

CHRISTIE® MICROTILES™

CONTENT PRODUCTION GUIDELINES 1.0

What you need to know to start your project



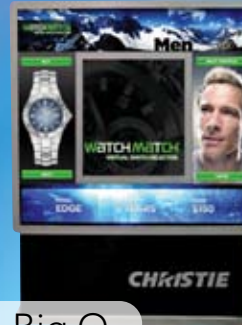
SHAPE IS THE NEW KING



16-Sheet



Digital Wall



Big O



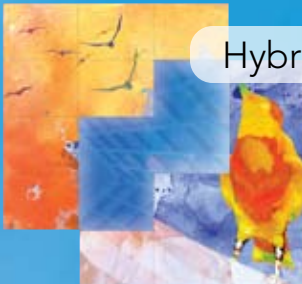
Digital Column



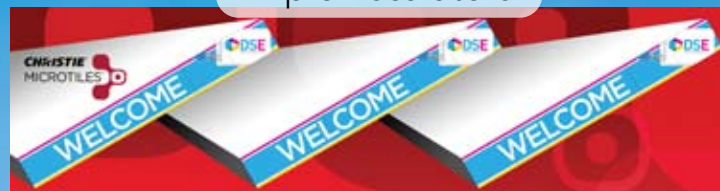
MegaStairs



Panorama



Hybrid Sky



Triple Escalators



Skyscraper

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MICROTILES: THE VISION, THE TECHNOLOGY, THE FREEDOM

Guidelines, ideas and advice from seasoned experts on how to access the full range of possibilities of Christie MicroTiles

Christie MicroTiles provide a digital canvas that removes any questions or worry architects and visual designers may have when choosing a display technology worthy of their environment, brand and content plans. Using spectacular color reproduction, superior image quality and unrivaled flexibility, MicroTiles allow the creative community to forget about making compromises. They can, instead, truly innovate and push the boundaries of creativity. And generate more impact with their audiences.

This document will help those involved in the creative and planning processes understand how to make the most of Christie's new display technology. It shares some basic knowledge drawn from the experience of leading content and motion graphic design studios in the industry on how to access Christie MicroTiles' full range of possibilities.

"MicroTiles represent a distinct revolution in display technology that allows users to create their own digital canvas or digital wallpaper. With MicroTiles, users can express their creativity and vision, and assemble the displays in ways that have previously been unattainable using current flat panel LCD, plasma or LED walls."

Bob Rushby, Co-Inventor of MicroTiles and
Chief Technology Officer, Christie

These guidelines will take you through the general principles of working with Christie MicroTiles, and provide ideas, advice and some core technical considerations that will help ensure stunning visuals. You will learn that these tiles are much more than just a new kind of monitor, and that carefully thinking through the objectives, audience dynamics and the shape of the display will produce powerful results.

Almost every new installation of MicroTiles will bring new ideas on what to do and how to do it. These guidelines and tips represent a foundation, and, as more and more creative people have the opportunity to push the envelope on big-impact displays, they will be expanded and enhanced.

THE JOURNEY

We enlisted leading digital media design studios to create relevant applications and produce truly stunning visuals

When our engineers started talking about changing the rules on how new display technology might work, we threw out convention and decided to think small, not big.

We developed small modular displays that deliver ultra-sharp, high-contrast images that can be tiled and arranged to make whatever size, shape and resolution an architect or retail/facility designer can imagine.

"All through the development cycle, I was involved in meetings with potential customers," says Mike Perkins, co-inventor of MicroTiles and Senior Product Developer at Christie. "These meetings would involve the creative designers as much as the purely technical engineering staff. And it never failed to surprise me how quickly people would get the concept. We would have a 20-slide presentation, and by slide three you could see the wheels spinning. A few times we barely got past that third slide. The creative types got it immediately, and started trying to apply it to problems and opportunities they have."

A year ahead of product launch, we started placing prototypes into the studios of some of the world's best digital content specialists and motion graphic design agencies. We received real-world feedback from them, and shared experience in developing content and projects for an entirely new type of display.

Arsenal Media of Montreal acted as lead brand strategist and creative directors throughout testing. Top firms such as Amigo Digital (London), Dagobert (Paris) and Show+Tell (New York), were all enlisted to test the displays and produce content – not only to support marketing initiatives, but also for the experience and knowledge gained from the work.

Motion graphic designers and creative directors tested resolutions, brightness and contrast, the impact of saturated colors, and the process of trying out content in unconventional shapes. It was quickly evident MicroTiles were much more than a new monitor. While the process of producing great content was not all that complicated, there were indeed rules to be followed, tools to be used and best practices to be exercised.

More than anything, designers learned that, by respecting the shape of the display, they got the best results. The stacks, stair-steps and irregular shapes work best when the content plays with them, and makes the most of the surface.

"Respecting the shape throughout the creative process is key. This is where we obtain such a strong relationship between the brand/messaging and the audience," says Denys Lavigne, President of Arsenal Media.

"Easily the best new digital signage / digital out-of-home product of 2009 was Christie's MicroTiles, but we also think that it is quite simply the best screen innovation of the decade!"

The term 'game-changer' is often bandied about. The term is deserved in this case."

Adrian J Cotterill
Editor-in-Chief, DailyDOOH



FREEDOM TO IMAGINE

MicroTiles' flexibility and vivid visuals makes producing a "wow factor" possible

Big-impact visuals in public spaces have always been a story of limitations and compromises.

LED walls, up close, often looked bad. LCDs and plasmas tiled together had big, unsightly seams. It's rare when the hoped-for "wow factor" is actually realized.

Christie MicroTiles changes all that.

Instead, the architects and visual designers charged with using digital visuals to bring a space to life have a digital canvas that can be used in ways limited only by imagination.

Creative designers have that freedom to create content in smart and compelling ways. They can entertain. They can surprise viewers. The tiles let designers remove themselves from the rectangular mindset of conventional digital visuals, and build the digital canvas and the visuals for it in ways that suit the environment and engage viewers.

The notion of freedom extends to how brands can use MicroTiles, because the technology finally offers something that can accurately replicate brand colors and retain that carefully protected integrity. Architects finally have something that works with and not against the physical limitations and realities of spaces. Events planners have something that is truly modular, portable and easily set up and torn down. And the people charged with running high-impact displays have a product that is long-lasting and very easily serviced.

"When we realized that this would be an opportunity to market our product to brands, to retail and to architects," says Kathryn Cress, Vice President, Global & Corporate Marketing, Christie, "that's when the excitement and passion for the project fully kicked in."

What has resulted is a MicroTiles brand, and a point of view, that are all about freedom for the people who use MicroTiles and the creative community that designs for them.

"The MicroTiles system offers so much freedom in the different shapes that can be made, and the ways tiles can be applied: from retail stores to corporate settings, all the way to incorporating them into the architecture of buildings."

