LCD vs LED Video Walls

What's the difference?

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White Paper | LCD vs LED Video Walls

What's the difference?

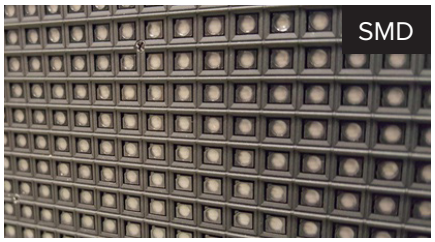
What's the difference between LCD and LED? Which video wall product is best for you? Well, just like anything else, it depends. LCD and direct-view LED are powered by different technologies and have unique advantages and disadvantages. We created this white paper to help you understand the strengths and limitations of both technologies and what would be best for your application.

WHAT'S THE DIFFERENCE BETWEEN LED AND LCD?

Let's start with understanding the two technologies and how they work.

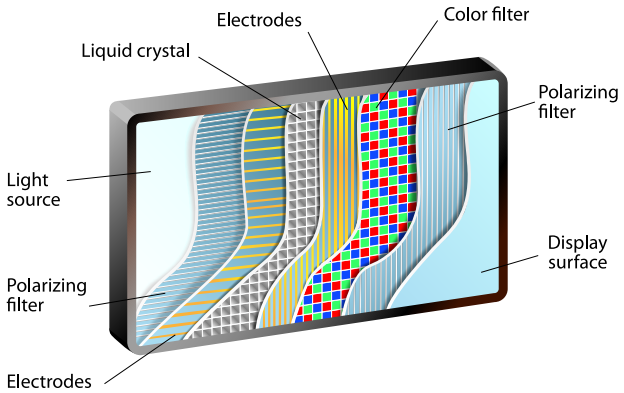
LED

LED stands for Light Emitting Diode. There are three main LED types; DIP, SMD, and COB. During manufacturing, DIPs (Direct In-line Package) have a red, green and blue LED encapsulated in a bulb and then placed on the Printed Circuit Board (PCB). The SMDs (Surface Mounted Diodes) are mounted directly to a PCB in one slim package. COBs (Chip On Board) are bare LED chips that are mounted directly on the PCB and then covered with a protective coating.



LCD

LCD panels are made of a layer of liquid crystal between two pieces of polarized glass. Liquid crystal cannot emit light; therefore, backlights are used to illuminate the display.



ADVANTAGES AND DISADVANTAGES

So, now that we understand the difference between the two technologies, let's consider the advantages and disadvantages of direct-view LED and LCD video walls.

	LED	LCD
TECHNOLOGY	Light Emitting Diodes produce direct-view light when electricity is applied, emitting color with no need for backlighting.	Liquid Crystal Display - crystals inserted between polarized glass that shift to create an image when electricity is applied. Often backlit to overcome room lighting.
USE	Indoor & Outdoor	Indoor & Outdoor (at much lower brightness levels)
DESIGN	• Available in many unique shapes, curves and flexible sizes. • Installations can be flat, angled or curved to fit most any design. • Any image size and aspect ratio can be scaled.	• Fluorescent lamps, rather than smaller LEDs result in thicker configurations. • Display installations limited to flat or angled at seams. • 16:9 aspect ratio only.
VISIBILITY	• Seamless. • Fine pixel pitch needed for close audience. • Wider viewing angles.	• Bezels (borders around each panel). • Better for close viewing (especially text). • Narrow viewing angles.
PICTURE QUALITY	• Brighter (typically 1,000 to 10,000 nits). • No glare. • No visible seams between panels. • Achieves true black. • Vast color spectrum. • Best color accuracy. • Higher refresh rates (typically 2,880 - 3,840 Hz) • High contrast. • Unmatched color uniformity.	• Dimmer (typically 300 to 1,500 nits). • Glare with ambient or bright lights. • Seams (bezels) between LCD panels create distracting "window" look. • Vibrant, fluid colors. • Higher resolution at close viewing. • Lower refresh rates (typically 60 - 240 Hz). • Lower contrast (less color differentiation). • Image retention on static displays.
ENERGY CONSUMPTION	• More energy efficient. • Longer life (50,000 - 100,000 hours).	• Less energy efficient (requires more power to operate). • Shorter life (under 50,000 hours).
COMMON APPLICATIONS	Large Scale Displays, Control Rooms, Broadcast Studios, Stadiums/Arenas, Airports/Transit Stations, Lobbies, Conference Rooms, House of Worship, Education	Restaurants, Education, Conference Rooms, Hospitality, Digital Signage
COST	• Higher initial cost when compared to same size LCD display. • Installation may require custom fixtures. • Lower repair/service cost over life of the product.	• Lower initial cost when compared to same size LED display. • Standard installation fixtures. • Higher repair/replacement cost over life of product.

Which would be best for my application?

When comparing LCD vs LED, there are a few main things you should take into consideration.

- Location (indoor vs. outdoor)
- Design Complexity
- Viewing Distance and Angle
- Budget
- Overall Goal of the Application

As you've read, there are advantages and disadvantages to both technologies and what's best for your application is highly dependent on the criteria above. While there are LCD screens that have been developed for outdoor use, LED video walls are the preferred choice for outdoor applications because they are brighter and don't produce any glare.

Next, if your project is a small, simple rectangular design requiring a 16:9 aspect ratio, an LCD video wall could suffice. If your design includes a unique shape, specific size, or a curved display, then an LED video wall is your best option.

Your audience's distance and viewing angle of the display is another thing to consider. LCD video walls are a good option if the viewing distance is relatively short and viewing angle isn't very wide. On the other hand, LED video displays have a much larger viewing distance and angle.

As with any project, your budget is also a major consideration. In general LCD video walls have a smaller up-front cost but have a shorter lifespan and higher repair costs. (Higher repair costs are due to the fact that you typically cannot repair the screen and are required to purchase a completely new screen.) LED video walls have a slightly higher up-front cost, but last longer. Individual LED diodes and modules can be repaired or replaced, keeping maintenance costs low.

Lastly, the overall goal of the application should be considered before you decide on an LCD or LED video wall. The video wall could be used as a communication tool, a source of entertainment, a backdrop of a broadcast studio, a work of art, or multiple goals depending on the situation. Understanding the difference between the two technologies and the end goal of the display will help you select an LCD or LED video wall.

Still have questions about whether direct-view LED or LCD is right for your application?

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(877) 356-3684
sales@neoti.com
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P.O. Box 444
910 W. Lancaster St.
Bluffton, IN 46714
(260) 494-1499
sales@neoti.com

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We provide multi-tiered installation services depending on your comfort level with LED installations. We also offer installation training to our integrators that want to complete the installation themselves. We even provide service and maintenance packages through our NeotiCare program.