

Lithography

Positive Working Photo Litho Plates



Test plate exposed with a drawing on matte polyester film.

Hand Drawn Images

Drawings created on transparent or semi-transparent materials will work provided that the drawing materials themselves are opaque enough to block the ultraviolet light that exposes the litho plate. The following is a list of materials that will work well:

Drawing Materials

Substrate: Matte Polyester Film (Frosted Mylar), Textured Polyester Film (Velvet Tone Film), or other Transparent or Translucent Film.

Materials: Stabilo Pencils, Litho Crayons, Micron Pens, Technical Pens, Ebony Graphite Pencils, India Ink, Gouache, Acrylic Paint, Photocopier Toner mixed with water and small amount of matte medium and a drop of soap.

You can work naturally on the polyester films since they are quite sturdy, and make deletions using erasers, X-acto knives, and water or solvent depending on the drawing material. If you will use water based media on the film, you may need to clean it first to remove oils on the film that would repel materials like india ink. Rubbing alcohol will work on Velvet Tone film, but may effect some matte polyester films.

You will also need to work at a light table when creating your drawing. It is only when you see your drawing on a light table, that you will accurately see how your drawing will expose to the plate.

Exposure Times

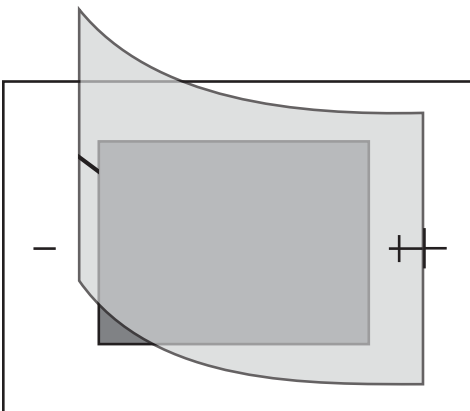
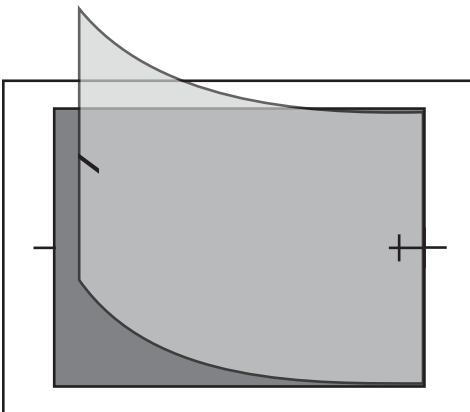
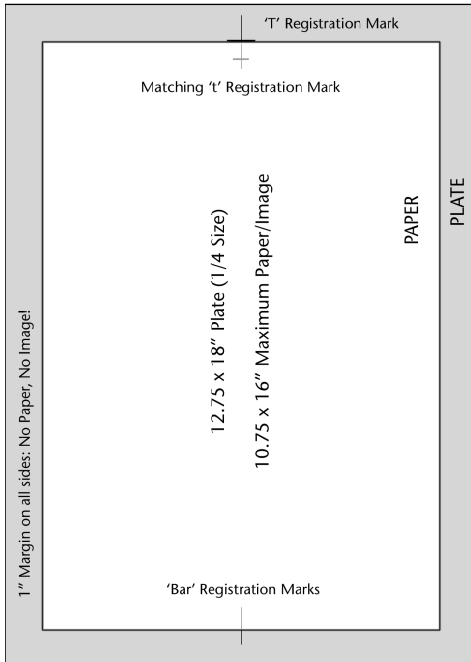
In theory, you want the shortest exposure possible, while still exposing the plate long enough that the non-image areas of the plate develop away cleanly or only leave a very faint haze. When testing translucent materials, it is easy to determine the correct exposure by making several test plates in small increments, and finding when the fog or haze left on the plate by the translucent film fully disappears during developing.

