

# White Paper

## Why Businesses should opt for the Barco UniSee LCD Video Wall Experience

### *Unique in the market*

- *A revolutionary bezel-less tiled LCD video wall platform*
- *Reliable installation, easy diagnostics and maintenance (zero-risk)*
- *Unique selling points of **Barco UniSee***



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## Trends of the LCD Video Wall Market

**The EMEA market is growing in 'mission-critical' applications. 55" is the most popular size and models with a bezel-to-bezel size of less than 3.5 mm are also seeing growth.**

► The use of LCD as indoor video wall technology is dominating the market and maintains its superiority over other technologies such as narrow pixel-pitch LED. However, LED technology will quickly become a real competitor as an indoor video wall solution because of a year on year price decrease trend.

**Narrow-bezel and NoGap technology for LCD video walls, are constantly developing** and are bringing some significant innovations to the market. The main dynamics influencing LCD video wall market trends are:

- the fact that the **55-inch** size has become the **most popular format**;
- increased **market share** of narrow-bezel models and bezel size trend going down;
- the **increased** use of LCD video wall solutions in a wide range of vertical applications such as **control rooms, broadcast backdrops, corporate lobbies, large meeting rooms, and boardrooms and public display systems**.

### **In 2017, 55-inch became the leading size, achieving growth of 10%**

Over the past years, video wall panel sizes moved from 46/49 inch towards 55 inch. Today, the 55 inch LCD panels are the most used size in the market.

**The market for narrow-bezel 55-inch LCDs is still growing annually with a growth rate of around 10%**, a rate that is expected to be maintained in the near future.

The reason for this is that the 55-inch size offers an excellent balance between various factors like product cost, visual quality and ease of installation and maintenance.

### **The market prefers LCDs with a narrow bezel less than 4 mm (bezel-to-bezel)**

The market for narrow-bezel LCD monitors is closely correlated with technological developments. In particular, the size of the bezel plays a fundamental role in the viewing experience and a high-quality immersive experience.

**Today, the market is still dominated by video wall solutions with a bezel-to-bezel dimension of approximately 3.5 mm** because these solutions offer the perfect compromise between cost and viewing quality.

**In the future, this situation might evolve to favor extremely narrow-bezel video walls**, although the size of the bezel is not the only feature required by the market. Alongside a slimmer bezel, **there is also an increased demand for products that are capable of withstanding mechanical stress without experiencing panel breakage**, something that occurs much more frequently than one might expect.

Another aspect that could influence the market is the degree to which a solution is seen as 'future-proof' and thus offering a more favorable TCO (total cost of ownership) and ROI.

### **The growth in the market for high value-added 'mission-critical' solutions**

As shown in the infographic to the side, the LCD video wall market is growing – a trend caused by the use of large value-added LCD video walls in 'mission-critical' vertical applications such as in Control Rooms and in the Broadcast industry.

Overall, the corporate market is likely to decline by a few percentage points between 2016 and 2021, mainly because here the required size is smaller, and one large display is often enough. But even here high-end LCD video wall solutions will maintain their position and may even buck the trend, experiencing growth.

To summarize, the key factors for generating value are:

- **focus on the higher end of the market;**
- **'tailor-made' value-added solutions;**
- **'mission-critical' vertical applications.**

### **The EMEA market is growing and competition comes from LED technology**

In terms of vertical application solutions, the EMEA market is expected to grow over the 2016–2021 period. In markets such as Control Rooms and Broadcast for example, the decisive factors will be:

- **long-term color uniformity;**
- **low viewing fatigue;**
- **high-quality viewing experience, even for those viewing from up close.**

The competition between narrow-bezel LCD video walls and narrow pixel-pitch LEDs is only just starting. Even though LED costs are falling and getting closer to those of LCDs, each technology has its specific features. Within the different vertical markets, both technologies can coexist because each offers its own specific advantages. As a result, any overlap will be limited and of relatively low significance.

