

BRIGHTLUX

Pixel Pitch Guide

Specification Guide for LED Display Resolution & Viewing Distance

A practical reference for architects, consultants, and AV designers to correctly specify pixel pitch based on viewing distance, content type, and application requirements.

WHAT IS PIXEL PITCH?

Pixel pitch is the distance (in millimeters) between the center of one LED pixel and the center of the adjacent pixel. It is the single most important specification that determines image resolution, optimal viewing distance, and cost.

- Smaller pixel pitch = higher resolution = closer viewing distance = higher cost
- Larger pixel pitch = lower resolution = farther viewing distance = lower cost
- Over-specifying pitch wastes budget; under-specifying creates visible pixelation

THE VIEWING DISTANCE FORMULA

Minimum Viewing Distance (metres) = Pixel Pitch (mm) x 1.5

Comfortable Viewing Distance (metres) = Pixel Pitch (mm) x 2.5

For content with fine text or detail, use the minimum. For video/graphics content viewed casually, the comfortable distance applies.

PIXEL PITCH BY APPLICATION

Application	Typical Distance	Pitch Range	Resolution Need
Control/Command Room	1-3m	P0.7 - P1.2	Ultra-high (data/text)
Executive Boardroom	2-4m	P0.9 - P1.5	Very high (presentations)
Retail Close-up Display	1-3m	P0.9 - P1.5	Very high (product detail)
Hotel/Corp Lobby	3-8m	P1.5 - P2.5	High (branding/video)
Conference/Ballroom	5-12m	P2.5 - P3.9	Medium (presentation)
Mall Atrium/Signage	5-15m	P2.5 - P4	Medium (video/promo)
Outdoor Street Level	5-20m	P3.9 - P6	Standard (video)
Highway Billboard	20-80m	P6 - P10	Basic (large graphics)
Stadium Perimeter	30-100m	P8 - P16	Basic (scores/video)

RESOLUTION CALCULATOR

To calculate the resolution of your LED wall:

Horizontal Pixels = Screen Width (mm) / Pixel Pitch (mm)

Vertical Pixels = Screen Height (mm) / Pixel Pitch (mm)

Example: A 4m wide x 2.25m tall wall at P1.5:

- Horizontal: 4000mm / 1.5mm = 2,667 pixels
- Vertical: 2250mm / 1.5mm = 1,500 pixels
- Total resolution: 2667 x 1500 = 4 million pixels (approx. 4K)

CONTENT TYPE CONSIDERATIONS

Content Type	Min Resolution	Pitch Guidance
Text-heavy (data dashboards)	Full HD (1920x1080)	Use pitch formula strictly
Video playback	720p acceptable	Can use larger pitch
Mixed (presentations)	Full HD recommended	Use pitch formula
Medical/technical imaging	4K+ preferred	Smallest pitch in budget
Architectural/branding	720p-1080p	Prioritise size over resolution

COST vs PITCH TRADE-OFF

Approximate cost relationship (2026 market):

Pixel Pitch	Cost/sqm (USD)	Typical Technology
P0.7	\$12,000 - \$20,000	COB / MiP
P0.9	\$8,000 - \$14,000	COB / MiP
P1.2	\$4,000 - \$8,000	COB / MiP / SMD
P1.5	\$2,500 - \$5,000	MiP / SMD
P2.5	\$1,200 - \$2,500	SMD
P3.9	\$800 - \$1,800	SMD
P4-P6	\$600 - \$1,500	SMD (outdoor)
P8-P10	\$400 - \$900	SMD (outdoor)

BRIGHTLUX | Premium LED Display Solutions

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