

Christie[®] MicroTiles[™]

Technical Frequently Asked Questions (FAQs)

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FAQs

1 Size and physical installation

1.1 How many tiles will I need to fit a physical space?

Simply visit www.microtiles.com and enter the physical dimensions of your space in the online calculator. Alternatively, you can download and use the Christie MicroTiles Designer software to determine how many tiles you need.

1.2 What is the maximum size of a Christie MicroTiles display?

Up to 1024 tiles can be connected together and function as a single display. It is possible to build an even larger display, but each section of up to 1024 tiles must be controlled and calibrated by a separate group of ECUs.

1.3 How much room should I leave around the tiles?

A minimum gap of 50mm (2") is required behind the tiles for air flow and cabling. However, in order to ensure that the air behind each tile is within the operating range of 5-40°C (41-104°F), large displays may require additional space.

1.4 Do Christie MicroTiles require any additional mounting support?

Each tile contains a sturdy metal housing that allows you to build standalone displays up to five tiles high, as long as the display is adequately ballasted and secured to prevent tipping.

As a general rule of thumb, the weight of each tile above five high must be transferred to a separate supporting structure. Christie offers a bracket which attaches to the rear of the tile, enabling it to be mounted to a superstructure.

For more information on how to install and mount Christie MicroTiles, refer to the User Guide available at www.microtiles.com

1.5 Can you suspend or fly Christie MicroTiles from rigging?

Yes. In this situation, a bracket should be used on every tile.

1.6 Can Christie MicroTiles be mounted at an angle, in the floor or on a ceiling?

Christie MicroTiles can be mounted in a variety of orientations, but there are some limitations.

Angle-mounting: Brackets can be installed on each tile to allow angle-mounting. Up to 20° from vertical is supported at this time.

Floor-mounting (facing up): This is supported; however, the tiles cannot bear weight in this orientation.

Ceiling-mounting (facing down): Not supported at this time.

1.7 Can Christie MicroTiles be mounted in portrait orientation?

Yes. Christie MicroTiles utilize solid state technology, so they can be rotated at any angle, including both landscape and portrait orientation. However, the mechanical assembly and alignment features of Christie MicroTiles, as well as the optional mounting bracket, have been optimized for landscape orientation.

1.8 Can Christie MicroTiles be used to create curved displays?

Yes. Christie MicroTiles, due to their small form factor, are ideal for creating a faceted curved display, such as those common in architectural and monitoring applications. Tiles may be curved in either landscape or portrait configuration. If screen gaps need to be maintained then only a concave shape is possible (curving inwards), not convex, and a single wall may only be curved in one direction. For vertical curves, please note that angle-mounting is supported up to 20° from vertical at this time.

If the angle of curve between two tiles exceeds 5°, the infrared (IR) transmitter and receiver in neighboring tiles will not “see” each other. Affected tiles will need to be manually mapped during initial setup, so that the system is aware of their physical location in the overall canvas. This is a simple, one-time process, but may be time-consuming on a large display. Please note that all other functionality of the tiles, including color and brightness matching, occurs through the DisplayPort cabling, and is completely independent of the IR neighbor detection scheme.

2 Resolution and playback

2.1 What is the resolution of Christie MicroTiles?

With Christie MicroTiles, you can achieve practically any resolution simply by adjusting the number of ECUs connected to the tiles. The more ECUs in the system, the greater your displayed resolution can be, up to a maximum of 720 x 540 pixels per tile (native resolution).

The following table shows the maximum displayed resolution that can be achieved with some example display sizes.

Example displays:		81 tiles (9 wide x 9 high) 10.1 sq. m. (108.9 sq. ft) 4:3 aspect ratio			48 tiles (8 wide x 6 high) 6.0 sq. m. (64.5 sq. ft) 16:9 aspect ratio		
ECUs	Mpixels at 60Hz	Maximum Resolution	Pixel Pitch (mm)	Tiles per ECU	Maximum Resolution	Pixel Pitch (mm)	Tiles per ECU
1	2.62	1868 x 1401	1.97	81.0	2157 x 1213	1.51	48.0
2	5.23	2642 x 1981	1.39	40.5	3051 x 1716	1.07	24.0
3	7.85	3236 x 2427	1.13	27.0	3737 x 2102	0.87	16.0
4	10.47	3737 x 2802	0.98	20.3	4315 x 2427	0.76	12.0
5	13.09	4178 x 3133	0.88	16.2	4824 x 2713	0.68	9.6
6	15.71	4577 x 3432	0.80	13.5	5285 x 2972	0.62	8.0
7	18.33	4944 x 3708	0.74	11.6	5708 x 3210	0.57	6.9
8	20.94	5285 x 3963	0.69	10.1	5760 x 3240	0.57	6.0
9	23.57	5606 x 4204	0.66	9.0			
10	26.18	5909 x 4431	0.62	8.1			
11	28.80	6197 x 4647	0.59	7.4			
12	31.42	6473 x 4854	0.57	6.8			
13	31.49	6480 x 4860	0.57	6.2			

A useful rule of thumb is that one ECU can support a 1mm pixel pitch on 20 tiles at 60 Hz.

Don't stress about how many ECUs you will need. Go to www.microtiles.com and enter the display size and resolution you want. The online calculator will figure out the rest.

2.2 How many ECUs are required to support native resolution on Christie MicroTiles?

As shown in the chart above, the rule of thumb is that one ECU can drive up to 6 tiles at native resolution at 60Hz.

