

Image and Clay - Michael T Schmidt (<http://www.michaelttschmidt.com>)

Resources:

Web >

<http://www.easyceramicdecals.com>

<http://beldecal.com>

<http://www.printandclay.net>

<http://www.printandclay.net/printandclay/viewpointtext.htm> (links to books, artist, and more)

Publications >

Ceramics and Print - Paul Scott.

Image Transfer on Clay - Lark Book - Paul Andrew Wandless

Artists >

Richard Burkett

Howard Kottler

Richard Shaw

Victor Spinski

Andy Brayman

Mark Burleson

Michael T Schmidt

Kathy King (GA State Univ)

Les Lawrence

Paul Scott

Scott Rench (<http://www.yosoh.com>)

Joseph Pintz

Jim Koudelka

Frank James Fischer & Many More...

Laser Print Transfers: (*Laser Printer Tech info:* http://en.wikipedia.org/wiki/Laser_printer)

There are many ways to put an image on clay. Laser print transfers and decals are just one of the many possibilities. Laser toner is a "complex chemical cocktail," basically it contains Black Iron Oxide and in some cases, Manganese, along with some variety of plastic or polymer. More detail below...

Toner Basics: (<http://home.howstuffworks.com/laser-printer.htm>)

One of the most distinctive things about a laser printer (or photocopier) is the toner. It's such a strange concept for the paper to grab the "ink" rather than the printer applying it. And it's even stranger that the "ink" isn't really ink at all. So what is toner? The short answer is: It's an electrically-charged powder with two main ingredients: **pigment** and **plastic**.

The role of the pigment is fairly obvious -- it provides the coloring (black, in a monochrome printer) that fills in the text and images. This pigment is blended into plastic particles, so the toner will melt when it passes through the heat of the fuser. This quality gives toner a number of advantages over liquid ink. Chiefly, it firmly binds to the fibers in almost any type of paper, which means the text won't smudge or bleed easily- Fixing the toner to the paper.

The pigment in the toner contains iron, which acts similar when used in a slip, glaze or as a wash; when fired creates a sepia toned image, this color can range from a deep red to dark brown, depending on variables such as: Firing Temperature, Oxidation/Reduction, Firing Atmosphere (ie Soda, Salt, Wood), Clay Body, Type/Brand of Laser Printer, quality of image transferred, etc...

Image: Printing on Standard Paper

Prepare your image so that the image is reversed (backwards) on the page when you print it. If the image has a lot of gray tones you may need to adjust the brightness and contrast so the image is darker, (more toner on the paper). You can also experiment with halftone dot patterns (<http://en.wikipedia.org/wiki/Halftone>) similar to how a newspaper is printed. The best example would be the comics, they illustrate a "**Benday Dot** or **Moiré Pattern.**" Adobe Photoshop or a similar software program will easily manipulate your image.

The printer that you choose may affect your image when transferred, I use an HP Laser 5000, it works well, again, experimentation before committing to a large quantity of work is key.

Transferring the Image:

As with everything there is no 1 perfect solution to getting the image from the paper to the clay. There are a variety of chemicals that will do the trick. Listed below are a few chemicals that work well, although they are fairly toxic and should be used with caution: **see <http://www.osha.gov> & <http://en.wikipedia.org> for all sorts of health/safety info related to these chemicals.

- **Xylene**
- **Acetone**
- **Goof Off**

- Wintergreen Oil (this is non-toxic and often found in lotion, perfume, etc)
Wintergreen oil can be found at some drug stores and health food stores.
It is more expensive, and works much slower than the other chemicals.

Safety:

When using these chemicals, read the warning labels, wear appropriate clothing, eye protection (goggles) and chemical approved gloves. I recommend wearing a chemical respirator. Work outdoors, or in an open, well ventilated area. Do not have food or drinks in the area while you work.

Back to the Image: Technique 1

Cut out the image, leave a border or space around that area that you want to transfer. Tape the image face down (toner side touching the clay). Apply your chemical of choice, liberally, but do not cause puddles on the paper (practice is key)...