Kathryn Cress, Vice President, Global & Corporate Marketing, Christie

VITAMIN C (FOR CONTENT)

Texture, saturation and unparalleled color spectrum give content an energy boost not possible on other displays

MicroTiles are like a vitamin supplement for full motion visual content, giving the creative a boost in visual energy and texture that's unique compared to other types of large-display formats.

With LCDs and plasmas, there can be a high reflectivity. With other display technologies, visuals are often soft and washed out. LEDs are hyper-bright and meant to be seen from long distances.

With MicroTiles, there is a crisp matte effect to visuals. They look good no matter how close or far a viewer may be. The technology allows a level of color saturation and breadth of color spectrum not possible with other display formats. And, across the tiles, the tones, brightness and contrast are continuously calibrated.

"When we walked into Christie's lab for the first time, and saw the MicroTiles, we got chills," says Denys Lavigne of Arsenal Media. "The color and brightness, and the texture, were really impressive."

"MicroTiles are like a vitamin for content in the sense that, if you follow simple guidelines, using strong saturated colors and high-resolution source material, it will take your content output to a new level."

Denys Lavigne, President, Arsenal Media

BEHIND THE SCREENS

A completely new display technology designed for high impact, but tuned to the real-world needs of venue and network operators, and creative designers

Christie MicroTiles are a massive step forward in large-format digital display technology. They offer deep, vibrant color and image reproduction, the widest possible viewing angles and a near absence of seams on display walls, with only a 1mm gap between the tiles.

The groundbreaking LED- and DLP®-based system is designed for long, reliable commercial use, with no lamps or other consumable parts to replace. Each LED is rated at 65,000 hours to half brightness usage, or nearly 7.5 years of continuous operation.

The tile screens are 16 inches (408mm) wide x 12 inches (306mm) high, and the footprint of the tile units is only 10 inches (260mm) deep, with just 2 inches (50mm) of clearance needed at the rear for ventilation. Our engineers designed MicroTiles to be fully and easily serviced from the front, meaning there are few places where the tiles cannot be located.

The displays generate 115% of the color spectrum possible from NTSC or PAL video signals, meaning viewers are seeing colors they have never seen before on displays.

The tiles are “self-aware” – meaning that the time-consuming and costly color calibration needed to keep conventional “video walls” looking uniform is automatically and steadily handled by sensors built into every tile.

Designers use the software they prefer and the equipment they want to produce their visuals. Any PC or media playback device can potentially be used as a signal source, with Christie’s External Control Units (ECUs) processing and delivering the signal to the tiles. However, we recommend extensive testing to ensure what you want to achieve is matched by what your technology can deliver.

“That’s one of the first comments we get when we demonstrate the MicroTiles. They literally say, ‘Holy cow! Look at the colors.’”

Bob Rushby, Co-Inventor and Chief Technology Officer, Christie

QUOTES FROM PEOPLE WHO HAVE SEEN IT

“I think it is just an incredible opportunity to do something new and different, and utilize this product in an architecturally different way.”

Susan Senyk, Sparks

“Now we can do things with video that we’ve never done before, and I am really excited about it.”

Robert Sneed,
Dimensional Communications

“We love them because they are so vibrant and so cost-effective.”

Giselle Vogel, Video Film Systems


“This is the 400-inch plasma screen you’ve always wanted.”

Brock McGinnis, Westbury National

“Why are we so bullish on MicroTiles? Simple: it’s a differentiator that gives way to very creative, unique ‘out of the box/rectangle’ projection images and puts that in the hands of the most creative systems designers on the market.”


Gary Kayye, AV Industry Analyst

DESIGNING CONTENT FOR MICROTILES: TOP 12 THINGS YOU NEED TO KNOW



The same principles and practices that lead to design excellence for other digital display media apply to creating content for MicroTiles. You'll use the same creative software tools, and go through the same processes for planning, design, animation, video integration and final rendering. The difference, though, will be in how you approach content creation from the beginning – how you visualize the optimal fit of an installation, in a specific context, and how you get the most out of a radically new creative premise: shape.

The world-class creative teams that worked with us during final development and launch learned many lessons about how to optimize the impact of a MicroTiles project. We've highlighted a dozen insights and specific recommendations on working with tile displays. This advice will help you understand the new realities – and possibilities – of working with a digital canvas of various shapes and sizes.



1

PLANNING A PROJECT

One of the most important things to remember and embrace when putting together a MicroTiles display project is the need to get both the creative and the technical people involved early. There are technical reasons but, more to the point, this collaboration will have a huge influence on the success and lasting impact of a project and the investment made. Creative people AND technical specialists need to be involved in conversations, from the start, about how to make the most of MicroTiles.

So first bring together all the members of the team that will be working with the tiles, and do that early in the planning process. Ideally, bring them on site, to understand the physical surroundings and the conditions that have an impact, such as natural light and the dynamics of the venue. The creative people need to understand the sightlines and distances from which people will typically encounter the display. They will want to know whether people are moving past quickly or slowly, or will linger. They'll want to understand the opportunity for interactivity, if there is any. They'll talk about shapes, what might be possible and appropriate, and how content would work with those shapes. The operations people, at the same time, need to understand the infrastructure challenges and the content ideas so they can develop a technical plan and bill of materials that matches the technology's capabilities with the aspirations of the creative team.

There are five well-defined steps:

1. Match up and validate the business and communications objectives to the digital canvas options presented by the physical configuration of the location.
2. Define the final shape and the appropriate content model strategy.
3. Working with a systems integrator or technical project manager, establish media player requirements to produce the desired quality of signal output.
4. Select playback software.
5. Develop a content grid that will help structure and tune content with the shape configuration, and then start designing.



2

RESPECTING AND CREATING SHAPES

While MicroTiles work beautifully as vibrant, almost seamless, video walls, building big rectangular or square displays doesn't necessarily make optimal use of the countless different shapes in which MicroTiles can be arranged. The tiles open up new creative doors, allowing you to explore new ideas and try different approaches to creating high-impact visuals. MicroTiles give interior space designers the flexibility to fit visuals to the environment and the situation, and to create elements of surprise and whimsy. Design elements for motion visuals should acknowledge and respect the shapes that tiles can be stacked and arranged in, and work within those lines when it makes sense. Make the most of the opportunity to create something special – from the preliminary conceptual analysis and continuing with each design element in the content piece.



