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**The need for flexible display solutions
to meet the request for a constantly changing control room**



Agenda

- Large Display Market Trends within the Control Room Space
- LED solutions for Control Rooms
- SMD LED vs MicroLED
- The Wall – a Game Changer

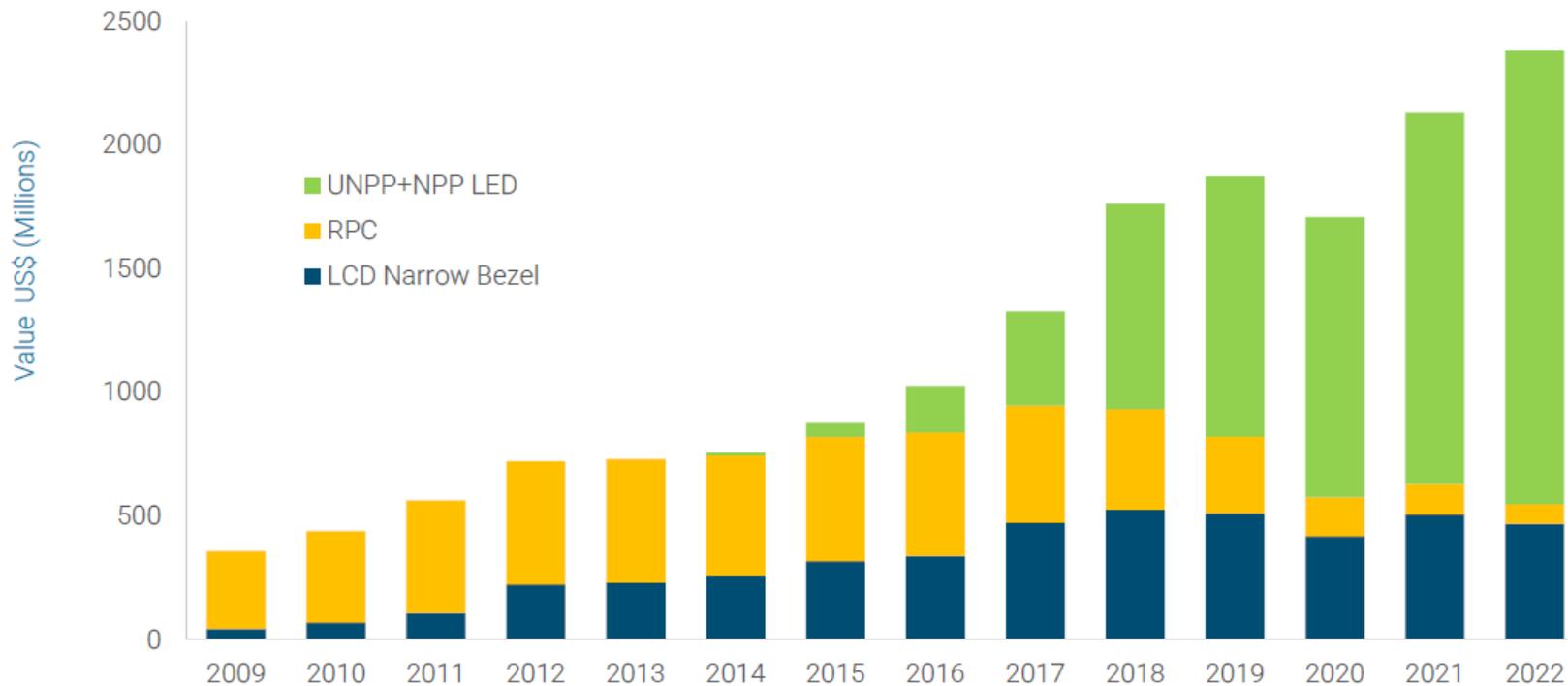


Large Display Market Trends

CONTROL ROOM

