

Photolithography / Positive Working Litho Plates

DIGITAL & PHOTO PRINTMAKING

CREATING YOUR IMAGE

Hand Drawn Images

- Frosted Mylar or Grained Mylar
- India Ink, Gouache, Acrylic Paint
- Litho Crayons, Stabillo Pencils, Black Ball-point Pens, Micron Pens
- Toner Washes

Digital / Photo Images

- Oiled Photocopies
- Photocopier Transparencies
- Oiled Laserprints (75-85lpi)
- Imagesetter Film (85-95lpi)
- Inkjet Transparencies (Pigment inks, black only)

LASERPRINTERS

By default most laser printers will print images at a much higher lpi than can be used for hand printing. Lines per inch (lpi) is a measurement of how many lines of small varying sized halftone dots are used to create the illusion of a continuous tone image. Since printing these plates by hand requires more ink and pressure than offset printing, which is what they were intended for, we need to decrease the lpi to 75. If you did not do this, the ink sitting on top of all the very tiny halftone dots would quickly run together. To prevent this from happening we lower the lpi to maintain a balance between the amount of ink that is needed to print and the space around the dots to hold water that repels the ink. To adjust this in Photoshop go to MB> File> Print with Preview... and select 'Screen'.

Set your Halftone Screen's Lines Per Inch to 75.

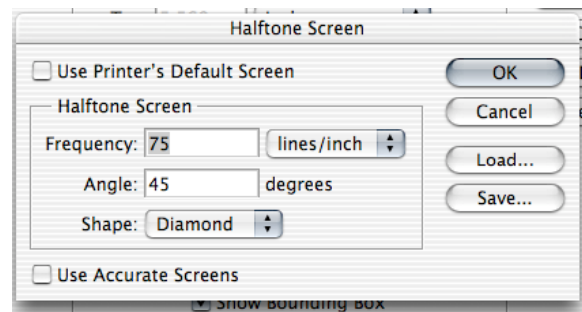
Angles for 4 Color images:

Black/Darkest Color: 45°

Cyan/Next Lighter: 15°

Magenta/Next Lighter: 75°

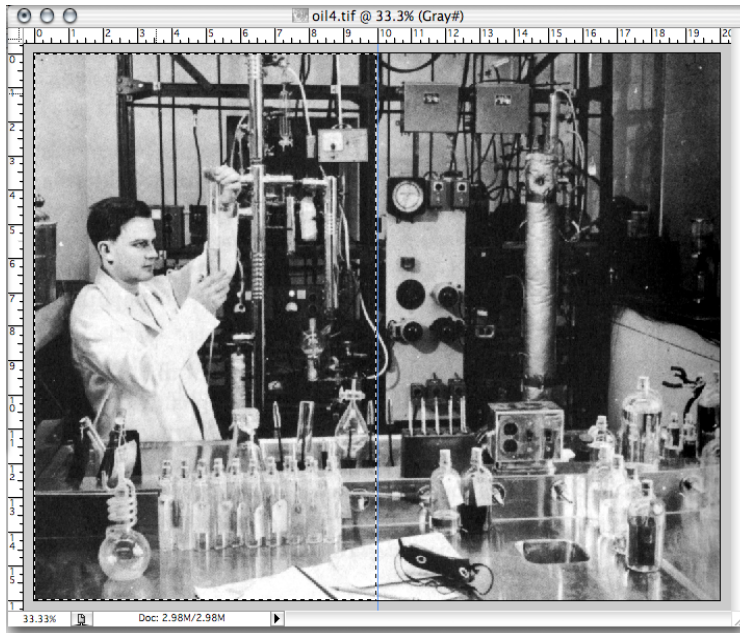
Yellow/Lightest: 90°



TILING LARGE IMAGES

If you have an image that is larger than the printable area of the laserprinter, about 10x16", you will need to 'tile' your image by printing it in sections. This can be easily done in Photoshop using ruler guides and the rectangular selection tool.

The following image is 16x20" and will need to be printed to two 11x17" sheets of paper at 16x10" each. First, turn on your rulers by selecting MB> View> Rulers. Next drag a guide from the ruler to its appropriate location. In this example a vertical guide at 10" is necessary. You can now use the rectangular selection tool to select the first portion of your image. To print this section go to the 'Print with Preview' dialogue box and make sure that 'Print Selected Area' is checked, adjust your screen lpi and print as usual. Continue in this way until your entire image is printed.



Using the ruler guides and the rectangular marquee to tile your image to the laser printer.

MAKING OILED TRANSPARENCIES FROM LASERPRINTS & PHOTOCOPIES

If you saturate your laserprints 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 several hours or overnight.

ENHANCING THE TONER OPACITY

The black areas of most laserprints and photocopies will not be quite dense enough to block out all UV light from the exposure unit and can create mottled areas rather than solids in your final prints. This can be fixed by spraying a coat of Krylon Matte Finish Spray onto your laserprint or photocopy. It will cause the toner to swell, making a substantially denser image.

WORKING WITH INKJET TRANSPARENCIES

Inkjet printers do not produce images with halftone dots 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. Inkjet printers also produce very fine, photographic quality images, which can be too fine for photolithography. To overcome this problem, print using the black ink only, to create a film with dots that are more distinct. (Inkjet printers will print greyscale images using all of their color inks otherwise.) Printers that use pigmented inks for glossy photo papers produce the most opaque dots. The printer should be set to print at least 720dpi/Fine but 1440dpi/Photo is best. The quality of film is important too. Posjet Film (www.posjet.com) is good and is available in a variety of sizes. Pictorico OHP Film (www.pictorico.com) is the best but more expensive.