4

WHAT TO USE AND HOW TO RENDER IT

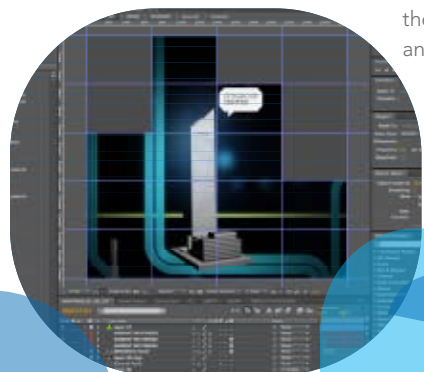
All the standard software tools that motion graphics designers use to produce eye-catching video can be applied to MicroTiles displays. There are no limitations because the control unit that drives, choreographs and manages sets of tiles is looking for a simple signal input. The real work is in using optimal video formats, encoding presets and resolutions to ensure image and playback quality are optimized. Studio workstations producing content must have the CPU power, memory and storage to efficiently produce the highest-quality files, and media playback equipment in the field must also be properly equipped to drive a superior signal to the tiles. More than a year of testing made it clear that video encoded as h.264, and output as .mov files, produced the best blend of quality and manageable file sizes. Other formats work, but h.264 is the most efficient. Consult our technical documentation to fully understand what to use and how to produce superior work.



3

DESIGNING WITH A GRID

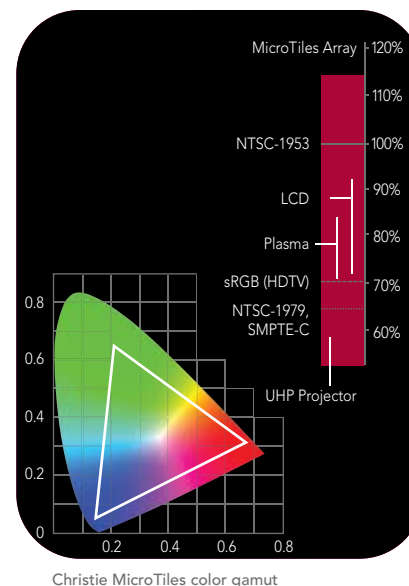
Physical displays have a structure about them, and content designed for tiles also needs a structure. In the same way that Website and interactive designers carefully think through the placement of elements and the way eyes travel around a screen, MicroTiles displays need to be considered from a visual perspective. That organization is made relatively easy by the grids created when tiles are stacked and arranged. Use that grid plan to determine where visual elements are positioned and how they arrive, move around and leave the display's viewable area. Working with a grid allows designers to manage how visual elements sit on a screen, and how the micro-seams between tiles can disappear or, done sloppily, be accentuated by elements and font placement.



5

COLOR CHOICES

The LED light engine technology that drives MicroTiles produces 115% of the NTSC or PAL video color spectrum, meaning viewers are seeing a range of colors not possible on other display technologies. Deep saturated reds and greens and many blues look particularly vibrant on MicroTiles, as do blends of these colors. Mid-toned colors look better than they will on other display technologies, but do not have the stopping power of truly saturated colors. Whites and weak colors will produce less than optimal results, and their use minimizes the opportunity presented by MicroTiles. Blacks on the other hand will output at a rich, deep level rarely obtained with other types of displays. We strongly recommend integrating black areas in the design to create visual depth and optimize saturated color contrast impact.



6

CONTENT AND RESOLUTION

The native resolution of a MicroTiles display is the simple math of adding up the combined horizontal and vertical attributes of each tile to arrive at an aggregate number. For example, a digital column of 1 x 5 tiles has a native resolution of 720 x 2700, and content should be created to suit that resolution. A standard skyscraper shape of 14 tiles (see above visual) features a basic native resolution of 2880 x 2700 but, because it is an irregular shape, the content will display only on the surface where the tiles are positioned. Nevertheless, the original content canvas size will be 2880 x 2700, and the areas not covered with tiles can be black or may have content, although you have to plan that it will not be displayed on the installation.

The best results come when content is designed specifically for the total native resolution or, if this is not possible, the highest practical resolution at the same aspect ratio. Producing at a very high resolution allows for fine-tuning to different shapes and arrangements, and retains the integrity of fonts. We recommend you produce the content at the highest practical resolution, even if the planned final output is lower.



MICROTILES DESIGNER

Free software lets you fully imagine, plan and budget MicroTiles projects in a few mouse clicks.

We know trying to imagine how spectacular a MicroTiles display can be is enough of a challenge, never mind trying to build an accurate plan around it. So we've developed a free software tool to make that work quick, simple and powerful.

The Christie MicroTiles Designer software application allows users to easily see how their design concept would look in the targeted space. The friendly custom interface lets users develop a rich simulated visual representation of a MicroTiles display project. Users simply import dimensions of the space, and an image of the intended display area, and then overlay still or video content and watch as the environment comes to life.

The Designer software allows users to move the display around the target area, add or remove tiles, and manipulate the overall size and shape of the array until it truly, visually works. The process is several big steps beyond looking at concept images, virtually putting the projects' supporters in the planned environment. The MicroTiles Designer software even estimates projected energy consumption levels, total weight of the hardware and the optimal way to wire the tiles together. It creates a simple reference diagram and generates a bill of materials so that users know what they'll need to order and are ready to go.

MicroTiles Designer software is available to download, free, at www.christiedigital.com/microtiles

7

SOURCE MATERIAL

The quality of the completed creative is only as good as the quality of the material a designer is provided by a client. If the material provided is of poor quality, the finished content will also be poor. Whenever possible, creative work should be done using the original source material to ensure the finished creative retains a very high quality. The quality and texture of MicroTiles is such that imperfections that go unnoticed on lesser display formats are very evident on the tiles. This is particularly true with saved Web image assets (at only 72 dpi resolution) and video produced in a standard 4:3 format which would be up-scaled for a much larger resolution. Working instead with high-resolution source material, or an adapted resolution to the scale of the asset or video, will limit those imperfections.

8

CONTENT AND HYBRID INSTALLATIONS

MicroTiles provide venue designers with a compelling opportunity to work beyond the dimensions of physical displays and start to play with them and integrate them into real-world environments. MicroTiles can frame shop entry areas or straddle support beams. They can be the digital elements of large-format print installations for marketers, creating an element of surprise and visually activating something that's otherwise static. These are displays that don't have to complement a fixture. The tiles can BE the fixture. With MicroTiles, you have the opportunity to think beyond "where to put the monitors" and instead about how to work with the space and create the most compelling message, with the range of available media that works best. Think big, and differently.



9

MICROTILES AND INTERACTIVITY

It is rarely enough now to push digital content to screens and expect viewers will be transfixed. People want more. They want to be entertained and, in the right context, engaged. Well-considered interactive plans can draw people into the experience of a MicroTiles display, and have an impact on the audience.

MicroTiles are ideal for interactive applications, because the image is always vibrant and crystal clear, even when viewers are up close. We've done extensive testing and trials with gesture-based technology that makes aspects of the visuals respond to the movements of viewers, and can even transform MicroTiles arrays into conventional touch screens. In the design of interactive content, there should be a consistent drive to offer value and entertainment, and create an experience that is fun, not frustrating.



