Plasma vs. LCD Technologies Demystified

Taken from "Mythbusting – Just the Facts on Plasma TV Performance," Eric Haruki and Bob O'Donnell

Today's couch potatoes are finding their brains a bit mashed when the subject turns to upgrading their favorite news/entertainment delivery device. In fact, buying a new TV has quickly become one of the most confusing and challenging purchase decisions that consumers now face. Between the transition to digital TV and HDTV programming, and the overabundance of TV types, technologies, and terminologies, it's no wonder modern TV buyers can't separate fact from fiction. Most television vendors sell TVs using several display technologies so that they're able to offer consumers the widest variety of TV sizes, shapes and. most importantly price points. One of the most bewildering aspects of the buying process involves the technology used in generating the image on the screen. Specifically, the qualities and characteristics of plasma and LCD TVs are poorly understood and subject to a great deal of misinformation.

Plasma vs. LCD: "Burn in"

"Burn in" or "image retention" is the tendency of a display monitor to hold an image outline in the screen after the system is turned off or the projected image has changed. This was a problem in early plasma TV displays and is often used as an argument against plasma technology. However, modern plasma TVs enjoy a combination of more robust screen materials and subtle image-shifting technologies that have rendered this former issue moot. During a controlled experiment, the "burned-in" image completely disappeared from all three tested plasmas leaving no trace after regular video material (a DVD movie set to continuously loop) was played through the sets for 24 hours. Therefore "burn-in" is no longer an effective argument for or against either technology.

Advantage: None

Plasma vs. LCD: Video Image

In a video image the amount of "black" has a profound impact on the range of colours that are visible to our eyes. Contrast ratio on the other hand, which essentially measures the difference *between* the black and white signals, is not a good indicator of image quality. Displays with high contrast ratios may still look washed out if the white levels are extremely high, but the black levels are only modestly low. Also, the human eye can only discern a contrast ratio of around 800:1 and *all* plasma and LCD monitors are above that ratio. Therefore when considering TVs keep in mind that when you hear of contrast ratios of 1,000,000:1, this little more than marketing and it is actually the black level that matters.

When measuring black levels plasma TVs as a group actually outperform the LCD TVs. The tangible benefit of this is that a deeper range of colours can be displayed, which translates into a richer overall picture.

Advantage: Plasma

Plasma vs. LCD: Viewing Angles

One of the frustrations to a viewer of flat-panel TVs is that the image quality seems to be affected depending on the angle of the viewer to the screen. In a room with seating off-centre this can be a real detriment with only a few prime viewing positions available. Once again, as technology for both LCD and Plasma TVs has been developed, the impact of viewing angle has diminished. But when current viewing angles for plasma TVs were compared with LCDs it was found that plasmas were the most consistent. In other words, regardless of where you are in the room, the image quality on a plasma monitor will look very similar. Also, even if you're seated in a fixed position, you won't be able to see any difference when, for example, a person walks across the screen or a football flies from one end of the screen to the other.

Advantage: Plasma

Plasma vs. LCD: Brightness

The human eye is more sensitive to brightness than to variations in colour and therefore, most people will perceive a brighter TV as being better. In factory settings the LCD TVs had brighter pictures when viewed head on, which could make them a better choice in rooms where viewing positions are limited. When tested from different angles, however, both the overall brightness and the colour performance varied on the sets using LCD—see above.

Advantage: LCD

Plasma vs. LCD: Colour Accuracy

When it comes to colour accuracy, the end goal for all televisions continues to be SMPTE (Society of Motion Picture and Television Engineers) standards, which are red, green, and blue colour frequency specifications that Hollywood producers adhere to in the mastering of their content. Plasma TVs generate colours that are closest to that of HD SMPTE, particularly with low brightness (e.g., movies) signals when compared to LCD TVs.

Advantage: Plasma

Plasma vs. LCD: Price

Of course, there's more to the TV purchase decision than performance. Price, in particular, plays a critical role. In that regard, plasma TVs are more expensive, with an average price roughly $200 higher than comparable LCD model.

Advantage: LCD

Summary:

So what's the verdict? Well, that depends on your needs. Plasma TVs are an excellent choice for consumers who are willing to pay the slightly higher relative price and want accurate image re-creation, particularly in viewing environments with controlled lighting. LCDs on the other hand, may be more attractive if you have an un-controlled lighting situation with straight-on seating and have a more constrictive budget.

Either way, we hope this helped shed some light on the debate. A new LED TV is on the way and once they are in mass production we will do this all over again!