door effects. Front projectors with XGA (1,024 x 768) or higher resolution have a reduced screen-door effect.
- Limited screen size — flat-panel LCDs currently max out at 46 inches (diagonal), although rear-projection sets have screens as large as 70 inches.

Where It's At High prices have slowed widespread adoption of LCD TVs, but for $2,800 you can now get rear-projection sets ranging from Sony's 42-inch model to Zenith's 52-incher. As with DLP, the LCD front projectors offer the greatest variety — and the best deals.



LCoS

What It Is The least-familiar player at the fixed-pixel poker table, LCoS (liquid crystal on silicon) owes most of its technological heritage to LCD. But it can outperform LCD because it uses smaller pixels that provide higher resolution and almost eliminate the screen-door effect. LCoS has great potential for home theater, but it's only available in a few products. (JVC calls its version of LCoS "D-ILA," for Direct-drive Image Light Amplifier.)

How It Works LCoS borrows from both LCD and DLP technology. Like LCD, each pixel in an LCoS display has liquid crystals that untwist to filter light, and — as the name indicates — these crystals are applied to a silicon chip instead of sandwiched between glass. As in DLP, light is reflected off the chip toward a screen. LCoS front projectors and RPTVs can be designed with either a single chip, using a color wheel or prisms to separate the light, or three chips, one for each primary color.

Pro

- LCoS rear-projection TVs clearly demonstrate the two major advantages this technology has over both DLP and LCD: resolution and pixel spacing. The pixel count of most current DLP and LCD displays max out at 1,280 x 720 and 1,366 x 768, respectively. But each of the three LCoS chips in most current sets is packed with 1,920 x 1,080 pixels — enough to display all the detail in a high-definition TV broadcast. And because the pixels are spaced closer than those of the other projection technologies, the picture is smoother even from close up.

Con

- Can be expensive.
- Unable to reproduce deep blacks.

Where It's At There were a number of LCoS front projectors and rear-projection TVs on display at the 2004 Consumer Electronics Show. JVC has a front projector, the DLA-SX21 ($9,995), and Philips has four single-chip LCoS rear-projection sets, starting at $3,499 for a 44-inch widescreen model. As with any emerging technology, some of the early products have had kinks to work out, but LCoS's resolution capability makes it a real contender among fixed-pixel displays. >HDTV