10

CONTENT THAT WORKS

Think of content design and the software application as a whole – the two can't be separated. MicroTiles give you shapes, but what will they do for you, and for the people who see and engage them? Your MicroTiles display, and the content that lights it up, should have a well-considered and defined strategy and visual structure. Your thinking needs to be considerably more advanced than big, pretty visuals. What are you trying to communicate for the venue? The client? The brand? Will it stop viewers in their tracks? Will it add value to the environment? Will it provoke the emotion or response that is part of the strategy? Content that works well will optimize design, provide value for the viewing audience and synchronize business and communication opportunities in a particular space.

11

CONTEXT THAT WORKS

Developing content within the context of the environment and the dynamics of the viewing audience is fundamental for success. The tiles should look like they belong in the environment, and are part of the plan. But be cautious about how well the integration is done, as you are doing this to get messages noticed, not have them blend. In designing content in context, think about what is going on in that environment and what's compelling and relevant for viewers, at that time and place – not just in general. Think, as well, about the emotions. MicroTiles that fill the façade and doorway of a retail shop might be used to drive the brand and to draw people in. But, inside the store, the content on a MicroTiles display on a feature wall might be less about selling and more about the experience, making people feel good about being there, keeping them engaged and making them want to come back.

12

THINGS TO REMEMBER

While the MicroTiles technology is new and opens up tremendous design opportunities, the tiles are fundamentally digital displays. Their impact will rely heavily on the quality of the content, and the thinking behind each piece.

- Ensure the source material you are working with is of the highest possible quality and resolution.
- Be methodical and smart about your technical set-up, ensuring the software and hardware used to produce content and play it back meet all your requirements. Don't cut corners.
- Remember the visual structure of the digital canvas and think about how elements are positioned, and how they arrive, build on and leave that canvas.
- Earn the time you get with viewers. Audiences can be transient and attention spans short, so ensure your content has stopping power, and delivers quality and relevance for the targeted audience.




SPEC SHEET

Technical specifications

Model numbers	display unit	• D100	
	screen	• S100	
	external control unit (ECU)	• E100	
Physical specifications		Display unit	ECU
	height	• 306mm (12.05")	• 50mm (1.97")
	width	• 408mm (16.06")	• 259mm (10.20")
	depth	• 260mm (10.24")	• 191mm (7.52")
	weight	• 9.2kg (20.3lbs)	• 1.6kg (3.5lbs)
Display specifications	screen size (diagonal)	• 510mm (20")	
	native resolution per tile	• 720 x 540	
	pixel pitch	• 0.567 x 0.567mm	
	maximum calibrated brightness	• 800 nits (cd/m²)	
	LED lifespan (50% brightness)	• 65,000 hours	
	peak white color temperature	• 6500K	
	adjustable gamma	• Yes	
	color space (CIE 1931)	• 115%	
	optical system	• DLP® 0.55" SVGA	
Processing and control	input signal compatibility	• Single-link DVI	
	processor bit rate	• 165M pixels per second	
	data link bit rate	• 5Gbps	
	color processing	• 13 bits	
	refresh rate	• 47-63Hz frame-locked	
	control interface	• Ethernet, USB 2.0, Serial	
Power	power supply	• AC 110V/220V, 50Hz/60Hz	
	power consumption per tile at full brightness	• 110W typical* • 130W maximum	
	heat load per tile at full brightness	• 375 BTUs/hr typical* • 443 BTUs/hr maximum	
Operating specifications	operating temperature	• 5°C (41°F) minimum • 40°C (104°F) maximum	
	humidity	• 35-85% non condensing	
	clearance for ventilation (rear)	• 50mm (2") minimum	
	vibration/motion limit	• 0.5G	
	noise level per tile at full brightness	• 45dB at 25°C (77°F) ambient	
	run time	• 24/7	
Accessories	• Mounting brackets for each tile above 5 high • Base feet for levelling the bottom row		
Regulatory approvals	• 2002/95/EC RoHS CAN/CSA C22.2. No 60950-1-03 First edition • Certifications pending		
Limited warranty	• 2 years parts and labor • Contact an authorized Christie representative for full details of our limited warranty		

* In an array with brightness and color matching enabled, actual power consumption and heat load at full brightness may be up to 30% lower.

CONTENT AND TECHNICAL CONSIDERATIONS: TOP 12 THINGS YOU NEED TO KNOW



Content production is not only about good ideas. It's about understanding the media and the channels you are using. This is particularly true with projects involving technology, hardware, software and digital displays.

This portion of our guidelines focuses on technical considerations when producing content for MicroTiles.

Much of this information applies to all types of displays, whether you are using LCDs, LED screens or projectors. But it adds more specific considerations related to the context of MicroTiles, and the technical realities related to creating content for unique shapes.

1

PLANNING TECHNICAL INFRASTRUCTURE

Best practices in the AV, digital signage and digital out-of-home industry all call for adequate planning and collaboration among the client and the technical and creative people. It is no different when working with MicroTiles.

Great creative will drive success, but there are underlying technologies, technical considerations and processes that can ensure the files are designed, rendered, compressed and played out in a way that optimizes the opportunity. Before starting content production, shape, output resolution, media player and playback software all need to be identified.

Our creative partners tested a variety of hardware and software configurations throughout the preliminary tests – some quite complex, and others that were simple and efficient. For example, a standard Mac Mini, with iTunes for playback, proved very stable on a column of tiles outputting at 100% resolution. For a massive wall of 96 tiles (16 wide x 6 high), we used four PCs with Intel i7 quad core 860 processors and Nvidia GTX260 graphics cards, slicing the content in four sections and using a standard digital signage application to synchronize playback across the sections. That produced a display with 5760 x 1620 resolution.

Good planning reduces risk and links all the components effectively.

2

THE ROAD TO CONTENT VIEWING

There is vast complexity and sophistication in the engineering of MicroTiles, but the actual process of driving these displays with content is simple.

1. A rich media file – usually but not exclusively video (.mov, .mpeg, .avi, etc.) – is developed that already matches or can scale up to the aggregated resolution and shape of a MicroTiles display.
2. That file is loaded, manually or over a network connection, into the playlist of scheduling and distribution software that manages and plays out media files. That software is typically an installed third-party application on a PC.
3. The DVI signal output from the PC uses a line cord to feed into an External Control Unit (ECU), a dedicated Christie device used for MicroTiles.
4. The ECU is the brain of a MicroTiles installation. It processes and drives the signal to the tiles, and monitors and controls the state of all the tiles. All the tiles calibrate automatically, working with the ECU.

The keys to ensure this workflow goes smoothly are the right output resolutions, optimal configurations for encoding, processing and playback hardware specs that have enough power, and playback software that does what's ideal.

You should build in the time to test your hardware and go through all the typical, but essential, learning and troubleshooting to ensure your operating system, various software apps, drivers and graphics cards are all playing nicely together. You want stability and desired performance, so that your focus can stay on producing high-quality content.