NPP LED In Control Rooms Maintains Growth While RPC and LCD Decline

Control Room Video Wall Value (US \$) Performance 2009-2022



77%
of All Value
was NPP LED
in 2022

Main display's in a Control Room

- (Rear Projection Cubes)
- LCD video wall
- SMD LED
- MicroLED

Operator desk

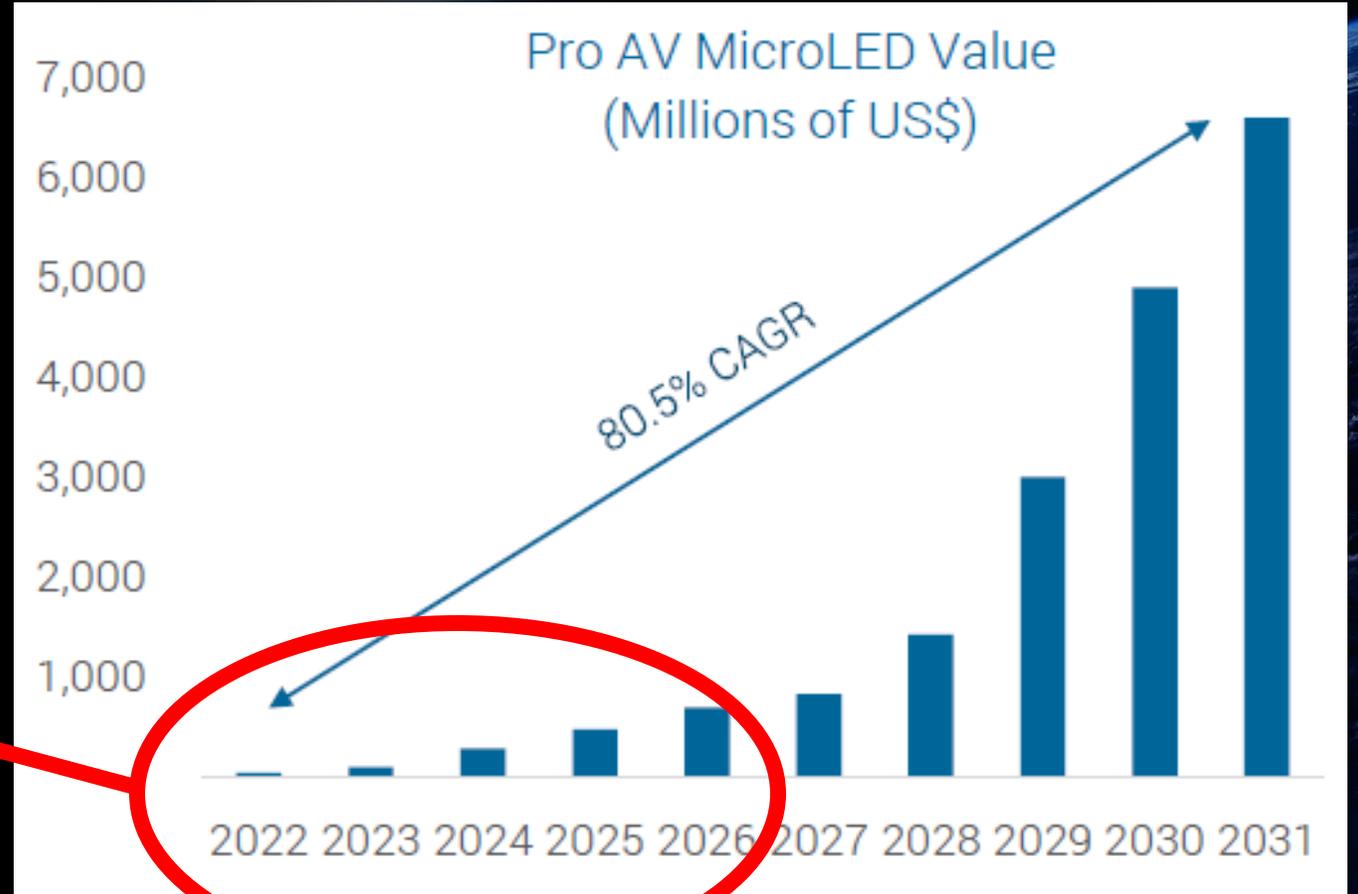
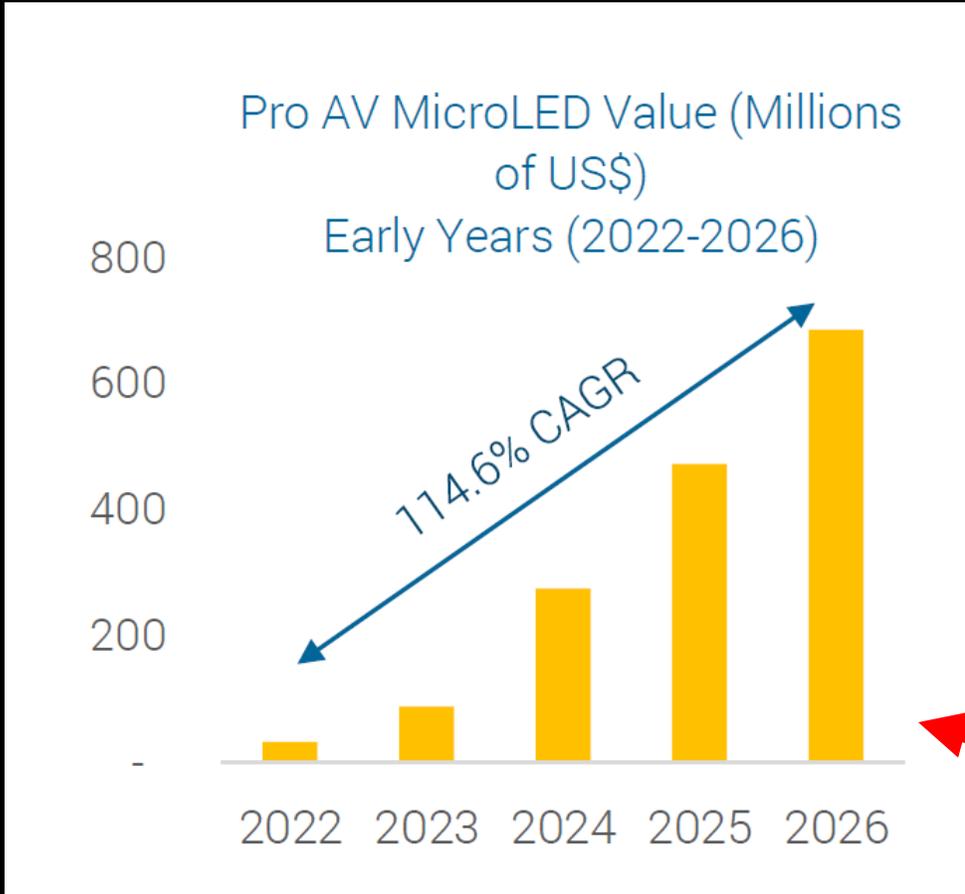
- Flat desktop monitors (LCD)
- Curved desktop monitors (LCD)