*Barco UniSee® is revolutionizing the LCD video wall experience.*  
**Bezel-less design, unmatched uniformity at time of installation and over its service life thanks to real-time and continuous calibration, perfect alignment of the entire wall.**

▶ Until very recently, LCD video walls were composed of LCD tiles with disturbing bezels restricting the viewing experience. Misalignment of the panels and variations in color and brightness also impacted the viewing experience, preventing the image to come across as intended to. In addition, installation and maintenance could easily become a long-winded and complex process with a high risk of panel damage. **These weaknesses still exist in LCD video wall solutions from of all brands in the market except one: Barco UniSee®.**

**With its Barco UniSee® LCD video wall platform, Barco completely re-designed and reinvented each aspect of the LCD video wall**

These are the special features of Barco UniSee®:

- the bezel has been **removed**;
- the alignment of the panels is done with a high level of precision, as the **specialty designed mounting structure is self-aligning**, using the power of gravity, which also avoids the risk of damaging the panels during installation and maintenance;
- each panel's backlight service life is guaranteed for **100,000 hours in 24/7 operation**;
- the uniformity within each tile and across the entire video wall is **95%**, which is best in the market and significantly higher than the 77% offered by other available LCD video wall solutions;
- it is a modular platform which is future-proof and designed to evolve over time.

**Barco UniSee® – Areas of application**

The Barco UniSee® video wall has completely revolutionized the video wall market, offering unique benefits to both end-users and installers. The TCO (Total Cost of Ownership) is drastically reduced thanks to the re-designed backlight, which guarantees a service life of 100,000 hours, which is more than 20% better than the competition. Barco UniSee is fan-less, making it suited for noiseless applications whilst the absence of moving parts susceptible to wear and tear with a limited service life also improves the TCO. What's more, the modular design makes the entire platform future-proof as it can easily be extended to meet future needs.

Barco UniSee® can easily be integrated into the following settings and areas of application :

**Control and command rooms.** Key benefits here are the platform's superb reliability for 24/7 control room operations thanks to the remote and back-up power supply options; The bezel-less viewing experience of the detailed operational picture contributes to faster, more effective decision-making with fewer errors. Ergonomics are improved thanks to the fan-less design. Furthermore, Barco UniSee is suitable for any control room environment and lighting conditions, thanks to its 800 NIT high brightness and low reflection levels.

**Large meeting and board rooms**, where senior corporate leaders can welcome visitors and guests both in face-to-face meetings or video conferences. The uninterrupted visual experience offered by Barco UniSee®, combined with the fact that multiple content sources can be displayed simultaneously on a large display wall, brings greater efficiency to management meetings.

**Corporate lobbies, experience centers.** With Barco UniSee®, companies can capture their customers' attention from the moment they enter the lobby, making it a more pleasant place for visitors to wait. Barco UniSee®, also helps managers to boost their corporate branding and offer compelling content to improve users' visual involvement in facilities such as experience centers.

**Broadcast studios.** Large-scale video walls have become key elements as backdrops of state-of-the-art TV studios, particularly for dedicated news and sports channels. Creating an immersive atmosphere gives a greater sense of involvement for viewers and redefines storytelling.

**Other settings/areas of application** where image quality, flexibility, simplicity, or reduced viewing distance are essential factors.

*Barco's headquarters is situated in **Kortrijk, Belgium***



*Barco UniSee facilitates **diagnostics and maintenance**, thereby minimizing any downtime*



## Barco UniSee®, Why?

Barco UniSee® offers superior features compared to the offerings available today from competitors. Here are some of its main advantages:

**NoGap technology:** the inter-tile gap is barely noticeable and is the lowest available in the market, which finally makes it possible to spread content over multiple tiles without the interruption of a disturbing bezel. Even when watching the LCD video wall from up close, you enjoy a vivid and uninterrupted viewing experience.

**Unmatched uniformity both intra- and inter-tile,** equivalent to 95%, which is a significant figure when compared to the best competitor systems currently available with only achieve 77%. Displaying images at such consistent levels of brightness enhances the user experience of LCD video walls.

