Notes on Overglazes

Guide to the use of Lusters and Overglazes
From Duncan Ceramics

How to use Precious Metals
1. Be sure that the surface of your piece is free of dust, skin oils and lotions to ensure proper adhesion. Wipe surfaces with rubbing alcohol prior to applying the overglaze (except when used over crackle glazes).
2. Always apply with a brush that is designated solely for use with the Gold to prevent contamination.
3. Do not stir or shake glaze.
4. Place a small amount of overglaze on a glazed palette. Apply one smooth coat. Do not let the Gold pool in an area; brush it out smoothly.
5. Correct application should produce a Christmas green tint.
6. Clean brush in Essence and let dry.
7. Overglazed ware can be fired while it is still wet. The kiln must be clean, well-ventilated (do not overload) and follow a normal firing schedule. Do not touch wet decoration and handle as little as possible until ware is fired to avoid smudging.
8. Stilt and fire the Gold to shelf cone 019-018.

Tips & Techniques for Precious Metals
1. The appearance of Gold will vary with the type of glaze over which it is applied. When applied over a gloss glaze, Gold will be shiny. When applied over a matte glaze, Gold will be dull.
2. If Gold is accidentally applied on the wrong area, dip a cotton swab in Essence and wipe off misplaced color.
3. If any areas are missed, go back and touch up before Gold dries.
4. If using a metallic overglaze and Mother of Pearl on the same piece, apply and fire the metallic overglaze first.
5. For solid coverage with Gold, apply over a grey glaze or a grey underglaze covered by clear glaze.

How to use Mother-of-Pearl
1. Be sure that the surface of your piece is free of dust, skin oils and lotions to ensure proper adhesion. Wipe surfaces with rubbing alcohol prior to applying the overglaze (except when used over crackle glazes).
2. Always apply with a brush that is designated solely for use with Mother of Pearl to prevent contamination.
3. Do not stir or shake glaze.
4. Place a small amount of overglaze on a glazed palette.
5. For a swirled look, swirl on 1 coat, overlapping strokes.
6. For a smooth look, brush on all strokes in the same direction.
7. Correct application should produce a light blue tint.
8. Clean brush in Essence and let dry.
9. Overglazed ware can be fired while it is still wet. The kiln must be clean, well-ventilated (do not overload) and follow a normal firing schedule. Do not touch wet decoration and handle as little as possible until ware is fired to avoid smudging.
10. Stilt and fire Mother of Pearl to shelf cone 020.

Tips & Techniques for Mother of Pearl
1. The appearance of Mother of Pearl will vary with the type of glaze over which it is applied. When applied over a gloss glaze, Mother of Pearl will add a shiny luster. When applied over a matte glaze, Mother of Pearl will add a dull luster.
2. If Mother of Pearl is accidentally applied on the wrong area, dip a cotton swab in Essence and wipe off misplaced color.
3. If any areas are missed, go back and touch up before Mother of Pearl dries.
4. If using a metallic overglaze and Mother of Pearl on the same piece, apply and fire the metallic overglaze first.

How to Use Essence
1. Swish overglaze brush in solvent until bristles are free of product. Wipe on paper towel.
2. Tips & Techniques for Essence
3. Use a separate bottle of Essence for each overglaze product. Mark the bottles according to which overglaze product was used. Contamination can result if brushes and/or Essence used with one product come in contact with brushes and/or Essence used with another. For example, if you use Bright Gold and clean your brush in one bottle of Essence, then clean a brush used with Mother of Pearl in that same bottle of Essence, contamination will result and compromise all subsequent firings.

THE JOY OF LOW-LOW FIRE
From Garth Johnson

My mission within the ceramics world is to explore the realm of low-low fire work, particularly china painting and decals. For years, I searched for a way to put illustrations on my work, muddling through majolica, stumbling through cone 6, until the solution came to me in the form of a group of china painters in Lincoln, Nebraska. This was a revelation for me, and I focused all of my efforts on learning to paint little African violets on saucers and cups.

