

Replacing Your Analog TV With a Digital TV

If you are like a lot of people you might be considering the purchase of a new flat screen television set. From a distance, these new televisions might seem a lot more complicated than what you grew up watching. In this article, we hope to provide you with a bit more information that will answer your questions.

Television Standards

Your old TV falls into a 'scan' resolution of 525 horizontal lines, of which 486 make up the picture. This is as defined by the National Television System Committee (NTSC) that dates back 60 years. The new digital TVs are covered by a different standard, defined by the Advanced Television Systems Committee (ATSC). The new digital TVs start with a lower resolution (standard definition or SD) set to 480 lines of resolution, and go all the way up to a high definition (HD) resolution of 1080p. These standards are used to help develop a universal set of rules and guidelines that manufacturers use to be sure that each set they make works like every other set covered by the standard. A primary difference between the old NTSC analog TV sets and the new SD digital TV sets is that the digital picture can be provided in either the conventional analog style aspect ratio (4.3) or in the new wide screen format (16.9).

Digital TV Sets

- *Resolution:* Digital signals can scan as either interlaced or progressive scan signals. You may have noticed that sometimes a digital program is advertised as being 480i and sometimes 480p. When the scan is interlaced (or 'i') the technology is fairly conventional, there are dual passes that create 30 frames per second. Progressive scanning ('p') is a technological change that allows all 480 lines to be scanned at one time. The higher resolution on a TV set, the higher the level of picture definition. To experience the full effects of true high definition (HD) video at 1080p the TV set you use must have 1080p capability.
- *Screen Size:* Screen size is also a major factor in resolution and picture definition. The smaller the screen size is, the less evident the changes in digital resolution definition. The larger the screen size, the more likely you are to see a relative improvement in video.
- *Other factors:* Digital TV sets will advertise the inputs available. All digital TVs are backward compatible with older technologies like VCRs, DVD players and cable set top boxes. These TVs should also have HDMI inputs for technologies such as Blu-Ray players, Internet video boxes, audio, computers, and new technologies that are not yet on the market.

Plasma vs. LCD (information according to cnet.com)

- Plasma screens use a matrix of tiny gas plasma cells charged by precise electrical voltages to create a picture.
 - Advantages over LCD-Better contrast due to its ability to show deeper blacks, better viewing angles, better fast moving video playback, a brighter color due to light leakage on an LCD affecting its color saturation, and price, particularly in the large screen end of the market.

Plasmas are generally cheaper than their LCD counterpart, although LCD TV sets have recently become very price competitive with plasmas.

- LCD screens (Liquid Crystal Display) are ‘sandwiches’ made up of liquid crystal pushed in the space between two glass plates. Images are created by varying the amount of electrical charge applied to the crystals.
 - Advantages over Plasmas –LCDs tend to have higher native resolution (more pixels on a screen), consume less power, better when hooked up to a computer, better template for video gaming, generally lighter in weight (plastic screen vs. glass screen often found in plasmas), longer lifespan than plasma, although many plasmas on the market today quote a lifespan of about 60,000 hrs., which is the same as LCD. LCD finally caught up to the quality of plasma with the introduction of LED backlighting. Instead of lighting the screen with fluorescent tubes, as is traditional, it uses banks of LED lights. You might have also heard that plasmas suffer from screen burn-in, which occurs when an image is left too long on a screen, resulting in a ghost of that image ‘burned in’. Newer plasmas are less susceptible to this thanks to improved technology.

If you are looking for a 50 inch or above television, plasma is a safe bet. An LCD is the way to go if you want something small and slim (17 to 42 inch TVs). Much of the research suggests that when buying a TV, make sure to stick with the big names such as Panasonic, Sony, Samsung and LG.

We are now in the digital age of television. The quality of pictures and sound is greatly enhanced and the quantity of programming has greatly expanded. The experience you have with digital television is only limited to the device you have with which to view it. NCC does have digital television sets on display if you would like to come in and look at them. We can also order and install a digital television for you. Call today for more information 568-3331. More information on buying digital televisions can be found at www.nccray.com.

More Info...Read On!