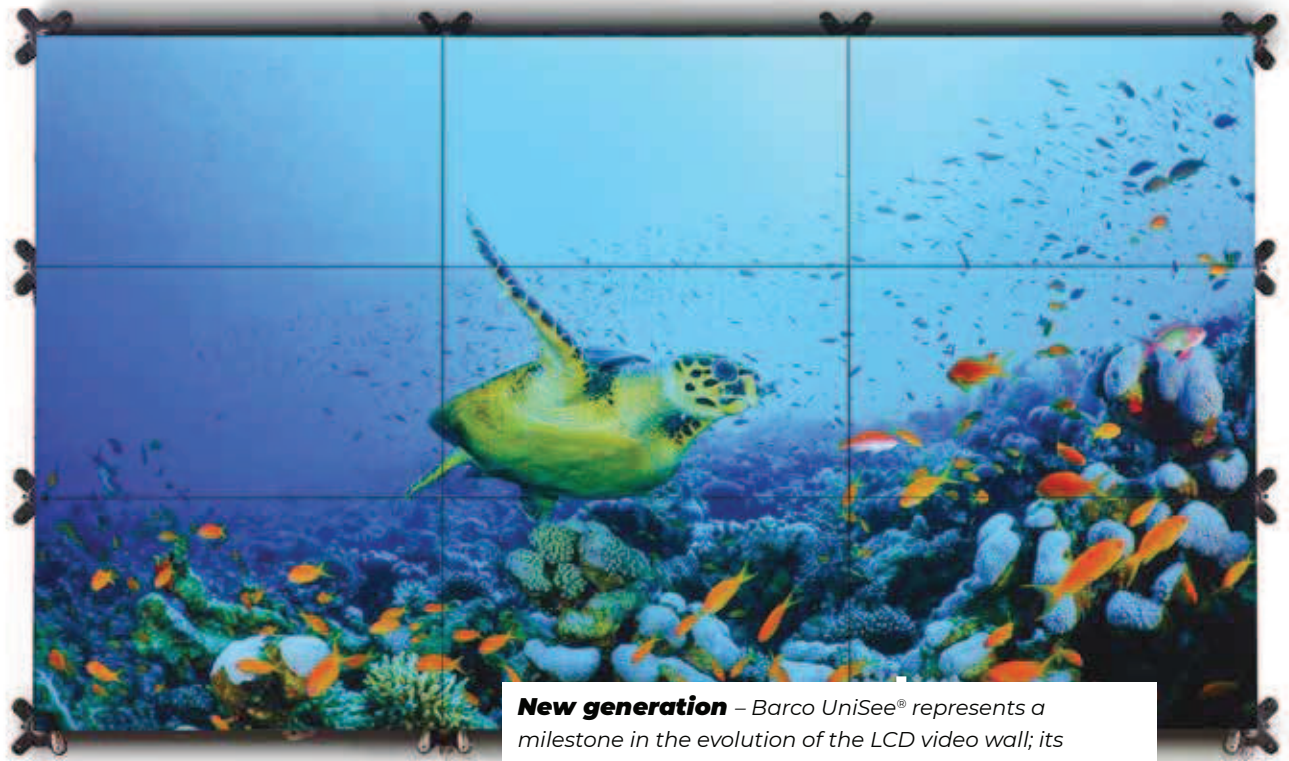
**Brightness of 800 Nits,** without compromising the 100,000-hour service life of the backlight (24/7 operation for more than 11 years).

This long lifetime represents another record, being 66% better than any other LCD available on the market.

**Fan-less design,** meaning no disturbing noise and offering the best ergonomic conditions. Barco UniSee® is also convenient in small to medium-sized indoor environments, even when users are located close to the video wall.

## BARCO UNISEE®: THE BENEFITS FOR THE END USER

- **Groundbreaking bezel-less viewing experience:** with a barely noticeable inter-tile gap between the panels
- **A perfectly balanced image at all times:** the Sense X technology constantly calibrates color and brightness, in real time;
- **Backlight technology with a lifetime of 100,000 hours,** drastically improving return on investment
- **Operational continuity:** can be used 24/7 with greater reliability thanks to remote and back-up power supplies (internal or external)
- **Fan-less design,** making it completely noiseless even when viewed up close
- **Self-aligning mounting frame:** keeps every panel perfectly aligned over time without damaging the panel's edges during installation
- **Modular design** making the platform future-proof and easy to expand



**New generation** – Barco UniSee® represents a milestone in the evolution of the LCD video wall; its competitive advantages are clearly visible to all

*Barco UniSee®*, revolutionary in terms of installation and maintenance - **The risk of panel damage is dramatically reduced, along with the needed installation time; each panel is perfectly aligned automatically, simply by the power of gravity.**

► Barco has revolutionized the architecture of traditional LCD video walls. It has done this by redesigning every component, creating an LCD video platform that consists of three modules:

- **UniSee View**, the LCD panel;
- **UniSee Mount**, the mechanical mounting frame;
- **UniSee Connect**, which includes the panel's electronic controls, the management of the IN/OUT signals, and running the Sense X calibration technology.

This revolutionary platform is the result of a five-year R&D process, involving the development of a number of patented technologies.



**UniSee Mount, the mounting frame**

When assembling a video wall (or replacing a panel), the installer is faced with a significant problem: how to prevent the panels from touching each other and therefore how to avoid damage. This occurs frequently, particularly with narrow-bezel LCD panels. This is because the mounting frame is not fit for purpose.