New technology shifts preferred solutions



	LCD	OLED	SMD LED	MiniLED	MicroLED*
Display Type	Colour filter with backlight	Self emissive			
Driving Technology	Active		Passive		Active
Diagonal Size Limitations	80" panel / unlimited tiling with bezel	≤80" panel	≥100" panel / Unlimited seamless tiling		
Pixel Size (microns)	≥32	≥18	≥200	101-200	≤100
Max Colour Space	Rec. 709	≤ DCI P3	DCI P3		
Brightness (nits)	≤700		≤2,000	≤1,200	≤1,000
Contrast Ratio	5,000:1	≥100,000:1	5,000:1	≥10,000:1	≥100,000:1
Max Viewing Angle (degrees)	89		160		180
Refresh Rate (Hz)	120			240	
Response Time (seconds)	Ms	μs			Ns
Lifespan (hours)	30,000-60,000	10,000	100,000		150,000
Acquisition Cost	Low	Low-medium	High	High	High -> low (expected)
Operating Cost	Medium	Medium	High	High	Medium -> low (expected)

MicroLED is a developing technology and specifications are only estimated and thus delineated with a "*".



Source: futuresource

4 LED line up for Control Room

1.
Core SMD LED
"Alternative to Video
Walls"



✓ 43" module
1,26 pp

2.
The Wall
"IWA 36.4"
MicroLED



✓ 36.4" module
0.84 pp
1.26 pp
1.68 pp

3.
The Wall
"IWB 55"
MicroLED



✓ 55" module
0.63 pp
0,94 pp

4.
IAB
"All in One"
MicroLED



✓ 110" All-in-one FHD
✓ 146" All-in-one FHD & UHD

Direct View SMD LED

Taking a panoramic view of the situation

Large-scale indoor LED display options from Samsung provide a perfect view of critical information and guaranteed performance to keep the control room operational at all times.