LCD TV vs. Plasma

Reviewer: Phil Connor

This is the #1 question for me at any dinner party: Which is better, LCD TV or Plasma? This is a much debated topic and a fun one. When choosing between plasma and LCD TVs, you're actually selecting between two competing technologies, both of which achieve similar features (i.e. bright crystal-clear images, super color-filled pictures) and come in similar packages (i.e. 3.5 inch depth flat screen casing). To complicate the decision-making process further, price and size are two previous considerations that are rapidly becoming non-issues as LCD TVs are now being made in larger sizes and at competing prices with plasma.

Despite their similarities, the two technologies are very different in the way they deliver the image to the viewer.

Plasma technology consists hundreds of thousands of individual pixel cells, which allow electric pulses (stemming from electrodes) to excite rare natural gases-usually xenon and neon-causing them to glow and produce light. This light illuminates the proper balance of red, green, or blue phosphors contained in each cell to display the proper color sequence from the light. Each pixel cell is essentially an individual microscopic florescent light bulb, receiving instruction from software contained on the rear electrostatic silicon board. Look very closely at a plasma TV and you can actually see the individual pixel cell coloration of red, green, and blue bars. You can also see the black ribs which separate each.

Whether spread across a flat-panel screen or placed in the heart of a projector, all LCD displays come from the same technological background. A matrix of thin-film transistors (TFTs) supplies voltage to liquid-crystal-filled cells sandwiched between two sheets of glass. When hit with an electrical charge, the crystals untwist to an exact degree to filter white light generated by a lamp behind the screen (for flat-panel TVs) or one projecting through a small LCD chip (for projection TVs). LCD monitors reproduce colors through a process of subtraction: They block out particular color wavelengths from the spectrum of white light until they're left with just the right color. And, it's the intensity of light permitted to pass through this liquid-crystal matrix that enables LCD televisions to display images chock-full of colors-or gradations of them.

LED TVs are a new form of LCD Television. The panel on an LED TV is still an LCD TV panel. The backlight is different though - changing from flourescent to LED based backlighting. See our complete coverage of LED TV articles and models here.

PICTURE CONSIDERATIONS:

CONTRAST / BLACK LEVELS

Plasma technology has certainly achieved quite high contrast ratios, a measure of the blackest black compared to the whitest white. Many plasma display manufacturers boast a contrast ratio of 3000:1 these days though our tests have not proven these numbers out. Panasonic has long been the leader in plasma black levels and we measure contrast of a 42" HD Panasonic plasma at about ANSI 1450:1 - still impressive. Plasma displays achieve such impressive black levels by using internal algorithms to block the power to particular pixels in order to render a pixel "dark" or black. While this can limit a plasma television's gray scaling, it does produce exceptionally black blacks - depending on the manufactured plasma display element (i.e. glass). A plasma TV uses the most power when it is producing full white. As a result, some 2nd tier manufactured brands of plasma TVs have an audible buzz or whining sound when displaying white or very light images. LCD (liquid crystal diode) displays, by contrast, utilize electric charges to twist and untwist liquid crystals, which causes them to block light and, hence, emit blacks. The higher the voltage passing through the liquid crystals in a given pixel, the more fully those crystals untwist and effectively block light - all of which makes these pixels darker.

As opposed to plasma, LCD TVs use the most power when displaying a very dark or black image. This is a difficult process, and despite recent improvements in LCD black levels, only the best LCD televisions (like those produced by Sharp and Sony) have managed to topple the 1000:1 contrast ratio barrier. Recent improvements have brought LCD displays up to the level of plasma. The one continual drawback here for LCD is off axis viewing, when black levels consistently drop.

ADVANTAGE: Closer than a year ago, but still Plasma. LCD TV manufacturers have made great improvements in black levels and in many cases have managed to match the contrast ratio of plasma displays. However, Plasma displays still maintain a clear advantage in this category due to fading blacks when viewing LCDs from off axis. For scenes with a lot of dark and light images shown simultaneously - as with content originating from DVDs, video games, and NTSC TV signals - plasmas still consistently outperform LCD TVs.

COLOR ACCURACY

In plasma displays, each pixel contains red, green, and blue elements, which work in conjunction to create 16.77 million colors. Insofar as each pixel contains all the elements needed to produce every color in the spectrum, color information was more accurately reproduced with plasma technology than it was with other display technologies. The chromaticity coordinates were more accurate on most plasma displays. Though the color saturation resulting from the pixel design of plasma displays is remarkable, LCD technology has nearly caught plasma in gray scaling color accuracy. Plasma continues to exhibit more richness in color information and more natural coloration. Today, SMPTE color coordinates in top plasma displays still normally outperform those in LCDs, which tend toward oversaturation.