With UniSee Mount, Barco has reinvented the mounting frame, removing the likelihood of panel damage and dramatically reducing the working time required for installation.

Barco UniSee's competitive advantages:

1. automatic creation of a **3-centimeter gap** around each panel during installation or maintenance, **preventing the panels from touching each other** and getting damaged;
2. **automatic alignment** of the panels, using the power of gravity
3. the ability to configure a video wall up to **10 rows** high in landscape and **6 rows** in portrait.

**BARCO UNISEE®: BENEFITS FOR THE INSTALLER AND MAINTENANCE ENGINEER**

1. **Sense X: continuous calibration** in real time for a perfectly balanced image;
2. **Self-aligning installation** that is quick, safe and risk-free;
3. **Easy access:** a 3-cm space can be created around each panel;
4. **Simpler maintenance:** the Barco UniSee® video wall is completely modular and designed to adapt to future needs;
5. **Fan-less design**, making it completely silent;
6. **Operational continuity:** improved reliability with remote and back-up power supply options (internal or external);
7. **Simplified diagnostics**, with a straightforward connection to the AV controller and open-source control software

**3-centimeter maintenance gap**

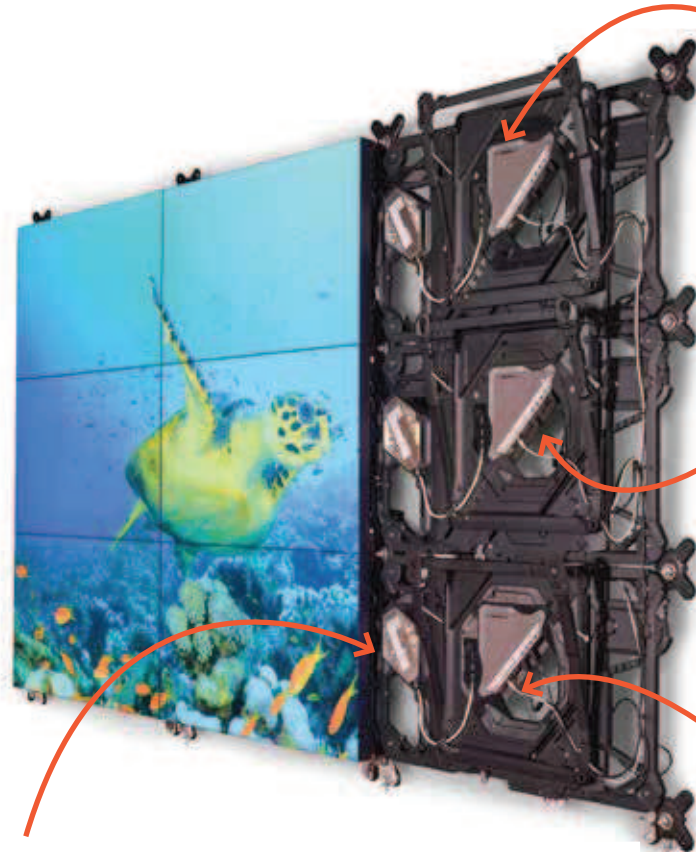
To the right, the manual operation required to create a space around each module, preventing impacts and damage. Below, an illustration of the way the panels move to create the space required





### Edge protection

The angular structure designed to prevent the edges of the panels from making physical contact with each other



**Power supply module, linked to the UniSee® View panel by a dedicated connector.** Two significant benefits: there is space provided for a built-in back-up power supply module and there is an option to select a remote low-voltage power supply up to 100 meters from the panel itself (for example, located in a building services room)

**IN/OUT module**, which can be connected and disconnected from the UniSee® View panel by removing it from its housing without dismantling the video wall, enabling the module to be replaced in the event of failure or upgraded to new standards or formats.

**Loop-through HDMI and DisplayPort connections;** in combination with the Barco NGP-400, ECU-110, and ECU-200 graphics controllers, these support a resolution of 4K x 2K (QHD).

**Option of connecting all the LCD panels to a single** processing unit via a private LAN, for remote web-based control, allowing for adjustment, monitoring and diagnostics for either each individual LCD panel or the entire video wall.

### SENSE X: THE REAL-TIME AND AUTOMATIC CALIBRATION SOFTWARE

'Sense X' is the latest version of Barco's automatic – and even remote – color and brightness calibration solution introduced over a decade ago.