SMD LED



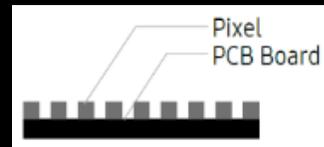
The Wall MicroLED

Unmatched image detail and contrast that's built to last

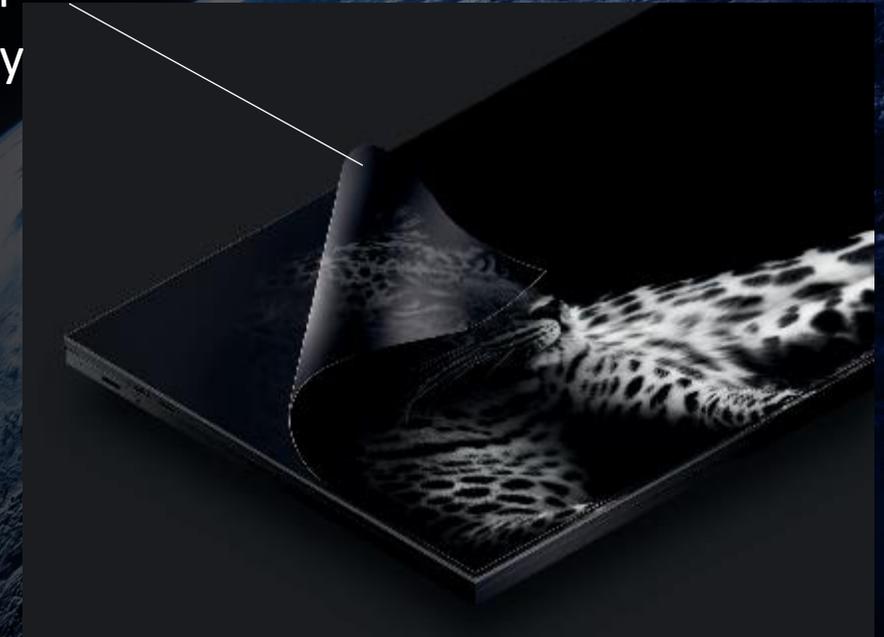
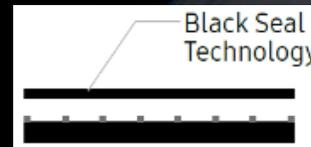
The Wall is the ultimate centerpiece of any control room, offering industry leading picture quality and long-lasting quality to meet the demands of any control room environment.

Black Seal Technology

Conventional LED

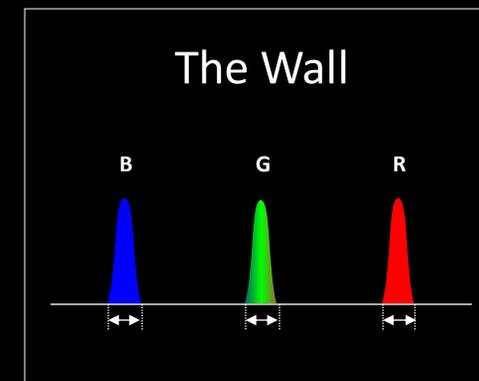
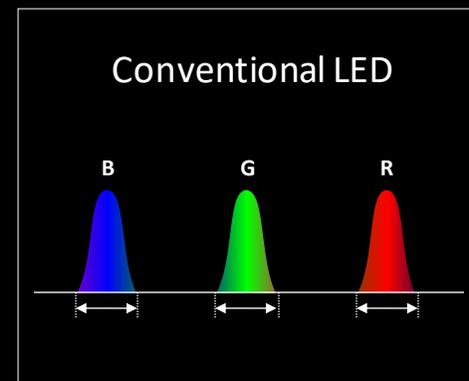


The Wall



Ultra Chroma Technology

Colours leap to life with spectacular vibrancy to recreate scenes as if you were there in real life. Narrower wavelengths produce RGB colours two times purer and more accurate than conventional LEDs.