In your testing, you should pay attention to things like stability and the absence of glitches, the fluidity of the video playback, and the demands on processing power. You should test your software and hardware combinations for a week or so before drawing any conclusions.





Christie ECU

PLAYBACK SOFTWARE

There are scores of applications on the market – most of them labeled as digital signage software – that can do the work of organizing, scheduling and driving high-quality signals to a MicroTiles display. Some of those applications are elemental, while others are more sophisticated than what's needed for many projects. Your decision should be based on such variables as whether you want to own it or rent it (many companies have Software as a Service offers) and the platform's support for needed resolutions. More than anything, you will want to ensure the software capably supports your content plans, which might include the need to steadily poll external databases for dynamic information or synchronize screens.

As we developed MicroTiles, we worked with numerous companies to test their capabilities and compatibility with the ECUs and tiles. Those companies included C-nario, CoolSign, Harris, Float 4 Interactive, Omnivex, Scala, Remote Media and WireSpring. We also successfully tested driving the tiles with some very simple playback engines like VLC and even the video capabilities of iTunes. There are many other companies that also offer effective playback solutions that you may wish to investigate.

MEDIA PLAYERS, GRAPHICS CARDS AND RESOLUTION

There is no out-of-the-box, universal computing solution for driving MicroTiles. What's required is, in most respects, defined by creative needs and audience dynamics. Large walls of tiles with demands for very high resolutions will require powerful CPUs and graphics cards. More modest installations have been tested very successfully with such devices as the Mac Mini. Graphics cards – such as those sold by Matrox, Nvidia and ATI – take over much of the video playback from a computer's CPU, and are recommended for many MicroTiles projects. Driver support for uncommon resolutions can be challenging, and you may have to resort to third-party software to achieve the resolutions needed for your display. We have used SwitchResX for Macs and PowerStrip for PCs for managing these different resolutions.

RENDERING COMPLETED FILES

As a baseline for production, we recommend developing creative at the native resolution of the entire MicroTiles display or, if this is not possible, the highest practical resolution at the same aspect ratio. People working in creative production are very familiar with the need to wait (and wait) for finished creative to render. With MicroTiles, and mega-pixel displays, that wait time can be compounded because of file sizes. Developing content for this medium is not a last-minute job; generating quality projects is an overall process that takes planning and time.

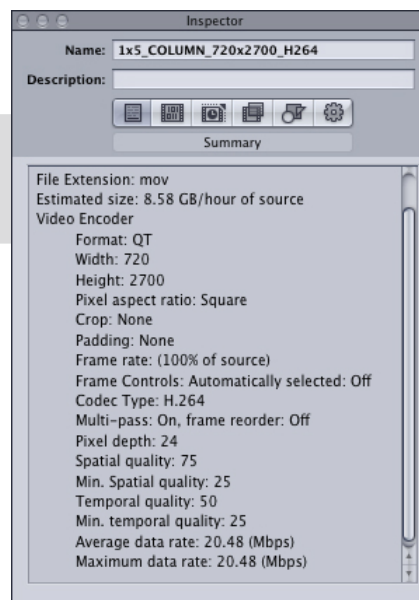


6

COMPRESSION TECHNOLOGY CONSIDERATIONS

There are many options on the market to compress files.

Preliminary tests have led to the recommendation of outputting files in .mov format, using h.264 compression. Comparison testing made it clear that h.264 provided the optimal solution for high-quality video files, flexibility in resolution and completed sizes that were manageable for playback, transfer and storage. There is no firmly established recipe for encoding MicroTiles content, but we have a standard range of settings we have learned are reliable and produce optimal results. The screen shot here shows how we set it up, using Compressor.



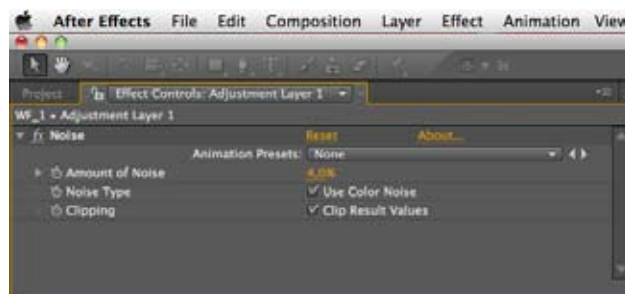
Along with Compressor, we have found numerous video compression software applications that provide satisfactory results for encoding completed full-motion creative. Among those we have used successfully: Sorenson Squeeze, Autodesk Cleaner, Adobe Media Encoder, MainConcept Reference, Episode Pro and Quicktime.

Bitrate selection is a variable that depends on either the hardware setup of the playback device (such as CPU power, RAM and graphics cards) or the technical approach for the content (will the material be played at native resolution or scaled?).

7

MANAGING GRADIENTS AND POSTERIZATION

Managing gradients is a challenge across the creative design community, as encoding techniques that make file sizes manageable also create some visual havoc. The math behind compression that removes redundant bits tends to take the lovely gradients done in original creative and reduce them to regions with abrupt zones and halos. It's a common challenge, known as posterization (or color banding), that is accentuated on MicroTiles because the visuals are so crisp and colors so vibrant. Through trial and error, we've developed tricks that minimize posterization. We introduce noise (dither) in the files, and the screen capture above shows what we do. Increasing the number of bits per color channel also tends to limit posterization.



CHRISTIE MICROTILES EXTERNAL CONTROL UNIT (ECU)

THE POWER OF CONTROL

One of the greatest challenges faced by any modular display technology is the ability to control, match and monitor each discrete unit to ensure it works in harmony across the entire display. We address this challenge with the Christie MicroTiles ECU. Required for each Christie MicroTiles display, the ECU delivers content to the tiles while providing system level control, auto-calibration and monitoring of the full display. Simple, small and affordable, the ECU is compatible with all standard graphic formats, playback devices and mainstream creative and digital signage software.

Easily display content: To play video or data on the tiles, simply connect a PC or other media player to the ECU using the single-link DVI connection provided. If your PC or other media player has multiple video outputs, simply connect each output to a separate ECU. The ECUs work together to balance color and brightness automatically.

Color and brightness auto-calibration: Unlike other solutions that require painstaking manual fine-tuning during set-up and over the lifetime of the display, the ECU monitors the status and performance of each tile, and automatically calibrates color and brightness across the entire display in real time. Sensors within each tile continuously monitor the performance of each LED independently, and this information is reported to the ECU every few seconds. The ECU then adjusts all the tiles in real time to a common color space and brightness level. And, even if a light engine is entirely replaced in one of the tiles, the system will adapt automatically to ensure the display is evenly matched. In configurations where more than one ECU is used, the ECUs communicate with one another to perform these adjustments.