Approximate Exposure Times for the Amergraph 150

.003 Matte Polyester Film:	22-26 light units
Velvet Tone Textured Film:	24-28 lu
Pictorico OHP Inkjet Transparencies:	28 lu
Oiled Paper:	68 lu

Registration

T and Bar registration is a very accurate method for aligning multiple plates. The illustrations show some common measurements for margins and setting up registration for a bleed-format print, and a window-format print.



Exposing & Developing Your Plates

1. Position your film *face down* in the center of the plate and adhere it with small pieces of Scotch Tape.
2. Turn on the exposure unit and set the desired exposure time.
3. Place your plate *face down* on the glass in the center of the exposure unit.
4. Close the top and start the exposure.
5. When the exposure is complete, take out your plate and put it in a developing tray. Pour a generous amount of developer onto your plate and quickly begin working the developer across the plate. Make sure you develop the edges of the plate completely. Development should take about 1 – 2 minutes.
6. Take the plate to the washout booth and rinse both sides of plate well with water. Squeegee off the excess water, and then wipe the plate with a wrung out sponge so there is only a thin even layer of water on the plate. Fan your plate dry.
7. At the press, with the vent turned on, clean up any spots on the margins of the plate with acetone and a Q-Tip or cotton pad.
8. Sponge a thin layer of water on the plate and shake up the Finisher/Cleaner/Preserver. Apply a thin layer of the FCP to the plate with a sponge at the press with the vent turned on. Smooth down with the sponge and allow to dry.

You are now ready to mix your ink, prepare your paper and begin printing!

Printing

Prepare Paper and Newsprint

Tear down your paper to the size you need, which *must be smaller* than the plate. Use a 3-H pencil to make 'T & Bar' marks on the back of your paper. You should prepare as many sheets of newsprint as you have paper plus at least 4 extras. The newsprint should be larger than your printing paper.

Setup the Press for Printing

Center your plate on the plate block by sliding the plate around with a little water underneath to get it to suction to the plate block. Install a scraper bar that is narrower than your plate but wider or equal to the width of your paper.

Grease your tympan, set the pressure to medium-light and mark your starting and stopping points. Be certain that the scraper bar will not start before the edge of the plate or run off the end of the plate.

Get two bowls, one with about 1 liter cold water + 1/2oz Glycerin and 1/2oz Gum Arabic. The other bowl should be empty and is used to discard dirty water. Lay your paper and newsprint in two separate piles on the table next to the press.

Mixing Ink

If you are just printing black, a 50/50 mixture of Litho Black 1796 and Crayon Black Litho Ink will work well. If you are mixing a color ink, be sure to modify it with mag and/or body gum as needed so the ink holds its shape rather than relaxing into a puddle. Lay out a small bead of ink and roll-out your ink. Start with very little ink, or what is referred to as a 'lean slab', and add ink as needed while proofing. The surface of the ink on the slab should be satin in appearance and make a soft sizzle noise.

Printing

Rinse the plate well with water. Immediately begin inking your image by alternating inking, charging your roller, and sponging. Pull a proof after 2 or 3 passes. Pull at least two proofs before switching to proofing paper or good printing paper to allow the image to take ink fully.

The two most important things to control are the amount of water on the plate and how much ink you apply. Keep a very thin, streak free film of water on the plate when inking. Carefully count the number of passes of ink you make. Do not over-ink your plate. Water control is critical with photo plates and if not kept even can cause inconsistencies between prints. Photo plates also require quick rolling, and you may only be able to roll back and forth across the plate 2 or 3 times, before it begins to become too dry.

Before printing on good paper for the first time, add ink. You can control print quality through consistent inking and using only as much as needed. Pressure should be fixed, but if you have added ink several times and the image remains 'salty' or light, increase the pressure. You should always have enough ink on your roller and slab to print the image in about 3-4 passes. Add ink as needed according to this rule. If your image is printing very dark, and filling-in in dark tonal areas, or the ink on the paper looks very heavy and glistens, you most likely have too much ink on your slab. You should Scrape 1/2 the ink off the slab, roll out the roller and print one newsprint without inking your image to strip the excess ink from the plate before continuing.