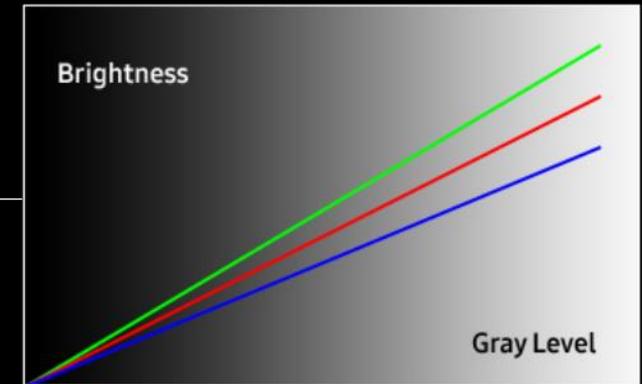
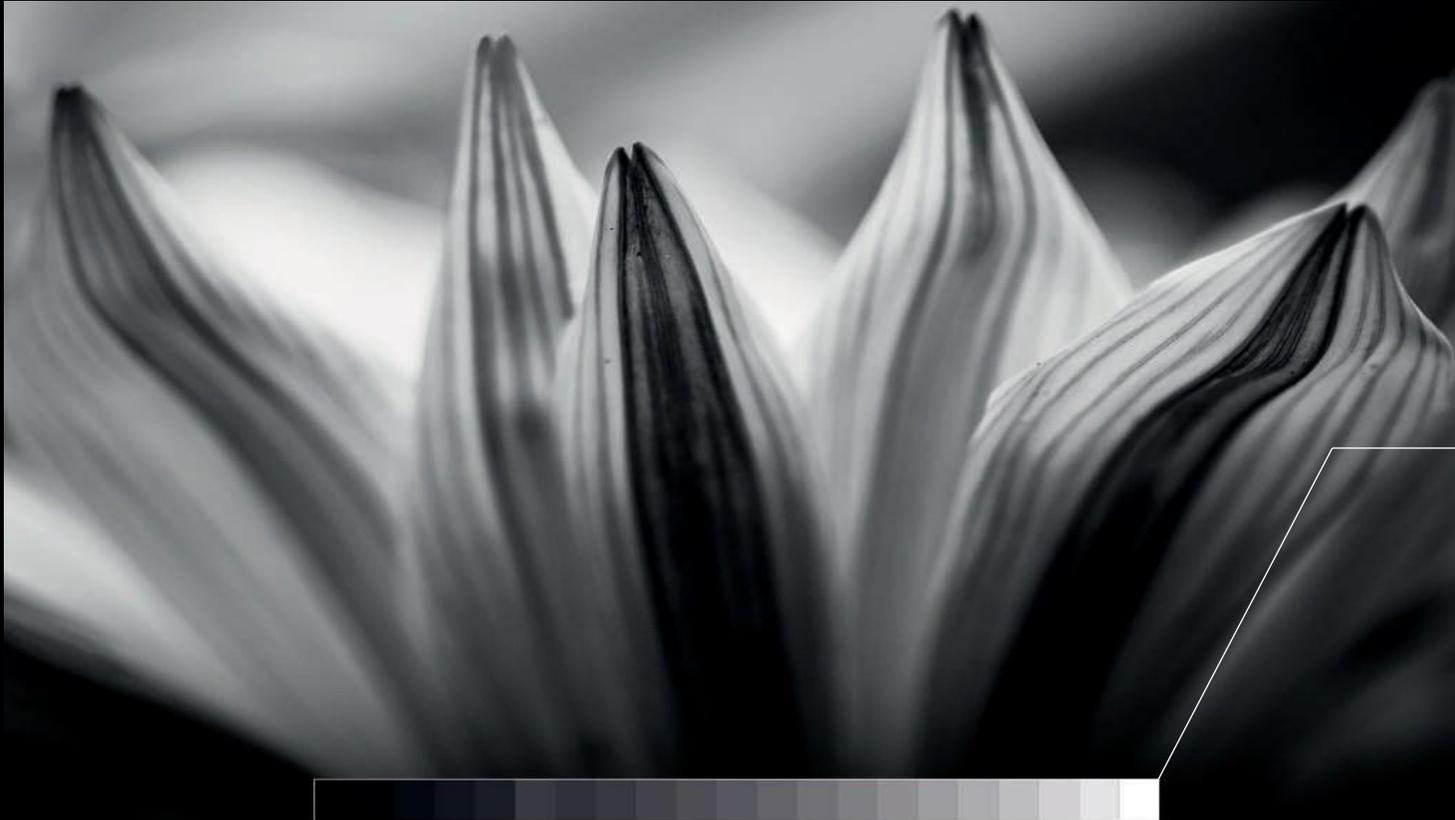


2x Narrower*

*Figure is based on internal testing standards against Samsung's conventional LED Signage.