WHY CHINA PAINT?
For the uninitiated, china paints are a combination of some sort of flux (traditionally, lead), silica, and a colorant (stains or oxides). China paints generally come pre-mixed, in powder form, and must be ground with a vehicle (usually some form of oil) until they reach a paintable consistency. Then, the china paint can be applied to the ceramic piece, and fired (generally between cone 018 and 016). What this means to you, the ceramic artist, is that you can china paint on any piece of glazed ceramic ware, and the results will be WHAT YOU SEE IS WHAT YOU GET! No more painting on 3 coats of a runny, gray glaze to get blue, simply apply china paint, and fire!

AN IDIOTS…erm...CERAMIC ARTIST’S GUIDE TO CHINA PAINTING
There are as many rules to china painting as there are china painters. Many beginners are paralyzed with fear by all of the dogmas and strictures of the medium, but I have news for you… IT’S NOT ROCKET SCIENCE!!! China painting is simply a great way to put color on ceramic ware. PERIOD! Before you start, you will need some supplies, which can easily be found online through one of the china painting portals on the internet. The truth of the matter is that the members of the china painting community are very web-savvy, and put other ceramic media to shame in their mastery of computers. One of the most comprehensive sites, as of this writing, is http://porcelainpainters.com you can find online lessons, links, and a gallery of china painted work there. The World Organization of China painters website is http://www.theshop.net/wocporg/. Some places to get supplies are Mr. And Mrs. Of Dallas http://www.mrandmrsofdallas.com, Ann Cline, http://anncline.com, and my personal favorite, Rynne China in Detroit http://www.rynnechina.com/, (1-800-468-1987). It should be noted that Rynne carries the highest quality china paints that I am aware of—as used by Kurt Weiser, Matt Nolen, and other discerning china painters worldwide.

SOME SUPPLIES YOU MIGHT NEED...
There are a few essential china painting supplies that you should have. They’ll make your life much easier.
PAPER TOWELS—try to find a lint-free variety such as BRAWNY, or use blue shop towels, which are available at any hardware store.
BABY OIL—You will use the baby oil as a medium. Substitutions can include mineral oil, motor oil, 3-in1 sewing machine oil, or if you’re feeling extravagant, a commercial oil such as Rynne’s "Painting/Mixing Medium".

PALETTE KNIFE–this is a long, flexible version of a painting palette knife, used for mixing the oil with the medium.

GRINDING GLASS—a piece of thick, plate glass, sandblasted on one side to mix the china paint on.

BRUSHES—I recommend nice, natural sable brushes, but anything can be used in a pinch. I’ve used anything from the rattiest acrylic brushes to the finest natural bristle.

RUBBING ALCOHOL—used to clean your piece before painting.

TURPENOID NATURAL—not as non-toxic as the manufacturer would have you believe, but definitely the kindest solvent I’ve run across for brush cleaning. Available at most art supply stores.

LET’S GET STARTED!
Almost any glazed ceramic piece can be china painted. A matte surface will yield a matte finish, while a shiny surface will yield a shiny finish (make sense?).

First, let’s mix the china paint: Take as much powdered china paint as you think you will need (a little goes a looooon way), and put it on your grinding glass. Add the oil, a few drops at a time to the china paint, and use the palette knife to mix the two in a circular, grinding motion. Keep grinding and adding oil until the china paint is smooth, and about the consistency of toothpaste.

Wipe off your glazed piece with some rubbing alcohol applied to a paper towel. This will help take any of the oil, dust, and fingerprints that have accumulated on the surface. You’re ready to paint!

To pick some pigment up on the brush, first dip it in the oil, and squeegee the excess oil out with a fingertip onto the grinding glass. "Wiggle" the brush through your mixed china paint, saturating the brush. Then, simply paint your piece any way that you want to. You can use rough brush strokes, or meticulously, smoothly paint your pieces. China paint’s big advantage is that if you mess up, it can be immediately fixed by wiping the piece off.