Color inks will need to be modified by adding magnesium carbonate and body gum. Body gum, although similar in appearance to an oil varnish, does not contain any grease, which can cause problems for photo plates. The

color inks that we use, manufactured by Hanco, contain little or no grease. Your ink should not instantly relax into a puddle when it is properly modified and it should provide some resistance when mixing and hold its shape longer when resting on the slab. Inks that consist primarily of transparent base can create problems such as roller marks and sponging streaks. Working with a mixture of white and transparent base rather than the transparent base alone, will help alleviate this problem. Fine pore sponges with rounded corners, and adding glycerin and gum to the sponging water can also help with these types of problems.

If your ink is tinting-out, where the ink bleeds across the plate and contaminates your sponges, or appears to bloom after inking, your ink requires mag and a heavy varnish such as #8 or Body Gum.

Clean Up



Saving Your Plate

Once you are finished printing you may save the plate to work with later by cleaning it down with the Finisher/Cleaner/Preserver. If you don't want to save your plate, fold it in half and put it with the other plates to be recycled.

1. Put on gloves and turn on the vent.
2. Apply a liberal amount of water to the plate, and then a small amount of mineral spirits in the middle of the plate. Use a rag to wipe the ink from the plate while it remains wet.
3. Rinse the plate off with water and a rag.
4. Apply a thin layer of gum that has been diluted with a little water. Sponge down and dry.

Cleaning up the Ink Slab and Roller

1. Put on your gloves!
2. Scrape up the ink on the slab with a razor scraper and discard it on a phone book page.
3. Roll the excess ink off the roller onto the slab and scrape it up. Repeat.
4. Pour vegetable oil on the roller while it is resting on the slab. Spin it around and work the oil over the slab.
5. Wipe up the excess vegetable oil and ink from the roller and slab. Use the oily rag to clean down ink knives and razor scrapers.
6. Clean the glass slab and ink knives with Simple Green until they sparkle!
7. Turn on the Vent!
8. WIPE THE ROLLER DOWN WITH MINERAL SPIRITS AND A CLEAN RAG! ALL INK MUST BE GONE!
PUT THE RAGS IN THE RED SAFETY CANS!

Cleaning the Press Bed

Simple green will usually clean most everything off the press bed. If not, use an old sponge, water, and powdered cleanser.

Thank you for leaving the studio clean and tidy for the next person!

Photo/Digital Images from Laser Printers

Although limited in size, laser printers are excellent for creating films and separations to be used with a variety of printmaking processes. Laser printers create the illusion of a continuous tone image with varying sized halftone dots, measured in Lines Per Inch (lpi). By default most black & white laser printers will print images at a much higher lpi than can be used for hand printing. If the lpi is lowered it will be easier to maintain a balance between the amount of ink that is needed to print the photo litho plate, and the space around the dots that is needed to hold water and repel the ink. To adjust the lpi of an image you are printing to a laser printer, you will need to place the Photoshop file in InDesign, which can control the halftone screening features of a laser printer. InDesign will also allow you to print larger images by 'tiling' them to the printer, so they can be pieced back together and exposed to a photo litho plate.