Linear Grayscale

A precise linear grayscale showcases intricacies in every scene, naturally delivering textures, volume and shades. The elevated continuity pulls you further into your content for unbroken immersion.



Continuous Grayscale
Removing Colour Shift

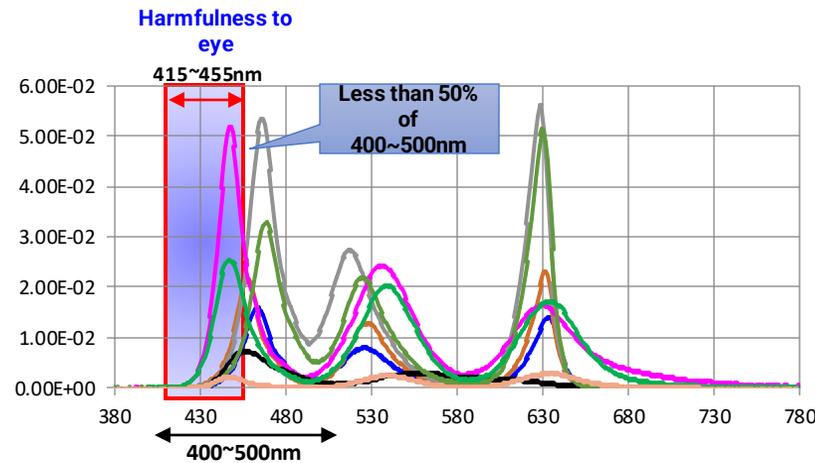
TUV Certification



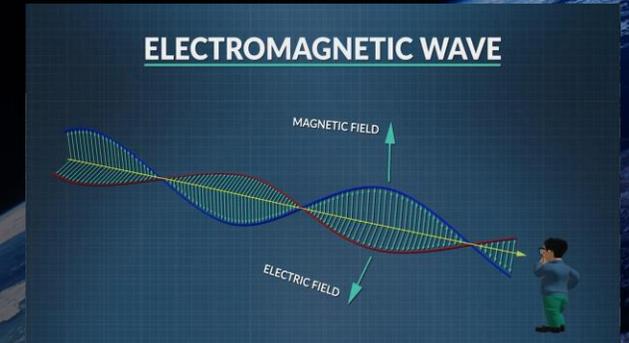
Eye safe certification to protect users from harmful blue light