It is difficult, nigh impossible to layer colors in a single firing—someone pointed out to me that china painting is akin to painting with butter. After you apply one color, clean your brush in the turpenoid, and repeat the process with the oil for the next color. China paints will always be somewhat translucent, no matter how thick you paint with them, so consider the possibility of doing multiple firings, layering different colors on top of each other with each firing. Again, what you see is what you get. Try mixing the china paints with each other. It will work most of the time, but oranges, yellows, and reds are tough to mix—they might fire out if combined.

Speaking of firing, once you have a piece ready for the first firing, use these guidelines as a general rule of thumb (not an absolute way of life). Blues, browns, greens, and darker colors like to be fired hotter (around cone 16), while reds, oranges, and yellows like to be fired at cone 018 (they contain colorants such as cadmium, that are much more unstable, and will burn out at higher temperatures). Place the piece in a kiln—be sure to prop the lid open during the firing—the colors need oxygen during the firing to retain their brilliance. Fire at a medium speed—the firing speed all depends on what you are firing.

Handmade porcelain tends to crack during fast firings—obey the general guidelines that you would use for other firings. That said, for most of my work I fire like a banshee. I have done cone 016 firings in 6 hours flat, from cool to unloading.

When your piece is out of the kiln, the colors should be smooth and translucent. If they are dull and opaque, they are probably underfired. If they lose their color, they were either applied too thin, or overfired. Don’t fear either of these outcomes—you can always apply more china paint and refire the pieces. If the china paint is flaking off of your piece, chances are, you are putting the china paint on too thick. You are applying what is, in essence, a glass to the surface of your glazed work. It can only hold so much china paint. Your china paint may feel slightly rough to the touch. This can be solved by sanding the piece lightly with a fine-grained wet-dry sandpaper, or better yet, foam sanding pads.

Break the rules! Try anything. I’ve achieved very interesting results by mixing different low-fluxing ceramic materials with the china paint. Of particular interest is lithium carbonate. Some others to try are barium carbonate and nepheline syenite. Be careful working with any of these materials. Much of the china paint being produced today avoids using lead, but there could still be lead or nasty colorants in it. If you get any on your hands, wash them off immediately with soap and water. Never use china paint on a food surface—as lead or other oxides are harmful to the user.
A FINE LINE......
One of the chief advantages of china paint is that it can be used in a crow quill pen for incredibly fine lines. To do this, mix your china paint (Rynne’s Best Black works particularly well) with a thin oil (I’m fond of Rynne’s Outlining Oil) until it is the consistency of ink. In the absence of outlining oil, a time-honored china painting tradition is the use of 7-up instead. The sugar makes the mixed ink tacky and viscous enough to stick onto the piece. Load up a crow-quill pen (found in any art supply store) with the ink, and draw on the piece just like you would with ink on paper. Fire anywhere between cone 016-018.

VIVA, GADGETS!
There are a few nifty gadgets and tools that can be used for china painting. One that I find particularly handy is the "wipe out" tool—the rubber ended texture tool sold in ceramic supply stores. These can also be obtained from Ann Cline and Rynne. Ann Cline also sells an incredibly useful tool (that you can also make yourself!) for lustering. Take an alligator clip (the ones sold in any electronic store) and mount it to the body of a brush with epoxy or another strong glue. You now have a fabulous tool for lustering. Just take a little bit of sponge and clamp it in the jaws of the alligator clip, dip it in the luster, apply the luster, and simply throw the sponge away when you are finished! No more festering brushes, no more acetone or denatured alcohol clean-ups! Rynne also sells a disposable gold-luster pen called the cerama-pen. This pen has a nice felt-tip that can be used for fine lines and decorations. When it runs out, sayanora! Another way to avoid messy brushes altogether.