LCD TVs reproduce colors by manipulating light waves and subtracting colors from white light. This is an inherently difficult template for maintaining color accuracy and vibrancy - though most LCD displays manage quite well. While color information benefits from the higher-than-average number of pixels per square inch found in LCD televisions (especially when compared to plasmas), LCDs are simply not as impressive as plasmas with similar pixel counts. LCDs however, produce a typically brighter picture. Greens sometimes look over-green and reds can run a bit warm, but in a room with bright outdoor lighting, an LCD TV would be my choice.

ADVANTAGE: Preference to plasma but depends upon room light, manufacturer and model. Plasma color richness and naturalness will prevail in rooms with lower to normal lighting. LCDs will be better in very brightly lit rooms due to their inherent anti glare technology and brightness.

VIEWING ANGLES

Plasma manufacturers have made much of their 160° viewing angles, which is about as good as horizontal and vertical viewing angles get. This owes to the fact that each pixel produces its own light, rather than light being spread across the screen from one central source. Hence, each pixel is more readily visible because its brightness is consistent with every other pixel on the screen. One consistent area of superiority of plasma viewing angles is demonstrated when viewing dark material content, especially DVDs. A Plasma

display holds the black levels from off axis, while LCD TVs lose black level intensity more as the angle off axis increases. This usually occurs after around 90 degrees. LCD TV manufacturers have done much to improve their displays' viewing angles. The substrate material on newer-generation LCD models by Sharp and Sony has helped to expand those units' viewing angles, though they still have some ground to cover before catching plasma. Expect the best LCD HDTVs to have between 120 and 130 degree viewing angles.

ADVANTAGE: Plasma

FUNCTIONAL CONSIDERATIONS:

COMPUTER USE

LCD flat screens display static images from computer or VGA sources extremely well, with full color detail, no flicker, and no screen burn-in. Moreover, the number of pixels per square inch on an LCD display is typically higher than other display technologies, so LCD monitors are especially good at displaying large amounts of data - like you would find on an Excel spreadsheet for example - with exceptional clarity and precision. For the same reasons, LCD TVs will also be a slightly better template for video gaming.

Plasma technology has increased anti burn in tactics as well as computer and static signal handling. There are still issues with each depending very much on the model and manufacturer. For example, most EDTV plasma displays do not handle a computer input well and product a very jaggy image when viewing static images from same. Users may want to consider a commercial version plasma if their application calls for a lot of computer use.

ADVANTAGE: LCD

FAST-MOVING VIDEO PLAYBACK

Plasma gets the nod here because of their excellent performance with fast-moving images and high contrast levels. There are still some 2nd tier manufacturers whose plasma product displays some phosphor lag, a drag time in scenes changing from bright to dark. While the "response time" of LCD TVs has markedly improved in the last couple of years, they still suffer from a slight "trailer" effect, where the individual pixels are just slightly out of step with the image on the screen. During fast moving sports scenes, the most discerning eyes can detect this slight motion response lag. LCD Manufacturers have been steadily increasing refresh rates to combat this.

ADVANTAGE: Plasma

HIGH ALTITUDE

There is a reason LCD flat panels are the preferred visual display units for use on airplanes: LCD TVs aren't affected by increases or decreases in air pressure. Their performance is consistent regardless of the altitude at which they're utilized.

This is not the case for a plasma. The display element in plasma TVs is actually a glass substrate envelope with rare natural gases compressed therein. So, at high altitudes (6,500 feet and above), an air-pressure differential emerges, which causes plasma displays to emit a buzzing sound due to the lower air pressure. This noise can sound rather like the

humming of an old neon sign. NEC has been effective in producing several plasma models that are rated to 9,500 feet.

ADVANTAGE: LCD, at 6,500 feet and higher.