Next, depending on the heat, humidity, air movement, full moon or high tide, wait 3-15 seconds. Then rub the back of the paper, gently, and the image should release. Carefully, peel the image/paper/tape off of the clay and you should have an image on your clay. If there are poorly transferred areas, try more pressure while rubbing, or apply more chemical and re-rub.

*I recommend practicing on Cardboard, it absorbs the chemical similar to the way bisque-ware does.

This process works on Leather-hard clay, Bisque-ware, on top of some freshly glazed surface (right after glazing the piece and when dry, prior to glaze firing, ie Shino) it also works on finished glazed surfaces as well, although transferring the image to a high gloss, no-porous surface can be difficult. Your piece is now ready to dry, then fire - Bisque, Soda, Cone 10, etc...

Back to the Image: Technique 2

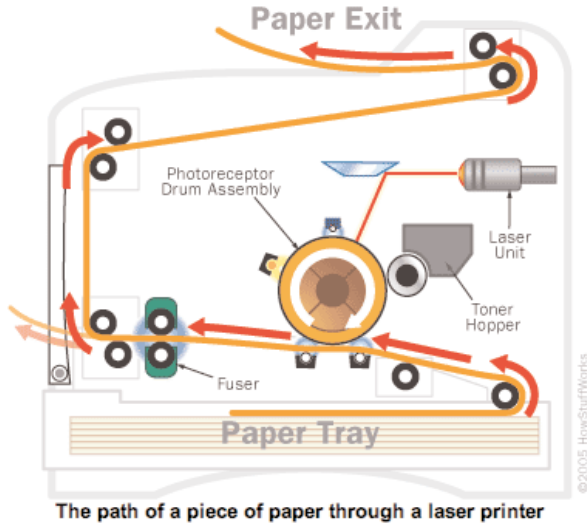
Cut out the image, leave a border or space around that area that you want to transfer. Apply tape to the edges of the paper. Hold the paper, or temporarily tape it to something so that the image (toner) does not touch anything, like the edge of a table. Apply a generous amount of chemical to the back of the paper, again, wait 3-15 seconds, you may recoat if you desire.

If you look at the toner side of the paper, the image (toner) should appear wet, and ready to release. Carefully apply your image to the surface and rub gently to release the image.

Again, this process works on Leather-hard clay, Bisque-ware, on top of some freshly glazed surface (right after glazing the piece and when dry, prior to glaze firing, ie Shino) it also works on finished glazed surfaces as well, although transferring the image to a high gloss, no-porous surface can be difficult. Your piece is now ready to dry, then fire - Bisque, Soda, Cone 10, etc...

The Basics: Static Electricity

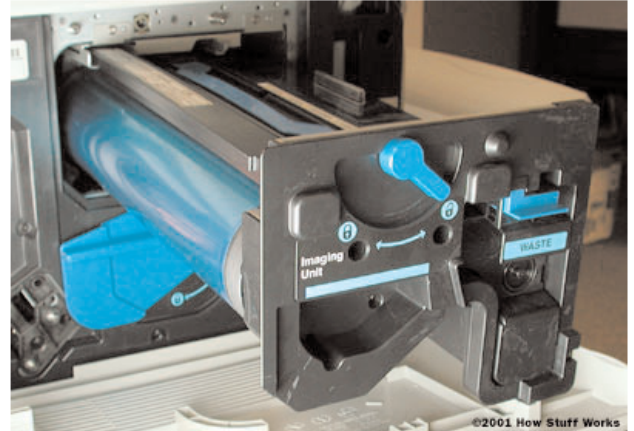
The primary principle at work in a laser printer is **static electricity**, the same energy that makes clothes in the **dryer** stick together or a **lightning bolt** travel from a thundercloud to the ground. Static electricity is simply an electrical charge built up on an **insulated object**, such as a balloon or your body. Since oppositely charged **atoms** are attracted to each other, objects with opposite static electricity fields cling together.



The path of a piece of paper through a laser printer

The Basics: Drum

Initially, the drum is given a total **positive charge** by the **charge corona wire**, a wire with an electrical current running through it. (Some printers use a **charged roller** instead of a corona wire, but the principle is the same.) As the drum revolves, the printer shines a tiny laser beam across the surface to discharge certain points. In this way, the laser "draws" the letters and images to be printed as a pattern of electrical charges -- an **electrostatic image**. The system can also work with the charges reversed -- that is, a positive electrostatic image on a negative background.