GARTH’S CONE 018 IMITATION WOOD ASH GLAZE
Simply take any color of china paint (yucky brown if you want, wood-firers!) and grind it with baby oil in a ratio of roughly 3 parts oil to one part china paint, and slather it on a piece. Let it sit for a few minutes, and the oil will begin separating out in rivulets, and running down the piece. Allow the oil to dry as much as possible, and fire the piece. You can now layer any other colors on top of the first and refire. Voila! No wood-stacking or environment-wrecking. Just good clean china-painting fun. Another trick for getting mottled surfaces is spraying an unfired china painted surface with rubbing alcohol. The china paint will flee any spot that the alcohol lands on. You can fill a spray bottle with rubbing alcohol, and simply mist it on any spot that you would like to be runny and mottled.

LASER PRINTER DECAL SECRETS REVEALED!
There are quite a few artists making computer generated and print-generated ceramic art. A good gathering point for this work is: http://www.printandclay.net, which is maintained by artist Les Lawrence. I found out about laser-printing decals when not much was known about them—now there seems to be a bigger body of knowledge out there. Basically, laser printer toner (not laser-jet toner) is composed of tiny little iron filings and tiny beads of plastic. When a laser printer (or Xerox machine) prints an image, it establishes a static field on the piece of paper, then the toner sticks to the field, then goes through a heat element which melts the plastic bits, fixing the toner on the paper. Because the pigment is iron, a ceramic colorant, it can be applied and fired onto a glazed surface, leaving a sepia-colored image behind.
To make a laser decal, you will need a laser printer (not a laser-jet printer—the toner in them doesn’t have any iron), some decal paper, and some clear spray acrylic (Krylon works well, but almost any other brand is fine, too).
Create an image or text on the computer, and format it like you normally would print it out, positive, and right reading (so that text reads correctly). Text and line art tend to print beautifully, but results with photographic work is a bit trickier. You may want to convert photographs to halftone so that there aren’t any vast expanses of dark black.
Make sure that you are using water-slide decal paper. The best place to get it seems to be Highwater Clay in Asheville, North Carolina (Phone: (704) 252-6033). Another source for decal making equipment is Amaco http://www.amaco.com. Cut the decal paper to a size that the printer is capable of printing, and load it into the printer so that the printing goes on the shiny side of the paper.
Now take the spray acrylic and lightly spray the printed decal—wait 5 minutes, and give it another very light coat (if you spray too heavily in the beginning, it will smudge the image). After another five minutes, spray the decal with a very heavy coat of acrylic, when this dries, repeat at least two more times, until there is a very shiny, glossy surface.
Let the decal dry anywhere from an hour to overnight. When it is dry, cut out the image that you want to apply to the glazed surface. Fill a shallow-bottomed pan with warm water and soak the decal for 30 seconds, or until the image and acrylic begin to separate from the decal paper. GENTLY slide the decal on to its final destination, and gently smooth the decal with a sponge, from the center out, eliminating any air bubbles that might have become trapped.

Now, the hard part–firing. There is no one temperature that laser transfers go to because every glaze is different. I've had success with decal firings anywhere from cone 018 to cone 9. Basically, you want to find a temperature where the glaze is just starting to flux. This melts the iron into the glaze, preserving your image. If you fire too hot, the glaze will suck up all of the iron. If you fire too low, the whole thing will just wipe off. Here are some general firing ranges:

- On top of China Paint–Cone 020-018
- On top of low-fire glaze–Cone 06-010
- On top of Cone 6 glaze–Cone 04-Cone 1
- On top of Cone 10 glaze-Cone 1-Cone 6

These are just general rules. You will need to experiment to find the temperature that is right for your glaze. If your transfer appears to burn out at a very low temperature, there is a chance that your toner is formulated with something else besides iron. Every Apple LaserWriter printer that I have come across works, as do most Elite printers. You will, perhaps, have to experiment with a variety of printers to get results.

Another wild card is the glaze itself. Clear glazes and glazes with a lot of gerstley borate and nepheline snyrite in them tend to eat the glaze. I have achieve good results with a variety of glazes, including some matte, high fire ones. Experimentation is key–don’t give up if the process deals you with setbacks. This is all information to combine with the things you know. Mix it up a little! The ceramic universe will expand because of it.

**Litho-type print Technique**

*From Les Lawrence*

The following is information on a laser printer or copy machine print reprint process. It has been called "the poor mans litho process".