2.3 How many tiles can be driven by one ECU?

One ECU can drive several hundred tiles. However, for most practical applications, it is expected that a ratio of between 6-30 tiles per ECU will be typical.

2.4 Do you support any other input besides DVI?

Single-link DVI is the only input supported at this time.

2.5 Will Christie MicroTiles work with any media player or digital signage software provider?

Christie MicroTiles have been tested successfully with a wide range of media players and digital signage software providers. However, non-standard resolutions should always be tested on your desired media player and software.

2.6 Do you support higher refresh rates for smoother playback?

Unlike LCD and plasma technologies, the DLP® technology inside Christie MicroTiles does not require extremely high frame rates, such as 120Hz or 240Hz, for smooth playback.

Video playback on Christie MicroTiles is very smooth, and is frame-locked for sources running at 47-63Hz. If content is supplied outside of this range, Christie MicroTiles will automatically adjust it for optimal presentation.

3 Control and calibration

3.1 How many ECUs can be connected in one loop?

Up to 128 ECUs can be connected together and control a single Christie MicroTiles display.

3.2 How far away from the display can the ECU be located?

Each ECU ships with a 3m (9.8 ft) DisplayPort cable. If necessary, standard DisplayPort cables in longer lengths may be used, up to 7m (23.0 ft).

3.3 How are the tiles calibrated for x/y geometric alignment?

Christie MicroTiles use an 800x600 DLP® chip inside each tile. During the production process, each tile is calibrated through software so that the displayed image is geometrically aligned to the corners of the screen. As a result of this process, the native resolution of each tile is optimized at 720x540.

3.4 How does the color calibration work?

The light engine inside each tile contains three LEDs: red, green and blue. Sensors inside the light engine continuously monitor the temperature and maximum light output of each LED. Using this information, the ECU is able to make adjustments to the color space and brightness of each individual tile, so the entire display is always matched.

4 Power and brightness

4.1 What is the power consumption of Christie MicroTiles?

For a typical Christie MicroTiles system with color and brightness matching enabled, power consumption ranges between 45-70 watts per tile. Power consumption can be controlled by adjusting the brightness level of the display. A maximum calibrated brightness of around 800 nits is achievable at 70 watts per tile.

If brightness and color matching is disabled, higher brightness and power levels are achievable, up to 110 watts per tile. However, this is not a recommended operating level.

4.2 Why do Christie MicroTiles look brighter than alternative technologies with similar specs?

Customers frequently comment that Christie MicroTiles look brighter than alternative technologies, such as LCD, LPD or plasma displays, even if the published brightness specifications are similar. This may be in part due to the difference between controlled lab environments and the real world, where LCD, LPD and plasma screens tend to reflect a high proportion of ambient light, resulting in washed out and obscured images. One other factor to consider is the Helmholtz-Kohlrausch Effect (HK Effect), which demonstrates that displays with a wider color range, such as Christie MicroTiles, are perceived to be brighter than displays with a narrower color range.

5 Sustainability

5.1 Are Christie MicroTiles a sustainable or energy efficient choice?

Yes. Christie MicroTiles perform well across a wide range of sustainability factors, including energy consumption (over the entire product lifecycle), durability, ergonomics, reusability and recyclability.

For a full discussion of sustainability, go to www.microtiles.com and click on More Information and then Articles. Download the White Paper entitled *Christie MicroTiles: A Sustainable Solution*.

5.2 Are the materials used in Christie MicroTiles recyclable?

Christie MicroTiles include a solid metal housing and removable internal components, which total 80% recyclable and 90% recoverable materials. Recyclable materials are practical to reprocess into new materials and products to prevent waste. Recoverable materials include recyclable materials, and in addition any materials which are impractical to recycle but may be recovered in terms of energy.

As a reference point, the European Union Waste Electrical and Electronic Equipment (WEEE) directive mandates each Member State to be able to achieve recyclability of WEEE at 65% and recoverability at 75%. Recyclability and recoverability are estimated based on weight.

5.3 Do Christie MicroTiles comply with the Restriction of Hazardous Substances (RoHS) directive?

Yes, Christie MicroTiles comply with RoHS, and do not include phosphors, mercury, or toxic liquid coolants.

6 Specifications

6.1 What is a nit?

A nit is a unit of measure for luminance or brightness, equal to one candela per sq. m.

6.2 What is the expected lifetime of Christie MicroTiles?

The internal components of Christie MicroTiles are extremely long-lasting and reliable. The light engine is driven by solid state LEDs rated by the manufacturer for 65,000 hours to half brightness. Ultimately, when a component needs repairing or replacing, each display unit contains three serviceable parts – light engine, fans, power supply – which can be changed in less than 15 minutes by removing the front screen.

6.3 What is the contrast ratio of Christie MicroTiles?

Christie MicroTiles offer extremely high contrast, with brilliant whites and deep blacks. Unfortunately, consumer display manufacturers currently use several different methods of measuring contrast ratios, some resulting in extremely high numbers such as 3,000,000:1, making it very difficult and confusing for consumers and even professional buyers to compare different products. In addition, unlike Christie MicroTiles, the contrast level of many display technologies significantly deteriorates when placed in a typical space with high ambient lighting, due to veiling reflections and glare. As a result, the only way to compare products is to see them side by side in the desired environment.

6.4 What is the viewing angle of Christie MicroTiles?

Christie MicroTiles offer a wide viewing angle, with a viewable image up to 180° and much less color shift than most alternative technologies. However, similar to contrast ratios (see previous), the display industry uses different methods of measuring viewing angles, and the only realistic way to compare products is to see them for yourself.