Choice of resolution: Each ECU can drive hundreds of tiles, and more than 100 ECUs can be connected to a single array, allowing you to achieve almost any resolution imaginable. In a more complex set-up, you may wish to have multiple ECUs. The ECU will detect this and arbitrate to a single master controller, with any other ECUs in the network acting as slaves. As a rule of thumb, six tiles per ECU can support native resolution. However, Christie MicroTiles have outstanding scaling technology built in. In many cases, this enables you to lower your system costs, while maintaining superb image quality... the choice is yours.

Simple interface: By connecting to the ECU locally or remotely via Ethernet, the display can be controlled through an intuitive Web interface. In addition, a radio frequency remote control can be used to navigate menu commands on the on-screen display from up to 100 m (328 ft.) away.



8 UP-SCALING

Up-scaling creative reduces file size and possibly the burden on the playback hardware and software, and can produce some very good results. For projects in which the majority of viewers will view tiles no closer than two or three meters (6–9 ft.) away, up-scaling by as much as 50% will still produce very pleasing results. When viewers will be in close proximity, consider limiting or entirely avoiding up-scaling to get optimal visual results and audience impact. If fonts will be subject to up-scaling, ensure the text already uses large, thick font sizes.

9 RESOLUTION AND SOURCE MATERIAL

Develop content at the native resolution of the overall MicroTiles display or, if this is not possible, the highest practical resolution at the same aspect ratio. By producing to the maximum resolution, you have a source archive that can be re-used and files that are easy to adjust and compress down. Starting with lower resolutions and then up-scaling instantly introduces compromises that may be entirely acceptable in some projects, but a problem in others. Creatives should apply the same standards used in the publishing industry, where the importance of using adequate resolution in relation with the canvas size is essential.

10 ABOUT VIDEO SOURCES

In some cases, it may be necessary to use video sources with lower-than-desired resolutions. If these video sources are fundamental to the creative, embed them at a satisfactory resolution and create a visual environment – a skin – around them.

MicroTiles have arrived on the scene just as the motion graphics industry is undergoing its own technology revolution. Companies such as Red are introducing affordable (in professional terms) cinematography cameras capable of recording at resolutions up to 4096 x 2304 pixels, directly to flash memory. These are the sorts of visuals that are looking for a display medium to do them justice – like Christie MicroTiles.

11

INTERACTIVITY

Interactivity plugs in well with MicroTiles, in either a gesture-based or a touch screen environment. Our tests with gesture-based interactivity on MicroTiles have demonstrated great value and impact on the user experience in both ambient and retail touch screen applications. We've found compelling results are possible using cameras and sensors that register and trigger responses to gestures and, with laser technology, to precise movements. Well-considered interactive projects change the dynamic from a beautiful large-format display to look at, to one that introduces viewers to anything from whimsy and fun to utility, such as way-finding applications.



12

FINAL ADVICE AND REMINDERS

- Make sure your technology for production and playback truly meets the project's needs.
- Test, test, test, until you get the production recipe that's right for you.
- Your choice of graphics cards can be very important for large projects with unconventional shapes.
- Recognize the challenges of gradients and posterization, and have your plans to minimize the issue or avoid it.
- Get to know the free Christie MicroTiles Designer software. There's a lot in there.
- Always respect the shape, and make the most of it.
- Always choose a qualified content provider.

REMOTE MANAGEMENT, MONITORING AND CONTROL

Whether you have one display or hundreds, Christie offers the choice of remote management, monitoring and control services. Many organizations have their own solution for display management and control. For those who prefer another solution, our Christie Managed Services team offers a portfolio of proven and reliable services – all designed and customized to meet the unique needs of your organization or signage network.

Like many of the Fortune 1000 companies that rely on Christie Managed Services to monitor their digital assets and devices, you don't need to invest in development resources to manage or sustain your business. Christie acts as an extension of your own expertise. We bring our AV/IT industry know-how, qualified local field technicians, a national footprint and a commitment to drive a project through to completion to fully support your programs.

A partnership with Christie Managed Services puts the control of your assets where it belongs – with you.

INDIVIDUAL DISPLAYS OR MEGA-PIXEL WALLS

Christie MicroTiles are designed to work with leading playback systems and video processors – ensuring that you can choose the media player, scheduler and video processor that's just right for your business.

When your design calls for a mega-pixel wall with multiple sources that need to be managed and controlled, we have the solution for you. Chosen by the world's foremost broadcasters, event producers and designers, the popular Christie Vista series of video processors and universal routing switchers provide the ultimate freedom to accept any source format, convert it, and send it to any output display. With the Christie Vista URS, source content is processed while being routed and most or all of your front- and back-end boxes are eliminated – reducing your requirements for processing down to one piece of equipment and one point of control.

ACCREDITED MICROTILES CONTENT EXPERTS

LEAD CREATIVE AGENCY AND BRAND STRATEGIST



Montreal
www.arsenal-media.com

Founded in 1999, Arsenal Media is a content marketing agency fully dedicated to the digital out-of-home (DOOH) industry.

Arsenal offers innovative consulting and planning services for various types of digital screen concepts and applications. Key expertise includes targeted content strategies and unidirectional and interactive digital content using the latest technologies available on the market. Addressing audiences on the move, Arsenal Media also develops DOOH-related mobile marketing applications.

Located in Montreal, Canada, Arsenal has developed digital content and projects for a wide variety of markets and clients such as RONA, RE/MAX, Quebecor (Archambault), Metro, Quebec Tourism (Montréal), Transcontinental and Christie Digital Systems. Arsenal has provided lead creative direction and brand development services for MicroTiles.

"I think one of the most significant innovations related to the arrival of MicroTiles on the market is that not only does it allow us to better integrate digital screens/canvases into environments but it also forces us to rethink the role and value we attribute to digital installations in the world today.

This ultimately benefits both brands and audiences.

Christie MicroTiles also change the way we relate to digital displays. Showcasing content on unusual shapes transforms the relationship/dialog we establish with an audience. This makes it possible to generate a stronger impact and a better opportunity to distinguish your brand and your environment. The end result is a higher degree of interest in an installation or a message.

That is why it is so fundamental to respect each individual shape in the creative process.

From a technical perspective, industry specialists will appreciate the unrivaled visual texture of MicroTiles and how the matte finish provides such a unique blend with its superior color, brightness and contrast capabilities.

MicroTiles may not be the natural choice for every type of digital installation, but, in contexts where there are profitable business opportunities and the need to establish strong visual statements, it can be a powerful creative platform.

And it couldn't arrive at a better time in the evolution of the industry."

Denys Lavigne, President



London
www.iamigo.co.uk

Amigo Digital is a creative agency working from a studio in central London, England, that specializes in developing content and advertising campaigns for the digital out-of-home sector.

Using a powerful combination of creative and technical expertise, Amigo is best known for its unique approach to delivering creative solutions – making best use of network technology to maximize delivery of key messages across high impact, captive audience and retail networks.

