

How-To Creating a Ceramic Tile Mural

**Tile murals** manufactured for a church in New Mexico.



### By Ron Manwiller

atoazin

efore we get into the meat of this article, I must first give credit to Michael Beckemeyer, Patrick Hammond and Karen Zwolensky, who are the real pros at producing tile murals here at Enduring Images!

In this article, we will describe how to use digital ceramic printing to create a ceramic tile mural. We will review the enlargement process, slicing the image into a mural, making the decals and decorating and firing the tile. We will also discuss how to choose between the two common decorating technologies-kilnfired digital ceramics and heat-set sublimation—when producing a tile mural.

#### ENLARGING THE GRAPHIC

The art for tile murals may originate from a variety of sources including your customer's photography, individual art work, commercial logos, graphic designs and others. Whatever the source, it will fall into one of two digital graphic formats: vector or raster.

The simplest situation, by far, is starting with a vector graphic. Many corporate logos and most text are created as vector graphics, because they are simple and contain less image detail than photographs. If you have such an image then the task of enlarging the graphic to full mural size is a simple mouse click in Adobe Illustrator



or similar vector graphics program. The reason for this is that vector graphics use mathematical equations to represent the image. As a result, vector images can be enlarged infinitely with no loss of resolution, an ideal situation for producing large, high-resolution murals. Enlarging raster images is not quite as simple.

One of the great appeals of custom tile murals is that customers can use their personal photographs or art for murals that can last for many generations. Unfortunately, photographs are almost always raster images because they contain enormous amounts of image information and therefore cannot be mathematically rendered successfully. Raster images are made up of a series of dots or bits of image information called pixels. Raster graphics may require millions or billions of pixels to adequately reproduce the graphic. Enlarging such an image is not as easy

## How-To



Figure 3



Figure 4



Figure 5



Figure 6

as a simple mouse click. That approach will increase the distance between the pixels, and the graphic quickly becomes grainy and loses resolution. You may be familiar with a similar effect when trying to enlarge an analog photograph—the larger it becomes, the fuzzier it looks.

The best solution to this challenge is to have your customer provide the digital graphic at full mural size at the desired resolution. 300dpi is sufficient. This accomplishes one important objective: your customer will provide the image at a quality acceptable to them. If they want you to do the enlargement, then it falls on you to decide if you will do that work gratis or charge for it. At Enduring Images that decision is driven primarily by the size of the final mural.

There are many software programs designed specifically to enlarge raster images with minimal loss of fidelity. A Google search will surface them. More often than not, we use Adobe Photoshop (PS) to enlarge the graphic. But again, if the enlargement is going to be 50X or greater, consider a program specifically designed to enlarge raster graphics. In addition to Photoshop, we have used Fractal Magic and Photozoom Pro. Each



Figure 7

program has its pros and cons, so download the trial version and see which one(s) you like. Both of these programs and most of the others you will find on Google are Photoshop plug-ins and work seamlessly with Photoshop. For 50x+ enlargements, better results can be obtained by enlarging the graphic in 10% increments, allowing the software to fill in the space between pixels a little at a time. With the right program, patience and attention to detail, even raster images can be enlarged to extreme size with beautiful results.

Finally, whenever we make a large mural, we are careful to insure that the customer has a clear understanding of the final product. Because of the variability of computer screens, we often ask the customer to print and mail a copy of the artwork that we use as a "color target." We then send them one or two tiles printed and fired at full scale as a final proof. It is cheap insurance.

# PREPARING THE GRAPHICS FOR PRINTING

Once enlarged, the graphic must be sliced into the correct tile size. To do this, select the slice tool in Photoshop, which is nested under the crop tool. (See Figure



Figure 8

1) Divide the image according to the customer's specs. A graphic that is 24"x36" can be divided evenly into 6"x 6" tiles but not evenly into 8" x 8" tiles. I know it sounds trivial, but it's surprising how many customers will ask for a tile size that doesn't fit the requested mural geometry. Once the image is divided, you can create individual layers for each sliced piece using the marquee tool. Set the marquee tool to the appropriate size and place the selection over the desired slice. Next, click the create new layer icon or press control/ command and the J key. After creating your new layers, align them so that they are all in the center of the page. Resize your document for printing. Be sure to label each layer (See Figures 2 and 3) and each printed page according to its position in the mural. This is done to ensure that there will be no confusion as to how the mural is put together at the job site. Forgetting this last step is certain disaster. Yes, we have learned this the hard way!

### MAKING THE DECAL

Decals have three components: water slide decal paper, the ceramic toner which is printed onto the water slide decal paper, and a film of ceramic cover coat or glaze which serves a variety of purposes including transferring the image (See Figure 4). Think back to applying decals to models you made as a kid. The cover coat is the film that carries the graphic off the paper and onto the model. Printing the tile image takes little more than sending the print job to the printer in much the same way as you would print any graphic. Once printed, the ceramic cover coat is applied by placing a piece of lamination paper on top of the print and sending it through a standard pouch laminator (See Figures 5, 6 and 7). In the laminator, the ceramic cover coat releases from the carrier paper and transfers to the printed decal paper to complete production of the decal (See Figure 8). Clean, simple and efficient. One of the great advantages of our ceramic printing system is that it eliminates the use of all organic solvents-no sprays, no VOC's or glaze particles in the air, no screens to clean up afterwards, no naphtha, no MEK, no acetone. The only liquid used is water. There are a variety of alternative ways of applying ceramic cover coat to the printed water slide decal paper, but I don't recommend that you do any of them in-house. The materials required are quite toxic, so leave this job to professional screen printers who have the facilities to manage it safely.