**Materials List**

1. Gum water: Either Gum CMC or Gum Arabic. Mix 100 grams per one gallon of hot water, mix well and let sit over night.
2. Image on paper. Must be the result of a photocopy. Regular weight photocopy paper works fine but 24 or 26 pound paper works a little better.
3. Three pans or small buckets for water.
4. At least three small cheap sponges of fine texture.
5. One large fine textured sponge.
6. Two 3 inch brayers (soft).
7. Linseed oil in small bottle so as to add a drop at a time.
8. Vegetable oil.
10. Small sheet of glass for mixing ink.
11. Untextured and smooth formica table top, large formica covered bat or another sheet of glass larger than the images you are using.
12. One sharp plastic putty knife for each color of ink.
13. Rags and paper towels and for clean up.
15. Thin waterproof gloves.
16. Ceramic Glaze Stain or Oxide.

The following ones I have had success with.
Mason Stain # 6371 Dark Teal Blue
Mason Stain # 6600 Best Black
Degusa Stain Red
Degusa Stain Orange
Degusa Stain Yellow
Red Iron Oxide
I have not gotten any green Mason stain to work.

Process
2. Prepare three pans. Gum water clean, Gum water dirty and water.
3. Prepare ink. Using a putty knife, mix stain with linseed oil on a glass surface to a thick yet fluid consistency. Be sure to mix enough pigment to make the ink too thick to flow. Then add just enough oil to make it flow. This insures the highest saturation of color.
4. Clean and moisten a flat smooth surface (formica or glass) and apply photocopy.
5. Moisten photocopy with clean gum water, let set for 30 seconds. Smooth out wrinkles.
6. Flood photocopy with clean gum water.
7. After paper is saturated, (about 1 or 2 minutes) remove excess with clean gum water sponge. Blot with large clean water sponge.
8. Make final addition of oil to ink if necessary. Roll out ink with brayer in two directions perpendicular to each other. Mix ink in this fashion until ink has even small texture and makes a hissing sound when rolled. This is by far the most important step in this process!
9. Roll ink onto brayer and apply ink to photocopy. Do not worry about getting too much ink on the white areas of the photocopy. Be sure your image is heavily inked.
10. Flood paper with gum water from the dirty gum water pan to clean and remove excess ink. You can be fairly vigorous with your cleaning.
11. Blot paper with big sponge using clean water (no gum) to remove excess liquid.
12. Carefully pick up paper. Place on a flat slab. You can use a curved slab if it is curved in only one direction. Otherwise the paper will wrinkle.
13. Blot with clean sponge then press lightly with a clean brayer.
14. Wait 15 minutes before lifting a corner to see if the print has worked. If you are going to build with it right away leave paper in place to avoid getting print dirty. If not, remove paper wait another fifteen minutes and cover with absolutely dry thin plastic.
15. You cannot spray or moisten the print at all or it will run. After bisque firing it is more durable but can smudge if handled to roughly.
16. Remove any paper before bisque. Do not worry if some small bits remains stuck. It will burn off in firing.
17. Clean up all ink, first with vegetable oil then, Simple Green. Pay particular attention to the brayers.

Notes
1. Ink cannot have any additions of clay or you lose viscosity and the ability to transfer.
2. I suspect raw cobalt carbonate and chromium dioxide would work but the danger of heavy metal poisoning through the skin is extremely high. Commercial stains are fritted and far safer.
3. Transfers can be made to wet clay in any state. Bone dry and to a limited extent to bisque works as well.
4. Overlapping can be done successfully on wet clay.
5. A plaster bat cast on glass might be used to print onto then slip poured on top to pick up the image. If the kinks can be worked out of this method you would be able to print text without reversing it first.
6. If you leave the paper in place until it has less water than the clay it will suck the pigment off the clay.

Toner Transfer
From Les Lawrence
Toner Transfer is accomplished by interrupting the print process before the printed image has gone through the printer's heat roller. This leaves the printed image unfused to the paper. The printed image can then be monoprinted to wet clay. Just like any transfer process, the image should be printed in reverse.