Amigo's client list includes Unilever, Macmillan, SKY Television, Finlandia Vodka, BMW Mini and such entertainers as Pink, Elton John, Tina Turner and Paul McCartney.

"When you first see visuals on MicroTiles, your initial instinct is to reach out and touch them – they are SO life-like. There is absolutely no pixelization and the resulting image has the quality of a high-resolution print – but on a digital screen.

We've found two things make this possible from a creative perspective: blacks are truly black on MicroTiles, providing designers with a wide range of contrast to use; and colors look incredibly saturated and true. They are vivid, bright and they pop off the screens.

When we design for MicroTiles, we think in a number of smart ways and keep four key elements in mind: scale, shape, resolution and clarity.

As the size and shape of MicroTiles installations change, so too does the resolution. Designing for large displays with moving imagery always poses challenges, but with MicroTiles we need to factor in larger file sizes, increased processing time and disk space.

We have found vivid colors and blacks work extremely well, as does a broad range of subtler shades and lighter colors. The only way to describe the end result is illustrious moving print. The blacks are true, colors are saturated yet well defined, overall clarity is pin-sharp, text is legible and crisp, and movement on the displays is smooth and precise.

As we see it, MicroTiles are everything moving image designers have been waiting for."

Alex Hughes, President

ADDITIONAL ACCREDITED MICROTILES CONTENT EXPERTS

dagobert

Paris
www.dagobert.fr

Dagobert is a creative agency based in Paris, France, that advises and supports major brands in the definition, creation and deployment of their digital strategy. Content developed by Dagobert can be integrated into Web, social networking, touch screen, digital signage, branded TV and mobile applications.

Since 2000, Dagobert's multidisciplinary teams have developed an extensive range of state-of-the-art digital solutions, each drawing on an optimal mix of advanced skills and technologies.

Dagobert's client list includes Citroën, Longines, Crédit Agricole, SNCF, the French national lottery, Yves Rocher, Hertz, Louis Vuitton and Cartier.

"MicroTiles gives us an ultra-high-quality digital display that can be adapted to any shape or size. MicroTiles are attractive and attention-grabbing at any viewing distance, and we've found them to be quick and easy to assemble and maintain.

This leading-edge technology is well suited for a variety of applications.

MicroTiles' superior image quality and tremendous flexibility for creating an infinite array of shapes and sizes mean they can be integrated seamlessly into a point-of-sale branding solution or an event-specific application (product launch, etc.).

MicroTiles offers unprecedented versatility thanks to the modularity of the technology, which makes it possible to create an endless number of configurations – each more exciting than the previous ones. The shape of the installation can be organically incorporated into the on-site architecture with spectacular results."

Olivier Debin, President

SHOW+TELL

New York City
www.showandtell.com

Show+Tell is a creative technology company, based in New York City and specializing in designing and managing digital media installations.

For more than two decades, we have worked with architects, designers and developers to create exciting and unique solutions for corporate, entertainment, financial, museum, retail, and sports installations. Our team provides a full range of services including strategic consulting, content design and production, project management, software programming, systems development, and on-going operations support.

Our clients include ABC, Bloomberg, Chase, Dreamworks, LG Electronics, Louis Vuitton, M&M's, NBC, Toys "R" Us, Time Warner Cable and many others.

"When Christie approached us to collaborate on the launch of its MicroTiles, we were thrilled with the partnership opportunity.

Our design team went to work and treated this exercise like we do all of our projects: first understand the context and then create the content.

From DOOH advertising to ambient exploration, and from way-finding to brand-specific content, Show+Tell created various animations for three unique MicroTiles configurations. To address the varied audience interests of architects, advertisers and brands, media properties and event marketers, we customized each piece to engage, deliver and showcase MicroTiles as a medium.

Our team found the screen configurations were inspiring to work with, and it was clear the possibilities were endless."

Lisa Kwon, Design Director

Q/A: MOST FREQUENTLY ASKED QUESTIONS

New technology, game changer: Launching an innovation like MicroTiles has people intrigued about how they can make the most of this new digital display. Here are some of the most frequently asked questions about content creation for MicroTiles.

What software do I use to drive the displays? Is it Christie's, or can I use whatever I choose?

1

MicroTiles are a software-agnostic display solution that does not specifically require that a particular application be used to play files. Many software platforms used in the digital signage industry have been successfully tested, and even iTunes can function as a simple playback tool. However, the software choice is still very important and should be made based on the real-world needs of the project. For example, some software platforms are better than others at handling different resolutions or synchronizing content. Some are intended for large networks with many end-points but, as a result, make managing a single site more complicated and laborious than you may want. Carefully think through what your performance and operating needs will be, test some options, and choose what is most suitable for the project and will deliver the best results.

I will be creating content for a large MicroTiles display with unconventional shapes. Do I need a special software application and/or computing equipment to create and render the files?

2

No special software or computing hardware is specifically required. However, we strongly recommend using professional-grade motion media software and computers with the processing power required to efficiently create and output quality work for very large digital canvases. For most creative studios, this is the norm. Working with unconventional shapes requires creating a simple mask, a common task for content designers.

What signal inputs and file formats are accepted and supported? Are there formats I should avoid?

3

The input into the ECU is DVI, so you should ensure your chosen media player has this output. While many conventional file formats are supported, testing and experience has shown h.264 .mov video files are the optimal choice because of the ability for content developers to bridge high-quality visuals with manageable file sizes. Formats to avoid are those that are uncommon and therefore hard to continuously support.

Am I wiser to use video or Flash? Or does it matter?

4

It matters, and it depends on your objectives for your MicroTiles display and content. Well-produced video will provide the greatest visual feast, with vivid, rich colors and smooth movement. However, Adobe Flash files with embedded scripting give operators, by far, the most efficient means to dynamically update information on screens. Changing information in video requires encoding entirely new files, while changing information in a Flash file can be as simple as keying in new text on a remote file, or using automated data feeds.

What is the native resolution of a tile? And how do I determine resolution across many MicroTiles?

5

The native resolution of a single tile is 720 x 540. The actual resolution of your overall MicroTiles display is a simple multiple of that set of numbers, based on how many tiles are put together. The MicroTiles Designer software that's available free to users will help you determine your final resolution. When you are producing content, your point of reference should always be optimal resolution. But experience has shown lower resolutions produce excellent results through up-scaling and can greatly reduce rendering time and final file sizes. Ultimately, your choices will be made based on many variables, such as the distance of the audience from the display, the type of audience (moving or stationary) and the need for brand color integrity.

Is there a device in between my digital signage player and the MicroTiles that manages the content source?