The entire calibration process is performed in the **background** and never interferes with the image displayed. The **two active optical sensors** built inside each LCD panel continuously **measure, in real-time, the brightness and color** levels; the four photosensitive measurements for each panel provide constant information on the white point and gray scale levels for each LCD tile. The measurements are communicated in real time to UniSee Connect, specifying the ideal working point and transferring to individual panels the information needed to set the common working point for the entire video wall.



### UniSee® View, the LCD panel

Unlike other LCD video wall units, UniSee View does not have built-in electronics for controlling the system. It offers many unique features. Here are some of the main ones:

- **55" size, 1,920 x 1,080 resolution;**
- **the panel is bezel-less:** the gap between two adjacent tiles is almost invisible, even when viewed from up close;
- **95% uniformity of brightness** (the best competitor system achieves only 77%);
- **guaranteed true brightness of 800 cd/m<sup>2</sup>;**
- **the backlight has a service life of 100,000-hours,** 66% longer than any other LCD on the market;
- **there are no cooling fans,** so there is no disturbing noise;
- **the panel weighs only 15 kg,** allowing for easy handling and faster and safer installation.

### UniSee Connect the control system

The electronics for controlling and monitoring the Barco UniSee® video wall are part of the UniSee Connect box, designed for managing the entire video wall

*Barco UniSee®*, a project designed from scratch

**Pietro Capretta, Product Manager for Barco UniSee®:**

**"The very best thing? The fact that we've developed the perfect product, starting from a blank sheet of paper."**

▶ Barco is known for the state-of-the-art quality of its products, providing cutting-edge performance at the top end of the market, in every sense, including:

- seamless product operation;
- high added-value after-sales support;
- absolute reliability.

To guarantee all this, Barco has incorporated into its organizational structure a dedicated internal **research and development center, which is very rare in the industry**: a team of engineers working on **long-term, 5 to 10-year projects**. This is a significant investment if we consider that only 10% of these projects will lead to new products that will be put into production and launched onto the market.

**When Barco started working on the Barco UniSee® project, it had already developed 'NoGap' technology to reduce video wall gaps to only 1 mm**

"The Barco UniSee® project was launched five years ago," Pietro Capretta recalls. "Back then, the working group had already developed a technology capable of producing panels with a bezel of less than 2 mm, even though at that time there were video walls with 7 mm bezels on the market. **For Barco, our aim was to become the first manufacturer of 55" LCD modules with no bezel.** The Barco UniSee® project is characterized by its innovative approach: before starting the design process, we held a number of workshops to understand the issues with the LCD video walls currently available on the market and to identify all of the problems that our company, installers and service engineers had encountered up to that point."

**A blank sheet of paper for creating the perfect video wall screen that could revolutionize the user experience and satisfy everyone's requirements**

"**We began by thinking things through from scratch**", continues Pietro Capretta, "as if we were faced with a blank sheet of paper on which to write anything that we could do. We ranked by importance all of the ideas that came out of the various meetings attended by different representatives from product management to R&D, from sales to logistics and servicing. This phase

of the project was really crucial: **once the workshops were over, we had several revolutionary ideas in mind that would later become reality. Ideas that were totally innovative in the market back then**, a market that was already strong and established. Coming up with something new was not an easy task to accomplish."

**Barco UniSee® revolutionizes all aspects of an LCD video wall by breaking it down into different modules. In the LCD video walls of competitors, the panel, electronics and power supply form a single unit.**

Moving video wall panels is a critical activity which installers and service engineers are very familiar with. As the risk of panel damage is high, it makes sense to always leave a small gap between two adjacent tiles to prevent them from touching each other. Breakage rates potentially reach 10-15% of units produced.

"With a 'bezel-less' screen, which was our target," Pietro Capretta adds, "the idea of leaving a small safety gap for the installation process was not an option as it would have spoiled the final result. Therefore **we decided to redesign the entire architecture of the LCD video wall, separating out certain parts.**"

Barco UniSee® is composed of three different modules: the LCD panel, the self-aligning mounting frame and the electronics with the IN/OUT interfaces



*Barco UniSee® can be installed on a wall or, as in the photograph, on a **floor stand***