Although inkjet printers cannot produce halftones, the grain of the image can be increased to make the image easier to print from the plate. The PhotoShop filters Noise, Grain, and Unsharp Mask can be used sparingly to help accentuate the graininess of the image. Epson 3000 printers produce excellent films that will print well from photo plates without additional adjustment.

EXPOSING & DEVELOPING YOUR PLATE

APPROXIMATE EXPOSURE TIMES FOR THE AMERGRAPH 150

Oiled Laserprints and Photocopies: 80 light units

Frosted Mylar: 80lu

Clear Film: 40lu

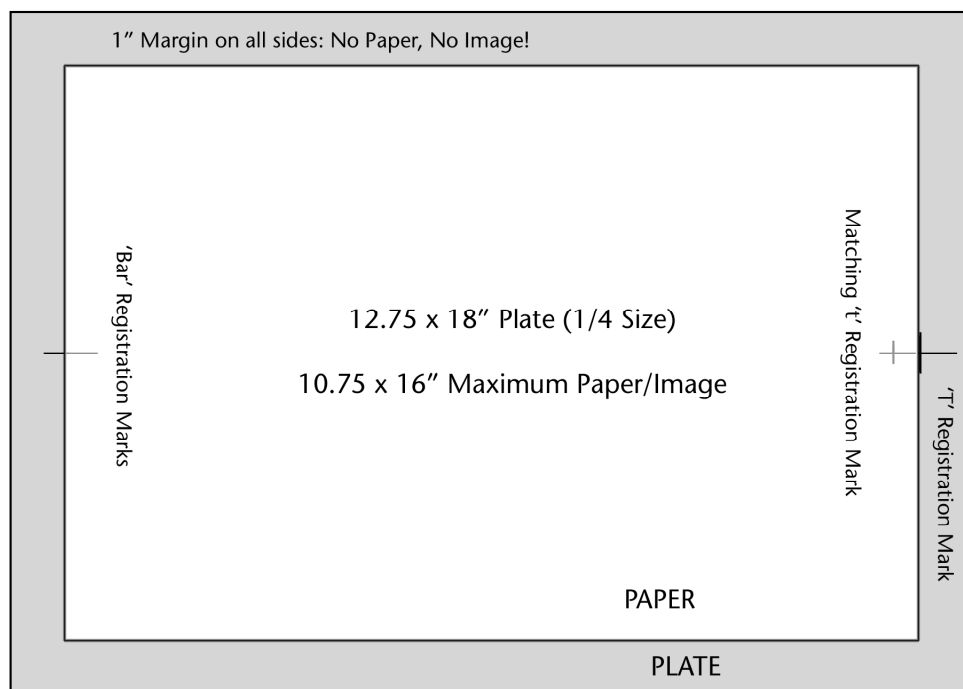
Inkjet Transparencies: 40lu

All times are approximate! You may need to test your images individually. Remember to expose *emulsion to emulsion*.

DEVELOPING YOUR PLATE

1. Put your gloves on.
2. Shake the developer before using. Pour a generous amount of developer onto your plate. Make sure you develop the edges of the plate completely. Development should take about 1 – 2 minutes.
3. Rinse both sides of plate well with water.
4. Squeegee off the excess water on the plate. Rinse out the developing tray and pad.
5. 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.
6. Apply a thin layer of the Finisher/Cleaner to the plate with a sponge at the press **with the vent turned on!**

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



PRINTING

PREPARE YOUR PAPER AND NEWSPRINT

Tear down your paper to fit your image (Note: The paper should NOT be larger than the plate.) Use a 3-H pencil to make 'T & Bar' marks on the back of your paper. Prepare as many sheets of newsprint as sheets of paper you will be printing plus 4 extras. The newsprint should be larger than your printing paper.

SETUP THE PRESS FOR PRINTING

1. Center your plate on the press bed and install a scraper bar that is narrower than your plate but wider or equal to the width of your paper.
2. Grease your tympan, set pressure and traverse marks. Be certain that the scraper bar will not start before the edge of the plate or run off the end of the plate.
3. Take out a small amount of Litho Black 1796 and Crayon Black Litho Ink. Mix together about 20-30% Crayon Black and 70-80% Litho Black. Lay out a small bead of ink. Roll-out your ink. Start with very little ink, or what is referred to as a 'lean slab'. The surface of the ink should be satin in appearance and make a soft sizzle noise.
4. Get two bowls: one with cold water + 1 Tablespoon Glycerin and 1/2oz Gum Arabic. The other bowl should be empty and is used to discard dirty water.
5. Lay your paper and newsprint in two separate piles on the table next to the press.

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 good paper.

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 is usually what causes inconsistencies between prints.

Before printing on good paper for the first time, add ink. You can control print quality primarily through inking. 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 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 Handschy, 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. Fine pore sponges with rounded corners, and adding glycerin and a little 50/50 can help alleviate these problems. Adding 10% white will tighten the ink and can prevent roller and sponge marks while making it print cleaner. Too much white will deaden your color.

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:

1. Put on gloves and turn on the vent.
2. Apply a small dollop of Finisher/Cleaner and work over the plate with a rag.
3. Rinse the plate off with water and a rag.
4. Apply a thin layer of gum that has been just slightly diluted with water. Sponge down and dry.

If you don't want to save your plate, fold it in half and put it with the other plates to be recycled.

CLEANING THE ROLLER

1. Put on your gloves!
2. Scrape up the ink on the slab with a razor scraper and discard on a phone book page.
3. Roll the excess ink off the roller onto the slab and scrape up.
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 SOLVENT 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!