6

Yes. The MicroTiles External Control Unit (or ECU) delivers content to the tiles while providing system-level control and auto-calibration and monitoring the overall display. The units are simple, small and affordable and are compatible with all standard graphic formats, playback devices and mainstream creative and digital signage software platforms. To play video or data on a MicroTiles display, operators simply connect a PC or other media player to the ECU using the provided single-link DVI connection. The ECUs work together to balance color and brightness automatically, with sensors in each tile steadily monitoring the performance of each light engine, independently, and reporting this information back to the ECU every few seconds.

My MicroTiles display will be viewable in an area with bright ambient light. What can I do to overcome the lighting in terms of color choices and other elements?

7

MicroTiles perform well even in bright ambient lighting conditions if content designers adhere to high standards in production. That means using high-resolution files, our recommended encoding techniques and saturated colors that push through the available light. A well-documented phenomenon, called the Helmholtz-Kohlrausch (or HK) Effect, shows humans respond much more to deep, saturated colors than to dull, washed-out colors. MicroTiles are engineered to present a much broader color spectrum than conventional displays, and the subjective effect is that these purer colors are punchier and more vivid. In darker settings, the impact is even greater.

I'd like to integrate interactivity into my project. How can I do that with the MicroTiles?

8

MicroTiles support interactive elements, and, while that level of engagement is not critical to a project, in the right context it is a tremendous way to make the most of your investment and opportunity. Touch overlays are not integrated directly into the face of the tiles, but interactivity is nonetheless entirely possible and has been extensively tested and demonstrated. Sensors and cameras enable compelling gesture-based interactivity, from content that responds to general physical motions to navigation that requires precise touches. MicroTiles can also respond to commands using mobile technology. In both cases, peripheral devices and applications are readily available to drive the desired usage.

What are the recommended video encoding tools? What bitrates should be used?

9

Numerous video compression software applications provide satisfactory results for encoding completed full-motion creative. Among those we have used: Compressor, Sorenson Squeeze, Autodesk Cleaner, Adobe Media Encoder, MainConcept Reference, Episode Pro and Quicktime. Bitrate selection is a variable that depends on either the hardware setup of the playback device (such as CPU power, RAM and graphics cards) or the technical approach for the content (will the material be played at native resolution or scaled?). Testing before deploying MicroTiles content is advised to ensure the best results. Produce some very high-resolution content to ensure the hardware will be able to play back video that has a specific resolution and bitrate, and then adjust those parameters until you see the results you want. For reference, a 1080p HD movie clip, encoded in h.264 at 30fps and a bitrate of 18,000Kbps, will play very well even on a simple Mac Mini computer.

What special considerations are there for working with odd-shaped content?

10

The baseline consideration is ensuring that you define what your needs will be and that you have the software and playback hardware that will deliver on those needs. It is important to respect the shape of your display and work with it. Unconventional shapes introduce the opportunity to do unconventional things with the content and use creative concepts that are totally related to the shape. Shapes and odd aspect ratios also require technical planning and testing. Graphics cards need to be compatible with the desired resolution, and, while most of the latest Matrox, Nvidia or ATI cards on the market have the flexibility, do not assume they will cooperate and work properly. In some special cases, third-party software for resolution management is necessary for creating the desired results. We have used SwitchResX for Macs and PowerStrip for PCs for managing these uncommon resolutions.

How can I keep file sizes manageable without losing quality?

11

Testing has found encoding video as h.264 .mov files retains high-quality visuals but manages to contain file sizes to acceptable levels. Our technical documentation also provides recommended presets for encoding that will help control file size but retain high quality. Choosing not to optimize your encoding will easily result in huge file sizes, playback challenges, storage issues and higher data transfer times and costs.

MicroTiles are very bright when they use color saturation. What are the key things to remember when it comes to use of color, such as color choice, contrast and brightness?

12

Work with the most saturated colors – reds, greens and blues – to get the most compelling results. Pale and half-tone colors will lessen the impact. Color reproduction capability on MicroTiles is a full 115% of the NTSC or PAL color gamut and exceeds what's possible with standard LCD flat panels by more than 50%.

I want to do whatever I can to hide even the hairline seams on the MicroTiles. Are there tricks to do that?

13

The seams are only hairlines and, at 1mm, far smaller than display industry norms. There are, indeed, tricks to make them all but disappear. The first thing to do is design with those tiny gridlines in mind. Try to contain visual elements within one tile or a cluster of tiles, and keep the seams away from the periphery of visual elements (where the seams would be accentuated). Bury the seams into larger vertical and horizontal elements.

What are the considerations for repurposing broadcast and other media files?

14

Your biggest consideration is quality. There is a direct correlation between the quality of the content loaded on the media player and the quality that will be seen on the displays. Material already outputted for broadcast will typically not make the most of what's possible because of lowered resolutions. To get the best results, you will want to secure the source files for whatever you are planning to repurpose for a MicroTiles display.

What rules of thumb are there for size and the amount of text used on a tiled display? Is there a formula that helps optimize them?

15

The simple rule for fonts is to always think about your viewing audience. Where will most of your viewers be when they see the screens, and how long will they be looking? You should use the same creative thinking that applies to well-executed outdoor billboard campaigns. Big visuals and minimal text. Digital displays, and particularly MicroTiles, are meant as visual feasts, not reading platforms. Keep written content short. Ensure it is easily read at the distance where the audience will be. And ensure the fonts are outputted at the native resolution, as they do not respond well to scaling and other manipulation.

Do viewers see content moving across a set of MicroTiles, versus up or down a horizontal stack, differently?

16

Look at your MicroTiles plan as a whole, and develop a storyboard that builds up the activity of your visual elements. The verticals, horizontals and diagonal opportunities presented by a set of MicroTiles should have a sequence of visual events that viewer minds can work with and absorb. Designers can have a lot of fun with the shapes, but they should resist any temptation to introduce visual chaos.

Corporate offices

Christie Digital Systems USA, Inc.
USA – Cypress
ph: 714 236 8610

Christie Digital Systems Canada, Inc.
Canada – Kitchener
ph: 519 744 8005

Independent sales consultant offices

Spain
ph: +34 91 633 9990

Italy
ph: +39 (0) 2 9902 1161

South Africa
ph: +27 (0) 317 671 347

Worldwide offices

United Kingdom
ph: +44 (0) 118 977 8000

Germany
ph: +49 2161 664540

France
ph: +33 (0) 1 41 21 44 04

Eastern Europe and
Russian Federation
ph: +36 (0) 1 47 48 100

United Arab Emirates
ph: +971 (0) 4 299 7575

India
ph: (080) 41468941 – 48

Singapore
ph: +65 6877 8737

China (Shanghai)
ph: +86 21 6278 7708

China (Beijing)
ph: +86 10 6561 0240


Japan (Tokyo)
ph: 81 3 3599 7481

Korea (Seoul)
ph: +82 2 702 1601

Phlatlight LUMINUS



For the most current specification information, please visit christiedigital.com/microtiles

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