**Other Decal Information**
From Justin Rothshank

**Application of Decals:**
Apply the decals on your pieces at least 12 hours before firing.
1. Your work needs to be clean -- no greasy fingerprints or dust.
2. Soak the decal in clean warm water for about 30 seconds -- just when you can start to slide the decal off the paper.
3. As you position the decal on your work, you have a little time to slide it exactly where you want it (you can actually stretch it a tiny amount to make it longer if it is wrapping around an object).
4. Once you have set it in place, take a rubber rib and squeegee out the water and air bubbles (you will be surprised how much is under there). If you don't get the water out, you will get tiny explosions on the surface of the decal during the firing (my description makes it seem way cooler than it really is). The big drawback with any decal is its unwillingness to conform to textured surfaces.

**Decal Firing:**
Standard Firing Schedule:
1. Let your decals dry at least 12 hours before firing. Yes, you can push this time, but be ready for disappointment.
2. Vent the kiln well during the firing -- especially from room temperature up to 1100°F. Poor ventilation can cause a cloudy appearance on the surface of the fired decal.
3. The firing temperature is the same for either type of covercoat.
4. At ECD we fire 200°F per hour to 220°F and hold for 30 minutes.
5. Then 300°F per hour to 500°F and hold for 20 minutes.
6. Lastly we go 400°F per hour till a large cone 017 is touching, and then we soak it for 10-15 minutes. Cone 016 should just barely start bending, with cone 017 already down. Essentially, we fire between a hot cone 017 and a cold cone 016 for optimum results. If you overfire, the reds and oranges start to fade, which causes your image to look bluish. Underfiring can also drastically affect colors, but the firing range isn't too hard to hit. Your particular glaze (or lack of glaze) can also have interesting effects on how the fired decal looks.

Hints:
Sometimes regular water can leave a silhouette mark around decals. In this case, buy distilled water from the store to use in applying the decals.

I have discovered that with certain glazes/clay bodies will dent/crack after being fired several times. I'm still figuring out what causes this, and how to avoid it. However, some things that have worked include slowing the firing process down when doing the decal firing, doing a slower cooling process, reformulating glazes. I haven't found any fantastic resources for this, but this is definitely something to be careful of.

**Online Resources**

Good Resources for Copyright Law and Fair Use explanation:
- [www.umuc.edu/library/copy.shtml](http://www.umuc.edu/library/copy.shtml)
Lusters:
- Duncan Lusters at Big Ceramic Store
- Laguna Lusters at Axner

China Painting:
- Maryland China
- Rynne China
- www.held.co.uk

Decals:
- Bel Decal
- Easy Ceramic Decals (Kansas City)
- Digital Ceramic Decals (New Jersey)
- Ceramic Decal Printing (Georgia)
- eBay
- Harbon Ceramics & Decals
- www.wisescreenprint.com/
- www.artdecalcorp.com
- www.timrg.com/indecal/
- www.olympiadeals.com
- www.instardecals.com
- www.skolldecal.com
Laser-printed Decals
for Ceramic Use
From Linda Arbuckle

Commercial ceramic decals are made from China paint silk-screened onto decal paper, and fired to low temperatures of 022-016. This allows for printing of multiple colors, but requires familiarity with silk-screening and specific materials to do this.

Laser decals use a special decal paper that is heat-set in a laser printer, and takes advantage of the iron used as a toner component for most laser printers. These will be monochrome, iron-colored images. Although industry is developing color digital printing processes, the equipment is expensive at this time. Easy Ceramic Decals, artist Andy Brayman’s business, has closed. Try an internet search for digital ceramic decals.

Regular water-slide decal paper requires the use of a cover-coat, as mentioned below. Newer decal paper made for laser-printing requires no cover-coat and is very easy to use.