## THEY DON'T CALL IT WATER SLIDE FOR NOTHING

Now that you have produced the decals-decal paper, printed image, ceramic cover coat-the decorating process is simple. Dip the decal into water and after a few seconds the water penetrates through the back of the paper. Once the water reaches the release coating on the decal paper, slide it onto the tile, thus transferring the image and the ceramic cover coat (See Figure 9). To remove the air and water from under the decal, use a squeegee and roller (See Figures 10 and 11). Then, at the end of the day, load the tiles into the kiln (See Figure 12), fire overnight, and the next day it's almost like Christmas.

### WHEN TO USE WHAT

A tile mural requires the production of uniquely decorated tiles, each one a small piece of the starting graphic. Because each tile in the mural is unique, mass-produc-

## How-To



Figure 9



#### Figure 11



Figure 10



Figure 12

tion printing processes are economically unsuitable. One great advantage of digital technologies is that they enable low production cost at low volume. There are two dominant options: heat-set sublimation and kiln-fired digital ceramic.

The choice between heat-set sublimation and kiln-fired digital ceramic decorations is dictated by the end use of the tile and the resulting durability requirements of the installation. Ceramics are often the materials of choice in end uses where extreme durability is demanded, like the heat shield on the Space Shuttle. There are no plastic materials, such as sublimation coatings, capable of such performance. If the tile mural being produced will be installed in any location demanding the durability of commercial ceramic tile, then there is little reason to look beyond kilnfired digital ceramic decorated tile. I've included photos that depict a few of the six murals we manufactured for a church in New Mexico. The tiles we made for this installation will last many hundreds of years in the New Mexico sun. Sublimation decorated tile would not survive in this application.

Sublimation has been around longer than digital ceramic printing and is a more widely used decorating technology than digital ceramics. It was the second technology used to make tile murals. The first was a now obsolete film process commercialized by the DuPont<sup>®</sup> Company as Cromalin Art<sup>®</sup>. Because Cromalin Art<sup>®</sup> film is no longer manufactured, it will not be discussed here.

Sublimation is a chemical term for a material that undergoes the change from

solid to vapor without going through a liquid phase. The inks are not made of ceramic pigments (ceramic pigments don't sublime) but instead rely on a plastic coating on the ceramic tile to function as an ink receptive layer for the printed sublimation ink which is heat set at around 400 degrees Fahrenheit. By contrast, ceramic decorations are kiln fired to 1600 degrees Fahrenheit or, in the case of some floor tile using in-glaze toners, 2000+ degrees Fahrenheit. Even with the durability compromises of sublimation decorations on tile, this technology created the tile mural industry we know today. The high level of market interest in tile murals made using personal art is a growing business opportunity.

In end uses where the tile will not be subjected to sunlight or normal wear and tear, sublimation can be an excellent choice of decorating technology. Sublimation decorations have the advantage of optically mimicking a conventionally printed inkjet image better than a digitally printed ceramic pigment image. But it must be kept in mind that, like any conventional print, a sublimation decoration is "alive". It degrades more or less continuously over time. The rate of degradation is dependent upon the wear it receives and the amount of UV exposure it gets. Whether this change to the image will be noticeable or worrisome depends entirely on where the tile is installed. Sublimation is a marvelous decorating technology and can do many things not possible with digital ceramic pigments. It is unsurpassed in its usefulness on a variety of other materials such as polyester T-shirts. Likewise, digital ceramic printing can do many things not possible with sublimation and is unsurpassed in its ability to permanently decorate ceramic

products of all kinds. Each technology has its appropriate application, and both are excellent when used appropriately.

### CLOSE

It should be noted that our company, Enduring Images, is a contract manufacturer of custom food safe tableware, memorial porcelain portraits and custom tile murals using kiln-fired digital ceramic printing technology. We also sell the digital ceramic printing system which we use in our manufacturing. We do not use sublimation. So you, as the reader, will have to filter any obvious bias.

My advice to anyone confused by the claims of any sales person is simple: don't believe anything you can't independently verify. The Tile Council of North America (TCNA) is a tile industry trade organization that establishes performance specifications for tile in commercial end uses. UV stability as well as durability measures such as Mohs hardness, diamond needle scratch resistance and abrasion resistance can all be measured. If you want to confirm the durability claims of decorations on tile, the TCNA can do that. You can also do some simple testing yourself with a paper clip or key from your key ring, unscientific, perhaps, but illustrative.

It is worth considering the expanding market for custom tile murals as a growth opportunity for your business. It is one of the fastest growing businesses at Enduring Images. I wish you great success with it.

Ron Manwiller is the co-owner of Enduring Images, the North American distribution partner of MZ Toner Technologies, the inventor and patent holder of digital ceramic printing. For more information on any of Enduring Images' products or to purchase a digital ceramic production system, please call 303-278-8868 or email info@enduringimages.com.