

Commercial Grade Large Format Displays Vs. Consumer Televisions

What are the advantages of a professional large format display over a consumer television - and when are the differences of vital importance?

Summary

Without the technical background, many people would not distinguish any difference between a large format display (LFD) and a consumer television (TV) on first sight. Outward appearances may seem identical leading them to question how a LFD justifies its significantly higher initial price tag compared to televisions. Nevertheless, it is important not to confuse these two technologies, since their functions and corresponding application areas vary on a huge scale.

Consumer televisions are designed for domestic use while large format displays are typically optimized for a special application such as in meeting rooms or for digital signage. The goal of companies like NEC is to present a broad portfolio of displays offering different functionality, thus enabling individual customers to select the best-fit solution according to their requirements. This whitepaper is aimed at communicating the different aspects and situations in which televisions are not fit for purpose. Issues such as flexibility for creative installations, addressing sufficient operating hours in retail stores or having the right inputs for corporate meeting rooms; professional large format displays will fulfill these requirements while televisions will most likely lead to a significantly higher overall cost.



Visual requirements

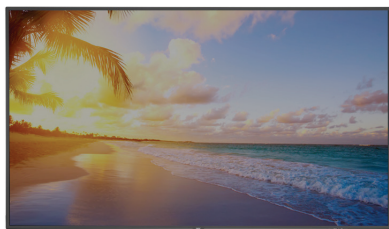
In general, the purpose of a large format display, in all application areas, is to show content. Often, it is required to attract viewers and make them aware of important information or to highlight advertisements via digital signage. Therefore, it is paramount to aspire to the best possible visual conditions regarding your content and ensure flawless visibility. To achieve peak picture quality, there are various aspects to consider.

Brightness

Depending on the ambient light, it is necessary to have a minimum brightness level to guarantee sufficient visibility. Typically, airports and modern offices are flooded with light via glass atriums and facades, these and other equally bright spaces require displays to deliver brightness of 700cd/m² or even more, however, domestic televisions rarely surpass 300cd/m². Large format displays usually provide a high ($\geq 700\text{cd/m}^2$) or moderate (350-500cd/m²) brightness output suitable for common light conditions, ensuring effortless readability even in challenging circumstances.



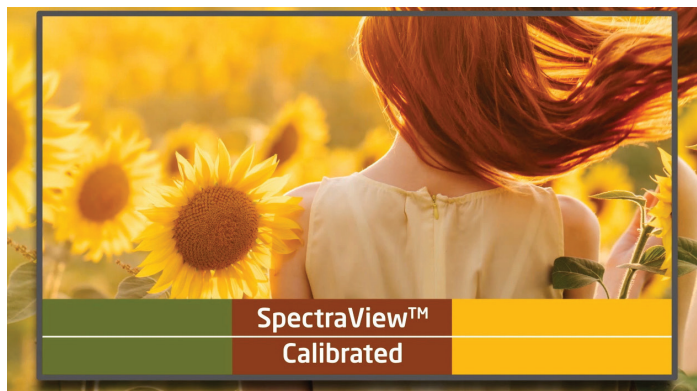
Higher brightness levels with professional LFDs



Lower brightness from consumer TVs

Uniformity

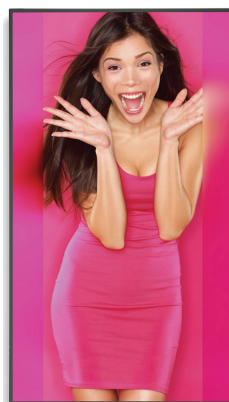
Using high-end components, professional LFDs aim to achieve the best possible picture quality without compromise, while televisions prioritize competitive consumer pricing over quality. NEC displays take even further steps towards superior imaging by using special diffuser sheets for best uniformity. This technology balances brightness levels across the entire surface area to prevent dark spots at the edges of the display.



Reliable and natural color reproduction with SpectraView

Reflection

Reducing the surface reflection in addition to a sufficient brightness level is one of the key advantages of commercial grade large format displays. In doing so, NEC relies on an advanced anti-reflection haze filter. The anti-glare surface treatment reduces reflection to a minimum and achieves advanced visual conditions even in a bright environment. Even when installed in situations where there is an influx of ambient light, such as the check-in counter at an airport, the high haze filters will minimize the reflection of this light and ensure the content is visible to onlookers.



Clear image perception thanks to reduced glare



Visual disturbances due to glossy screen surfaces

Color accuracy

Professional large format displays often have pre-calibrated factory settings to guarantee accurate colors. In addition, colors can either be individually adjusted via the OSD or calibrated externally ensuring customers can achieve exactly the picture they want. The situation with consumer TVs where this professional calibration is not available could cause colors to look blurry and washed out. Most NEC displays feature a SpectraView™ Engine which is constantly running in the background to control the parameters of the display regarding color accuracy, uniformity and aging. This is very important for customers where accurate color reproduction is vital.



Poor color reproduction without calibration functionality

Operational requirements

The improvement of visual quality is a constant process. To ensure reliable performance even with rising operational requirements, large format displays have many features to improve their robustness and longevity.

Heat protection and panel lifetime

Large format displays are designed to deliver a flawless performance even while exposed to the toughest conditions. For uninterrupted operation up to 24 hours a day without loss of quality or damage to components, heat protection becomes a serious issue. NEC displays are designed to benefit from excellent heat flow - the heat, generated from the backlight or the power-supply-unit, has a dedicated means to disperse, regardless of whether the display is installed in landscape or portrait mode. Temperatures inside the display are constantly controlled via sensors located next to critical components to provide an early-warning if necessary. If the temperature threshold is reached, the display activates fans to blow out the hot air and lower temperatures inside the unit. Once the display has returned to a low temperature level, the sensors will trigger fans to de-activate. The selection of the right LCD panel is essential for professional large format displays. In doing so, NEC carries out an evaluation of different panel candidates before moving to mass production. Televisions are still facing issues when it comes to image retention. Especially for digital signage where static pictures or symbols are common, it is essential to take measures against "burn-in". By using professional LCD cells and offering a pixel-shifting mode, NEC displays are eliminating the occurrence of image retention. Using all these measures, a much improved panel lifetime can be achieved.