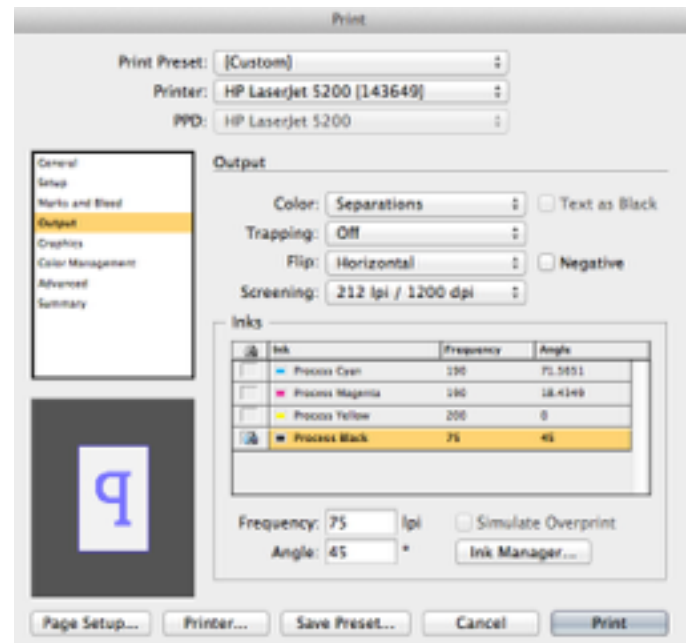
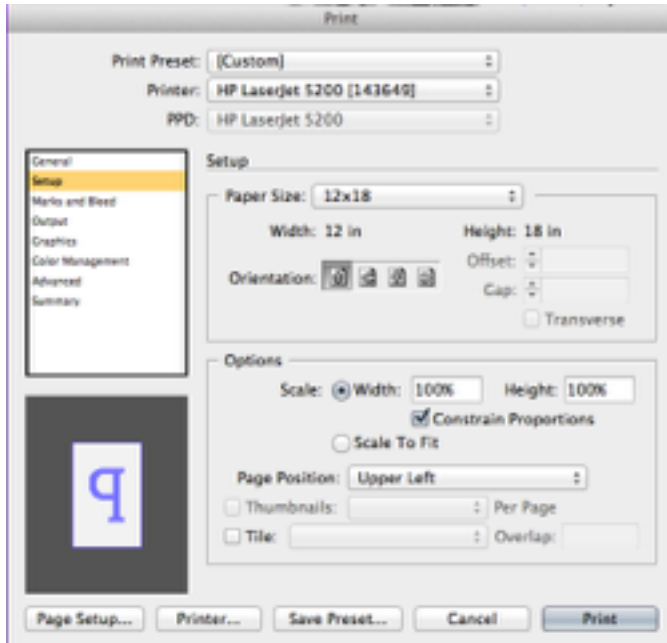
Using InDesign

Printing a film on a laser printer requires the use of both Adobe Photoshop CS5 and InDesign. Your Photoshop file must be converted to Greyscale Mode (If you are printing color separations you will need a CMYK file, or a greyscale file with either Duotone settings applied, or one or more spot channels).

1. In InDesign, create a new document that is the same size as the paper you will send through the laser printer.
2. Go to MB > File > Place... to select and place your image file in InDesign.
3. Once your image is positioned go to MB > File > Print.
Under Setup, select the Printer and Paper Size to match your paper and printer.
4. Under 'Output', switch 'Color:' to Separations. 'Flip' your image Horizontally so it will print reversed. Turn off the printer icon next to Cyan, Magenta, and Yellow, so only the Black (Greyscale) plate will print. Set the Frequency for the black plate to 75 lpi and the angle to 45°.
5. Click Print.

If you are printing a Duotone, spot channels or a CMYK color separation, the angles for each film are: Black/Darkest Color: 45°, Cyan/Next Lighter: 15°, Magenta/Next Lighter: 75°, Yellow/Lightest: 90°.

75 lpi works well since it is easy to control when printing by hand, and still holds a great deal of detail and tonal information. Printing higher lpi images usually requires more skill and control. Usually, you wouldn't want to go above 95lpi unless you are working with very smooth and thin papers. 85 lpi works well with care and the texture of most printmaking papers.



It is also important that you keep your image files and InDesign files saved in the same folder, since InDesign only creates a link to the image that it accesses when printing.

Making Transparencies from Laser Prints & Photocopies on Paper

If you saturate your laser prints or photocopies with baby oil or mineral oil (unscented baby oil) they will be transparent enough to expose your plates. Soak a very small rag with the oil and work it into the back of the paper until it is evenly translucent. Wipe up all of the excess oil from the paper with a clean rag. The excess oil can be blotted up by placing the oiled print between newsprint for a few hours.