Reports are coming in that laser print cartridge manufacturers have changed formulation to be more environmentally friendly. This has lowered the amount of iron, and there are reports that the newer laser toner does not make a fireable decal. If that is the case w/the toner you try, then you'll need to get special high-iron toner cartridges for your printer made for printing checks. Because the check numbers are read magnetically, the toner does still contain the high iron needed for a decal you fire. One company that produces this toner is Ganson Engineering Inc gei@ganson.com 928 854 5000

If you’re making images in Photoshop, it’s suggested that you use 300 dpi, black and white or grayscale for your image.

Online Resources:
Laser decal paper is available from various sources. At school we get ours from:

Bel Inc
6080 NW 84 Avenue

Bel makes this paper for non-fired use, and does not mention firing on their web page last I looked. Paper comes in clear or with a ground that fires translucent white.

Charlie Cummings has started a group on Ning, the social network site online, for the discussion of print and clay. Much interesting work, process images on Charlie’s pages, and conversation: http://
How and why do laser printer decals work?

Black laser printer toner is composed of tiny iron filings, other pigments, and tiny beads of plastic. When a laser printer prints an image, it establishes a static field on the piece of paper, the toner sticks to the field, then the whole thing goes through a heat element which melts the plastic bits, fixing the toner to the paper (in this case, decal paper). When a decal from a printer containing enough iron oxide is applied to a ceramic surface and fired, the iron oxide survives the firing. The resulting image on the ceramic surface is permanent and sepia colored—ranging from tones of brown, to reddish purple or ochre. The exact color depends on the composition of the glaze underneath the decal, and the firing temperature of the decal.

Not all laser printer cartridges contain iron or enough iron to work as a ceramic decal. All Apple black laser printers work, and so do Hewlett Packard black laser printers. Other brands of laser printers may work, but there is no guarantee unless you test them first. Bubble jet, inkjet, and all color printers do NOT work because they don’t contain any or enough iron or other metallic oxides.

How to make the decal

1. Create an image or text directly on the computer, and format it like you normally would print it—positive and right reading (so that the text reads correctly).

OR

Found images and text (from books, magazines, newspapers, or drawn) may be scanned into the computer. The image can be changed or altered in any way you like in Photoshop or another such program. Any image should work, text and line art reproduce beautifully (even old lithographic images).

Arrange smaller images, text, whatever on the page with a small bit of space between images, 1/4” is good. Lots of images can go on the same page that way so you don’t waste decal paper, just like silkscreened decals. Fit them on the page in any orientation, but be sure to leave about 1/2” border at the edge of the page all around.

TIPS: Photographic work can sometimes be tricky. You may want to convert photographs to halftones so that there aren’t any vast expanses of dark black. For any images with large expanses of black, especially from photographic images, it is a good idea to adjust the brightness/contrast about 25%-30% brighter/lighter.

Note: artist Jacqui Rice suggests that the very first step is working with images in Photoshop at 300dpi, grayscale or bitmap. She finds that grayscale is best.

More TIPS: Large images on ceramic tile or other relatively flat surfaces like plates, can be produced from smaller images using a tiling program (such as Adobe Illustrator) to grid the image for each tile.

Book Resources:

Scott, Paul, *Ceramics and Print*

Wandless, Paul, *Image Transfer on Clay: Screen, Relief, Decal & Monoprint Techniques*

Ceramic sculptor Denise Pelletier has done workshops on these processes, and generously offers the information below. Her discussion was from a time when water-slide decal paper required a cover coat. The newer laser paper does not.

Denise Pelletier deepelletier@hotmail.com

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Note: artist Jacqui Rice suggests that the very first step is working with images in photoshop at 300dpi, grayscale or bitmap. She finds that grayscale is best.

More TIPS: Large images on ceramic tile or other relatively flat surfaces like plates, can be produced from smaller images using a tiling program (such as Adobe Illustrator) to grid the image for each tile.
**ALSO:** Remember that any image you print on decal paper is a decal! That means you must take into consideration the fact that a big decal won’t slide onto a complex or curvy surface without wrinkling. So, relatively flat ceramic surfaces work best with larger images, unless you slice, dice cut, and collage them. Experiment!

