



Whitepaper on Multimedia Projection Technologies

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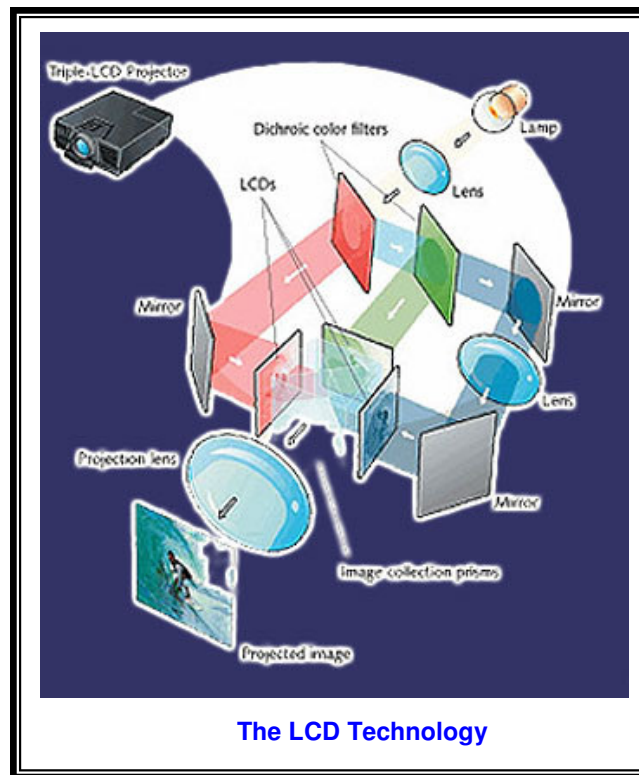


The most widely used technologies worldwide as far as Data / Video Projection are concerned could be categorized as:

1. LCD (Liquid Crystal Display) Technology
2. DLP (Digital Light Processing) Technology

1. The LCD (Liquid Crystal Display) Technology

LCD technology is the most widely used technology worldwide in Data / Video Projectors. It started with Amorphous Passive Matrix LCD's 10 years ago and today we have Polysilicon (Psi) Active Matrix LCD based projectors. A LCD Projector uses 3 x LCD Panels in the optical engine



The optical engine is a combination of LCD's, Dichroic mirrors & prisms and a low wattage lamp.

Advantages of LCD based projectors

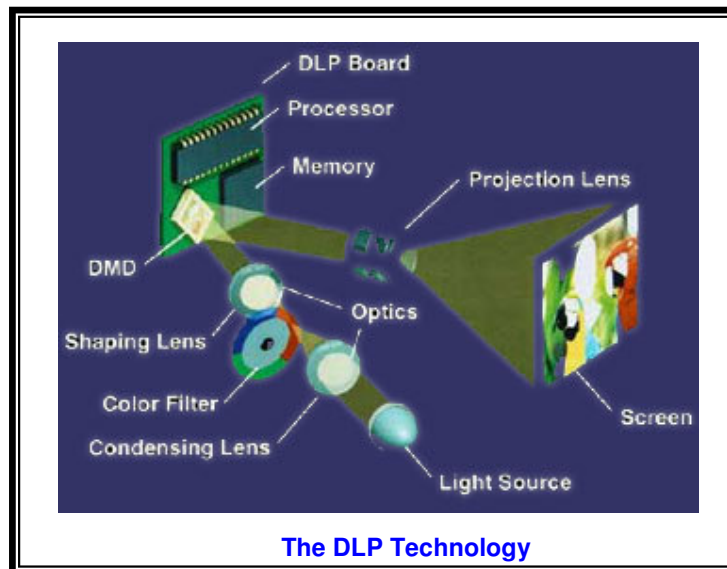
- Better colour reproduction when compared to any DLP based projector
- Because of the Low wattage lamps used in these projectors the heat generated is very less and thereby makes the projector more durable
- The lamp life of the lamps used in these projectors is between 1000 to 4000 hours
- Since 3 LCD's Red, Green & Blue are used in these projectors. The user has an option of customizing the RGB tones individually through the Projector controls. This facility is available only in LCD based projectors
- Superior video quality with natural colour tones
- Brightness uniformity around 85-95%