Eye-safe

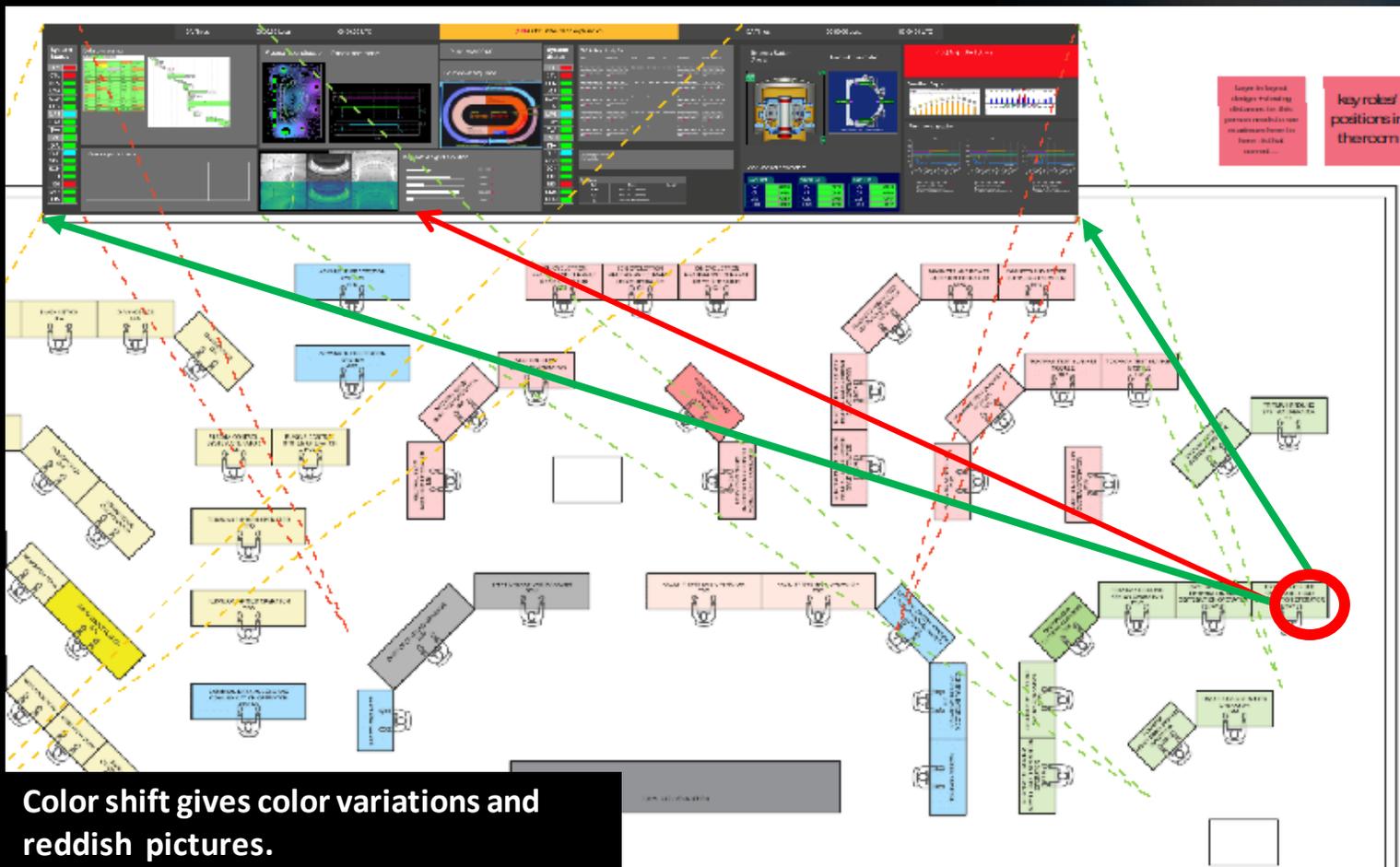
Minimize damage to eyes through Low-Blue light emission



EMC Class B



Ensures user safety, minimizing electromagnetic waves in addition to the protection of the surrounding working environment

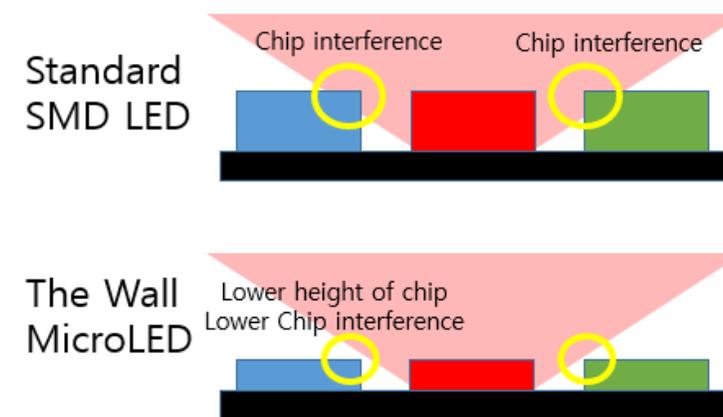


Color shift gives color variations and reddish pictures.

	Standard SMD LED	The Wall
Horizontal	120°	170°*
Vertical	120°	156°*

Wider Viewing Angle & Less color shift

The Wall uses shorter LED chips to improve viewing angle





The Wall is the new game changer in Control Room display

- Module-based - any size and shape
- No bezel
- COB MicroLED with black surface (unique to Samsung)
- Comes in 0,63/0,84/0,94/1,26/1,68 mm pixel pitch
- Noise free – no fans
- Little space required only 58,3 mm
- Redundant signal and power
- Remote power option
- Extremely long lifetime – up to 150.000h
- Very low maintenance cost
- 30% power reduction. vs SMD
- Operator safety
- U.S. Trade Agreements Act (TAA) compliant

Thank you

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