2. Once your image is completed in the computer, **load the water slide decal paper into the laser printer** so that the printing goes on the SHINY side of the paper. Make sure you cut the paper to a size that the printer is capable of—many printers prefer an 8 1/2” x 11” piece of decal paper to be trimmed slightly-say, an 1/8” less on length and width. Test first and trim if needed. Same goes for 11” x 14” printers.

3. **Print your image** on the decal paper! Print extras if a particular image is important, because sometimes a decal might tear or run when you apply it, so it’s best to have extras.

Almost any glazed object works, also fired burnished terra sigillata and most vitreous slips. (Porous surfaces do not work. Terra-sigged pieces should be fired to at least c/04). Every glaze is different, so students should come with an attitude of testing and experimentation. Computer decals work over varying firing ranges, so the first try is always an experiment to find what temperature will work best with my given glaze. It’s a good idea to have some small glazed test pieces or tiles if you want to experiment. You might also try decals on found glazed objects.

**Transferring the decal to the ceramic surface**

Apply the decals in the same way that you would apply a commercial decal. Keep in mind that computer decals sometimes give you problems if the cover coat isn’t right. If the cover coat is too thin, the image will tear or break apart-if it’s too thick you may have trouble adhering it to your piece or incomplete adhesion (resulting in burning off part of your image) -

1. **Clean the surface** of your piece (where the decal will go) with alcohol and a clean cloth.
2. **Cut out your image** as close to the edges as possible. Try to make curved rather than angled comers and edges. Sharp edges can cause the decal to lift up.
3. **Fill a shallow bottomed pan or tray with warm water. Soak the decal** for 30-60 seconds, or until the cover coat and image begin to separate from the paper. (Sometimes the paper will curl and flatten out again)
4. **Moisten the ceramic surface** where the decal will go with a wet sponge. This helps you position your decal without wrinkling or tearing it.
5. **GENTLY slide the decal** into position on your piece, carefully smoothing it from the center outward, with a small sponge, soft rubber rib, or rubber brayer. This forces all the water and air bubbles out from beneath the decal. Check to make sure there are no air bubbles or edges that won't stick. If the decal is not in complete contact with the surface, it will disappear in the firing. If you need to reposition the decal, flood it with a little water first.
6. Let the decal dry overnight.

**Firing the decal**

The firing temperature for computer decals is quite variable, and depends on the glaze that the decal is on. Since every glaze is different, you must experiment to know what the optimum firing temperature will be for any given glaze. Success can be had from c/018 (maybe lower) all the way to c/9. Basically you should try to fire at the temperature where the glaze is just beginning to flux. This melts the iron into the glaze, preserving the image. If you fire too hot, the glaze will suck up all of the iron or distort your image. If you fire too low, the image will smudge or wipe off. These are some general firing ranges:

On china paint: c020 - c/018
On low-fire glaze: c/010-c/06
On cone 6 glaze: c/04 - c/1
On cone 10 glaze: c/04 - c/6
On terra sigillata: fire at least to c/04, preferably a bit higher on burnished sigillata only

Make sure decals are stacked in the kiln with at least 2” of clearance between shelves. Fire slowly, especially in the beginning to allow cover coat to bum off without lifting the decal or causing incomplete bumoff of cover coat. The kiln lid should be cracked until the cover coat is completely burned off. I like to leave the kiln cracked right through red heat

EXPERIMENT! You will need to find the temperature that is right for your glaze. If your image burns out at a low temperature, your toner may not have any or enough iron. Firing hotter or cooler or a long firing time than your determined temperature will give you different colors or shades of iron.

Clear glazes w/high Gerstley borate or nepheline syenite tend to "eat" the image. Try firing the decal lower or omit that glaze! And remember, if what you need is a consistent, undistorted image, it is easier to succeed with glazes c/6 or above. [NOTE: at UF we found that lowfire works well if the glaze is stable – like majolica. Highly alkaline glazes, like Alkaline Turquoise (a.k.a. Water Blue) eats the glaze at expected temperatures, but will work much lower.]