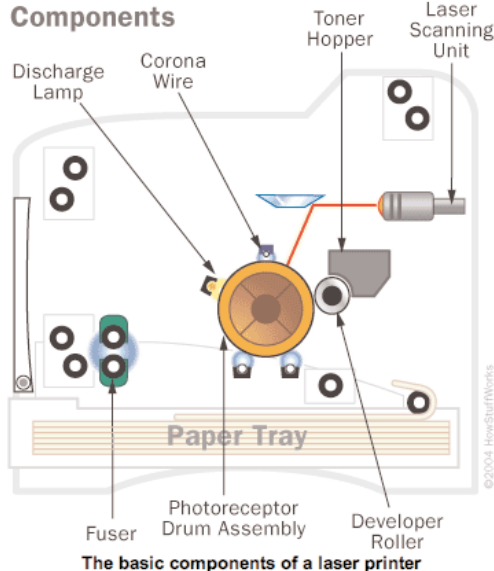


The laser "writes" on a photoconductive revolving drum.

After the pattern is set, the printer coats the drum with positively charged **toner** -- a fine, black powder. Since it has a positive charge, the toner clings to the negative discharged areas of the drum, but not to the positively charged "background." This is something like writing on a soda can with glue and then rolling it over some flour: The flour only sticks to the glue-coated part of the can, so you end up with a message written in powder.

With the powder pattern affixed, the drum rolls over a sheet of paper, which is moving along a belt below. Before the paper rolls under the drum, it is given a negative charge by the **transfer corona wire** (charged roller). This charge is stronger than the negative charge of the electrostatic image, so the paper can pull the toner powder away. Since it is moving at the same speed as the drum, the paper picks up the image pattern exactly. To keep the paper from clinging to the drum, it is discharged by the **detac corona wire** immediately after picking up the toner.

Basic Laser Printer Components



The basic components of a laser printer

The laser assembly moves in only one plane, horizontally. After each horizontal scan, the printer moves the photoreceptor drum up a notch so the laser assembly can draw the next line. A small **print-engine computer** synchronizes all of this perfectly, even at dizzying speeds.

Some laser printers use a strip of **light emitting diodes (LEDs)** to write the page image, instead of a single laser. Each dot position has its own dedicated light, which means the printer has one set print resolution. These systems cost less to manufacture than true laser assemblies, but they produce inferior results. Typically, you'll only find them in less expensive printers.

Photocopiers

Laser printers work the same basic way as **photocopiers**, with a few significant differences. The most obvious difference is the source of the image: A photocopier scans an image by reflecting a bright light off of it, while a laser printer receives the image in digital form.

Another major difference is how the electrostatic image is created. When a photocopier bounces light off a piece of paper, the light reflects back onto the photoreceptor from the white areas but is absorbed by the dark areas. In this process, the "background" is discharged, while the electrostatic image retains a positive charge. This method is called "write-white."

In most laser printers, the process is reversed: The laser discharges the lines of the electrostatic image and leaves the background positively charged. In a printer, this "write-black" system is easier to implement than a "write-white" system, and it generally produces better results.

**** Alternative Ways to Transfer Images to Clay ****

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.

Computer Image **Laser Printer**

Stop The Print **Experimenting With The Print** **Heat Set Page Right • Not Heat Set Left**

Removing Toner Cartridge **Pressing Paper Into Clay Slab** **Removing Paper**

<http://www.printandclay.net>

When using decal paper print the image on the glossy side of the paper, Tape the image down (it tends to curl when sprayed) spray several light coats of lacquer or acrylic spray on the image, let dry 1hr to over night.

Soak in water, the image should release from the paper, slide onto your clay surface, gently smooth the decal from the center out, eliminating air bubbles (use a sponge)

Let dry thoroughly, and fire. There is no one set temperature to fire to, experiment on a variety of clays and glazed surfaces to find out what works for you.

Unfired • Under Fired • Correct Fire • Over Fired