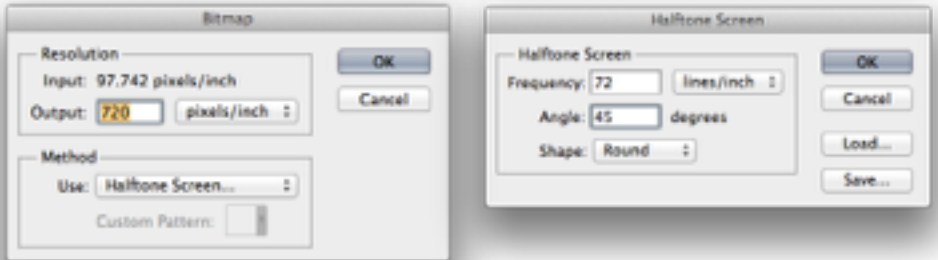
Photo/Digital Images from Inkjet Printers

Inkjet printers create very fine photographic quality images, which can be challenging to print by hand, especially for less experienced printmakers. Inkjet printers do not by default produce images with halftone dots like laser printers, but instead use a random pattern or 'dither' of ink dots. Tonality is created through the frequency or density of the dots rather than the amplitude or size of the dot as with halftones.

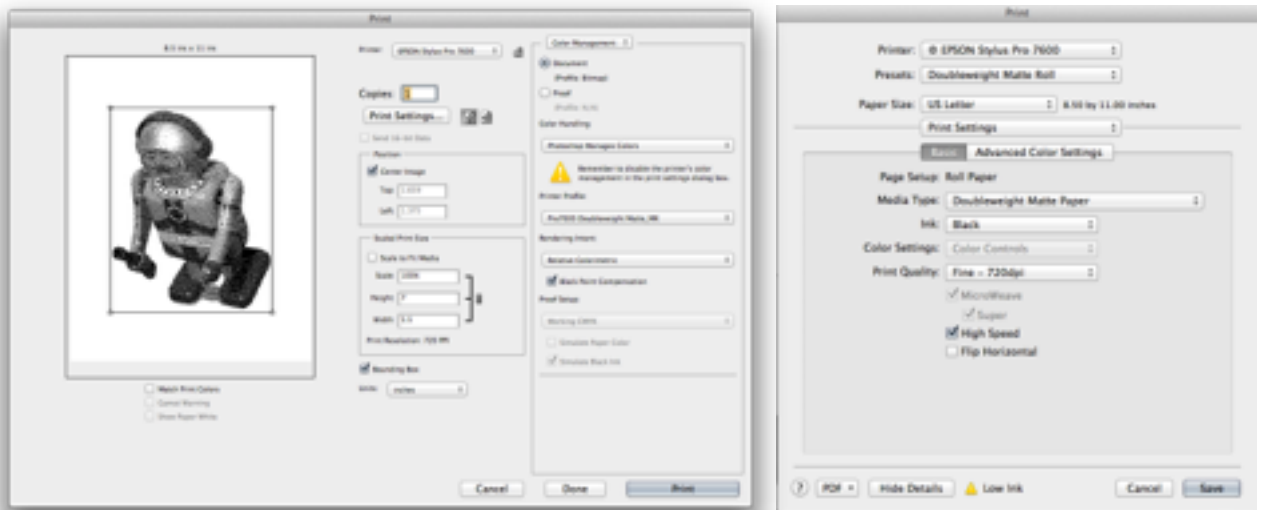
However, Inkjet printers can be 'tricked' into printing halftone dots. You can achieve this by converting a greyscale file into a bitmap with a halftone, as long as you follow some rules. If you divide the printer's resolution (1440 for an Epson) by 20 (or another even number that results in a whole number), you can determine the lpi to set when you convert the image into a bitmap. This will prevent moires from occurring in the halftone pattern when the lpi

conflicts with the resolution of the printer. You will also need to set the bitmap output resolution to match the printer's resolution divided by 2.

The settings look like this:



Printers that use pigmented inks for glossy photo papers produce the most opaque dots for film. The printer should be set to print at least 720dpi/Fine. Pictorico OHP Film (www.pictorico.com) is the best to use and a little more expensive than others, but there are many types of film available.



Basic settings for printing transparency film on an Epson inkjet printer.