



When selecting a Direct View LED video wall, the most fundamental decision to make is what pixel pitch to choose. *Pixel pitch*, or *pitch*, is the millimeter measurement of space between the centers of LED pixels in the video wall. A video wall with 2 millimeter (2mm) pitch has 2mm distance between any two adjacent pixels.

Pixel pitch directly determines *pixel density*—the number of pixels in a given screen area—and pixel density directly determines *recommended viewing distance*—the distance away from the video wall a viewer should be to have a satisfactory viewing experience. The finer, or smaller, the pitch, the closer the acceptable viewing distance. The larger the pitch, the further away a viewer should be.

Fine pitch LED video walls are considered to be within the range from 0.6mm to approximately 2.5mm with anything with larger pitch being considered *Standard pitch*. Pitch also directly influences cost. As pixel pitches and viewing distances decrease, pixel density and costs increase. For the best value, it's important to know the average viewing distance for the primary application, then select the video wall display with a pitch that suites it best.

Viewing Distance Calculation

Acceptable viewing distance is subjective; it's whatever a viewer perceives to be acceptable. There are, however, methodologies to determine acceptable viewing distance in a more objective way:

Visual Acuity Distance

Visual Acuity Distance (sometimes referred to as “Retina Distance”) is a formulated calculation of the distance a person with 20/20 vision must move away from an LED video wall to no longer distinguish individual pixels.

Visual Acuity Distance Formula

$$\begin{array}{ccccc} \boxed{2.50} & \times & \boxed{3438} & = & \boxed{28.1} \\ \text{Pixel Pitch in mm} & & \text{3438 Scale Factor of 1 arc minute (20/20 vision)} & & \text{Visual Acuity Distance converted to ft from mm} \end{array}$$

10x Rule

The 10x Rule is a shorthand method for quickly calculating an approximate estimate of the Visual Acuity Distance.

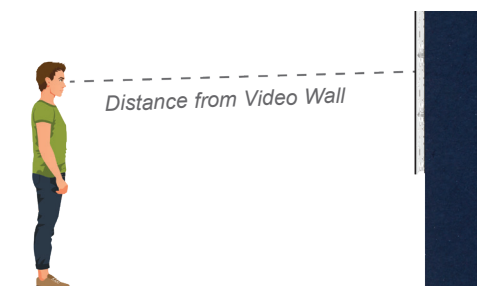
10x Rule Formula

$$\begin{array}{ccccc} \boxed{2.50} & \times & \boxed{10} & = & \boxed{25.0} \\ \text{Pixel Pitch in mm} & & \text{10x multiplier} & & \text{Approx. Viewing Distance in ft} \end{array}$$

Average Comfortable Viewing Distance

The Average Comfortable Viewing Distance is the estimated viewing distance that most people will find the video wall's appearance acceptable. This estimation is based on a large number of real world installations.

Average Comfortable Viewing Distance is subjective and can be impacted by a number of variables including the viewer's eyesight, type of application, content resolution and type (e.g. video vs spreadsheet).



Viewing Distance Chart

This Viewing Distance Chart lists the calculations for Visual Acuity Distance and Average Comfortable Viewing Distance related to pixel pitches from 0.6mm to 10mm.

Pixel Pitch (millimeters)	Visual Acuity Distance (feet / inches meters)	Average Comfortable Viewing Distance (feet / inches meters)
0.6mm	6ft 8in 2.07m	3ft 4in 1.03m
0.7mm	7ft 9in 2.40m	3ft 9in 1.20m
0.9mm	10ft 1in 3.09m	5ft 1in 1.50m
1.00mm	11ft 3in 3.44m	5ft 8in 1.72m
1.25mm	14ft 1in 4.30m	7ft 1in 2.15m
1.50mm	16ft 11in 5.16m	8ft 6in 2.58m
1.75mm	19ft 9in 6.02m	9ft 11in 3.01m
2.00mm	22ft 7in 6.88m	11ft 3in 3.44m
2.25mm	25ft 5in 7.74m	12ft 8in 3.87m
2.50mm	28ft 2in 8.60m	14ft 1in 4.30m
2.75mm	31ft 0in 9.45m	15ft 6in 4.73m
3.00mm	33ft 10in 10.31m	16ft 11in 5.16m
4.00mm	45ft 1in 13.75m	22ft 7in 6.88m
5.00mm	56ft 5in 17.19m	28ft 3in 8.60m
6.00mm	67ft 8in 20.63m	33ft 10in 10.31m
7.00mm	78ft 11in 24.07m	39ft 6in 12.03m
8.00mm	90ft 3in 27.50m	45ft 1in 13.75m
9.00mm	101ft 6in 30.94m	50ft 9in 15.47m
10.00mm	112ft 10in 34.38m	56ft 5in 17.19m