**PIETRO CAPRETTA  
ELECTRONIC ENGINEER  
PRODUCT MANAGER AT BARCO UNISEE**

*Pietro Capretta, born in Valdobbiadene, north-east Italy, holds a degree in Telecommunications Engineering from the University of Padua. He began his career at Alcatel and STMicroelectronics in the cellular telephony microchips sector, first as a designer and then as a product manager working with Bluetooth, GPS, and Wi-Fi technologies. Since 2013, Capretta has held the role of Project Manager at Barco, focusing on LCD technologies for video wall applications, being part of the team that designed and developed the Barco UniSee platform. His main task was to translate the market's requirements into a product that resolves most of the issues associated with this type of technology.*

**"We developed a special mounting frame",** Capretta continues, **"that protects the LCD panel, which is the most expensive component and the one which is most likely to break.** The installer first sets up the frame, aligns and locks it; then the electronic and power modules are wired up and the IN/OUT cables are connected. Finally, each panel is docked to the structure, starting from the first row at the bottom and moving up to the top, making use of two magnetic contact points."

This way of working avoids any potential damage to the panels and saves installation time. Moreover, **the ability to move each column and row of screens, by manually operating a knob located in the lower part of the frame, creates a safety gap around each panel that prevents it from coming into contact with the adjacent one during servicing.** After positioning all of the tiles, columns and rows of screens that make up the video wall, each LCD panel is moved back into place by gravity. Every LCD panel has four special corners that

connect to one another, while the mounting frame keeps the gap between each tile as small as possible at all times.

**The response from the market has been exciting.**

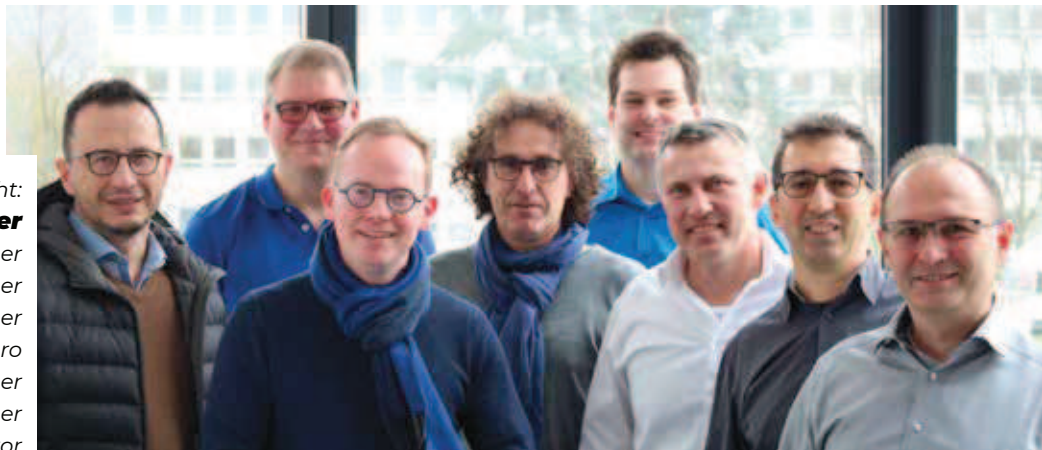
Barco UniSee® was launched globally on 24th October 2017 with dedicated simultaneous events in Europe (at Barco's headquarters in Kortrijk, Belgium), the United States and China. **The enthusiasm of the market has been and continues to be overwhelmingly positive.** In particular, there is a recognition that Barco UniSee® embodies the unusual level of attention paid to the aspects that really matter. "We were able to think through the product and create it in the way we wanted it", Pietro Capretta concludes, "and we put everything in place to ensure our ideas were convincing: it wasn't an easy process but after seeing the results, our efforts have definitely paid off."



**Market-leading 95% uniform brightness, a patented solution. This represents a massive improvement on the next-best solution on the market, which achieves only 77%.**

The UniSee View backlight is generated by a matrix of LEDs, ensuring there are no shadow zones around the edges of the screen.

**"We have developed a technology, protected by multiple patents, for backlighting 100% of the pixels in a uniform way by using a greater number of LEDs than our competitors,"** Pietro Capretta explains, "What's more, we are powering our LEDs with a lower current, allowing us to guarantee up to 100,000 hours of operation. This contrasts with what happens in our competitors' panels, where the LEDs are over-powered and get worn out more quickly."



*From left to right:*

- Pietro Capretta, Product Manager**
- Thomas Weber, Optical Engineer*
- Tom Dewaele, Design Manager*
- George Gimbler, Mechanical Engineer*
- Sven Schuele, Project Leader, Marcos Otero*
- Gensheiler, HW Project Manager*
- Roland Schmuker, Mechanical Project Manager*
- Soeren Dambach, R&D Director*



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