Disadvantages of the LCD based projectors

- Some LCD based projectors have a problem of RGB convergence over a few years of usage. The latest LCD based projectors however, have a fixed LCD optical engine with the Panel-on-Prism technology whereby this problem is eliminated
- LCD based projectors are slightly larger in size
- The LCD based projectors are comparatively costlier to manufacture

2. The DLP (Digital Light Processing) Technology

The DLP technology is a relatively recent development in the Projector industry. The DLP based projectors have a DLP engine, which consists of a DMD (Digital Micromirror Device) chip. Ideally a 1.3 inch SVGA DMD chip has a vertical and horizontal array of 600 and 848 mirrors respectively. Each mirror is of 1/100th size of a human hair. The lightpath in this engine is reflective i.e. The light is made to pass through an RGB colour wheel that is rotating @ 7200 rpm. The light then falls on the DMD chip and each corresponding mirror reflects back the signals into the condenser lens. The DMD micromirrors move at a deviation of $\pm 10^\circ$ and flickers @ 27 times per second.



The new version of DLP's is called Micro-DLP, where the DMD chip size is reduced to 0.76 inches. As a result the optical engine of this projector is very small in volume and weight. The projectors in this category are as light as 1.3 - 2.5 kgs. These projectors project any resolution from VGA to SXGA and at a decent brightness level of 800 to 1100 lumens.

However, do not get misled by the word "Digital" in DLP. The word indicates that the light processing in the projectors is digital, which is true even for LCD based projectors!!! At times certain over zealous vendors offering DLP based projectors try to extra-emphasise the word – 'Digital'.

Advantages of DLP based projectors:

- The single chip assembly of these Projectors is cheaper to manufacture, so the cost is comparatively lesser
- DLP based projectors are smaller in size

- The fill-factor at each pixel clock level in the DLP projector is higher compared to the LCD-projectors

Disadvantages of DLP based projectors :

- Comparatively, the colour reproduction in LCD based projectors is better
- The video quality is better in LCD based projectors
- Brightness uniformity around 70%
- The lamp life of the lamps used in these projectors is very less (around 500 to 1000 hours). Check for the newer models with 2000 hours lamp life
- A DLP based assembly has a light dump / absorber to capture the excess light. This process coupled with the small size, causes the projectors to heat up very fast. Hence one can use it at a stretch for just about 3-5 hours before it shuts down. The heat thus generated also reduces the efficiency of the engine and consequently the life of the projector

To conclude we can safely say that LCD and DLP are parallel technologies & have no prominent advantage over each other (no matter what the marketing companies tell you!). The best way to decide is to test the projectors during the demonstration to find which one would suits you. After all ... seeing is believing.

Things to check in a projector			
Sr. No.	Test for	Test procedure	Desired result
1	Flickering	Display the Windows shutdown screen through the projector	No horizontal flickering or vertical bars seen
2	Misalignment	Check a white line on a black background	The white line is not shaded by red, green or blue colour
3	Brightness Uniformity	Display a white screen through the projector	Output is equally white at the corners vis-à-vis the centre
4	Compression	For SVGA projector - View XGA & SXGA through it. For XGA projector - View SXGA & UXGA through it	Acceptable image display with compatibility with 2 resolution higher
5	Colour Reproduction	Compare colours on the PC monitor & on the screen	Identical matching of colours
6	Colour Compatibility	Display all the colours on a PowerPoint slide through the projector. [Right click on blank slide – click 'Background' – press down key on your keyboard – click 'More Colours' – zoom the image to 400%]	There is not shimmering / flickering on any colour
7	Rugged-ability	Put on non stop run for 8 hours	Projector does not trip off
8	Ease of use	Try the remote mouse yourself	User must be able to navigate mouse as well as open/close files easily

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