Operation

Technologies like these alongside other quality components are working together to accomplish a reliable long-term performance. Depending on customer requirements, many NEC large format displays can operate up to 24 hours, seven days a week. Televisions are not designed for continuous operation. The price conscious construction typically allows a maximum of eight hours runtime before exposing components to high risk of severe damage due to overheating.

Connectivity and remote control

Another big advantage of large format displays is the many options to connect the content source to the screen. Connectivity in televisions is aimed at standard consumer devices and their related input signals (HDMI, USB) because they rarely need other options in this segment. For professional AV applications though, it is often necessary to have flexible connectivity options. Many NEC displays support Open Pluggable Specification (OPS) and allow for additional terminals (e.g. HD/SDI, 3G/SDI, HDBaseT) and even allow for embedded computing through a Raspberry Pi™ Compute module to achieve a seamless connection between source and display without any further need for external computing equipment, cabling or mounting.

Orientation

To embrace a creative and flexible installation, large format displays usually support portrait orientation in addition to standard landscape orientation. With some large format displays, even a face up or face down installation becomes possible. Televisions however typically support landscape orientation only, thereby limiting their flexibility.



Display operating in Portrait mode



Display operating in Landscape mode

Standard

In simplified terms, the requirement for a digital signage display is to show content without any interferences. Interferences may not only be technical failures, but also unauthorized users sabotaging signage displays via remote infrared or even via buttons located on the display. With a consumer television, it would be easy for someone to change settings or switch the power off, maybe even by accident. Professional signage displays provide special precautions such as infrared control, lock functions for buttons and PIN protection for the OSD to restrict unauthorized individuals from accessing settings. Not only do they restrict unauthorized access, they also offer advanced accessibility for administrators. NEC's NaViSet Administrator 2 Software is a tool to control every display in a network from a central location. The software enables access to all the displays settings and further functions such as power control, scheduling and email notifications in case of hard-/software failures.

Investment security

Price and total cost of ownership

Using televisions for professional signage applications will result in constant maintenance and adjustments, while professional large format displays will proactively prepare you for any potential issues thus eliminating downtime. Replacing a non-functioning television requires additional labor and equipment to swap the unit, during which time your message is no longer being communicated to your audience. As an investment for your business, LFDs are designed to be a reliable asset, specially optimized to perform perfectly, fit for purpose, without any compromise to quality. It would be inadequate to consider digital signage as a simple additional accessory to your business, it has proven its worth as a permanent solution bringing significant business benefits. As an investment therefore, a predictable long-term total cost of ownership is far more important than a low initial cost. NEC is well positioned to become a dependable partner to your business with a portfolio which presents you with the perfect-fit solution at an attractive investment.

Warranty

NEC displays are long-term solutions, designed to work for many years without any compromise to picture quality or functionality. Even though we believe in our products and failure rates are extremely low, we do understand that for an investment such as this, security is a key aspect. Because of this, NEC offers a standard three to five year warranty for guaranteed performance along with various upgrades. During the product's life cycle, NEC offers various services for repair and return of product to prevent long downtimes or other issues for our partners.

	Brightness	Haze	Operation	Orientation	Input Signals
E Series	350cd/m²	1 - 5%	16/7	Landscape	HDMI, VGA
C Series	43" - 55": 400cd/m²	44%	24/7	Landscape, Portrait, Face Up	DP¹, HDMI, VGA
	65" - 98": 350cd/m²	28 - 44%			DP¹, HDMI, OPS Slot, Compute Module Slot
V Series	32": 450cd/m²	1%	24/7	32" Landscape, Portrait	32" DP¹, HDMI, DVI-D, VGA, OPS Slot
	40" - 98": 500cd/m²	28 - 44%		40" - 55" Landscape, Portrait, Face Up, Face Down	40" - 55" DP¹, HDMI, DVI-D, VGA, OPS Slot, Compute Module Slot
				65" - 98" Landscape, Portrait, Face Up	65" - 98" DP1, HDMI, OPS Slot, Compute Module Slot
P Series	40" - 55": 700cd/m²	28 - 44%	24/7	Landscape, Portrait, Face Up, Face Down	DP¹, HDMI, DVI-D, VGA, OPS Slot, Compute Module Slot
HB Series	2000 - 2700cd/m²	1 - 2%	24/7	Landscape, Portrait,	DP¹, HDMI, DVI-D, VGA, OPS Slot,

¹ DisplayPort

About NEC Display Solutions of America, Inc.

NEC Display Solutions of America, Inc., a leading designer and provider of innovative displays, offers the widest range of products on the market, such as commercial- and professional-grade large-screen LCD displays, desktop LCD monitors, direct view LED displays, a diverse line of multimedia and digital cinema projectors, and integrated display solutions. Benefitting from the technologies of NEC Corporation and its own Research and Development, NEC produces leading-edge visual technology and customer-focused solutions for a wide variety of markets, including education, retail, transportation, broadcast, enterprise, healthcare, houses of worship, and many more. NEC is orchestrating a brighter world with the quality and reliability of its products and outstanding customer service. For additional information about NEC Display Solutions of America products, call (866) NEC-MORE, or visit the website at www.necdisplay.com. Follow us on our social media channels: Facebook, YouTube, Google+, Twitter and LinkedIn.