LONGEVITY

LCD television manufacturers claim that their displays last, on average, 50,000 to 65,000 hours. In fact, an LCD TV will last as long as its backlight does - and those bulbs can sometimes be replaced! Since this is nothing more than light passing through a prismatic substrate, there is essentially nothing to wear out in an LCD monitor. However, one nasty little known fact about LCD technology is that as the backlight ages it can change colors slightly (think of florescent office lighting). When this occurs the white balance of the entire LCD TV will be thrown for a loop and the user will need to re-calibrate, or worse, try to replace the backlighting or ditch the unit altogether. Some of the early purchasers of larger LCD screens will be learning this tidbit in a couple of years. One thing that I've found in this industry, it is not easy to find out whether the backlighting on LCDs can be replaced. Manufacturers are either hesitant to discuss the topic, or they just don't know. Plasma, on the other hand, utilizes slight electric currents to excite a combination of noble gases (i.e., argon, neon, xenon), which glow red, blue, and/or green. This is an essentially active phenomenon, so the phosphoric elements in plasma displays fade over time. Many manufacturers state a new half life of 60,000 hours. While I am skeptical of this spec, I do believe strides have been made to nearly even the playing field with LCD. At half life, the phosphors in a plasma screen will glow half as brightly as they did when the set was new. There is no way to replace these gases; the display simply continues to grow dimmer with use.

ADVANTAGE: Even, depending upon manufacturer quality.

SCREEN BURN IN

LCD technology is not prone to screen "burn-in" or "ghosting" (premature aging of pixel cells) due to the nature of the technologies "twisting crystals."

With plasma, static images will begin to "burn-in," or permanently etch the color being displayed into the glass display element. The time it takes for this to occur depends greatly on the anti burn-in technology of the manufacturer. Recent improvements by plasma manufacturers have certainly extended the time it takes to burn in a plasma pixel cell. In the past I was concerned to place a DVD on pause 15 minutes. Now, many of the enhancements such as better green phosphor material, and motion adaptive anti burn-in technology are greatly reducing the risk of burn in. It's gotten so much better that I don't even worry about it anymore. In a new model plasma from any top tier manufacturer I would put "ghosting" estimates at an hour or more now (Ghosting can be "washed" out by displaying static gray material). Permanent burn-in I would put at more than 10 hours.

ADVANTAGE: LCD, though not as much a concern as it was a year ago.

OTHER CONSIDERATIONS:

PRODUCTION SIZE AND COST

All television measurements are stated in inches and are for diagonal measurement of the screen from corner to corner - not including framing.

Both plasma and LCD TVs are becoming more readily available in larger sizes though plasma still leads the size battle by a great margin. Pioneer and LG produce 61" plasma sizes while Panasonic has a readily available 65" model. Though it is not being imported into the U.S. yet, Samsung has produced a gigantic plasma of 100 inches. Though such mammoth monitors are expensive, they exhibit none of the "kinks" one might expect with such large displays. In other words, even the largest plasma displays are reliable. Large plasma displays will consume power - try 675 watts for a 65 "display compared to around 330 watts for a 42" plasma.

The substrate material for LCD TVs has proved difficult to produce in large sizes without pixel defects owing to faulty transistors. Sharp produces one of the largest available LCD displays at 45 inches, while Samsung has a 46" LCD. Sony and NEC currently produce units measuring 40" diagonally. This will change very soon. These manufacturers will have very large LCD screens here this year if production goes as planned.

ADVANTAGE: Plasma, though the playing field is leveling. Even though production costs and retail prices have come down for both technologies, plasma still has the edge as far as production cost and capacity go.

POWER CONSUMPTION

Because LCDs use florescent backlighting to produce images, they require substantially less power to operate than plasmas do. LCD TVs consume about half the power that plasma displays consume. The reason: Plasmas use a lot of electricity to light each and every pixel you see on a screen - even the dark ones. Though plasma manufacturers have improved voltage consumption requirements a plasma TV will consume around a third more power for the same size display.

ADVANTAGE: LCD

PRICE AND RESOLUTION

LCD HDTV displays will have a higher resolution per same size comparison than plasma. The lowest resolution of a 40 inch LCD will be 1366 X 768 - easily full HD resolution in 1080i or 720p. A 42 inch HD plasma has a resolution of 1024 X 768. While this is not truly an HD resolution, it's close enough so that it's difficult to know the difference. A 50 inch plasma TV will have a resolution of 1366 X 768, while a 45 inch LCD displays 1920 X 1080 (1080P) resolution.

Those extra pixels and the production process of LCD HDTVs cost more money to produce. Expect to pay a third as much more for a similar size LCD TV than a plasma display.

ADVANTAGE: It's currently a toss-up.