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POLYMER PHOTOGRAVURE WORKSHEET

AQUATINT SCREEN METHOD

FILM OUTPUT

EDITING

The polymer photogravure process requires a black and white film positive, so the first step is to convert the file to Gray Gamma 2.2, if it's in RGB. Edit > Convert to Profile > Gray Gamma 2.2

Edit the image in Photoshop using any of the available tools.

Once editing is complete and the image looks perfect, adjustments need to be applied to compensate for any contrast differences between the inkjet printer, the film, and the polymer plate. Without this step, what you see on your monitor will not be anywhere near what you see in your print.

SET THE BLACK AND WHITE POINTS

Create a new Levels layer. Image > Adjustments > Levels

While holding down the Option key, click and drag the black point slider to the right until the minimum of black dots appear and let go. Now, hold down the Option key again and move the white point slider to the left until white dots just start to appear. If the mid-tones change too much then the middle slider can be moved to make further adjustments, although this is not normally necessary.

APPLY CONTRAST ADJUSTMENT LAYER

Create another new Curves layer. Image > Adjustments > Curves
Apply adjustment curve KM73.acv

OUTPUT

The image is now ready to be printed. Flatten the image layers and output to a sheet of film using the following settings. The film has a glossy and a dull side. The dull side is the side to be printed on. Whereas the Direct to Plate method uses the matte black ink, the screen version uses photo black.

COLOR MANAGEMENT

Color Handling: Printer Manages Colors
Rendering Intent: Relative Colorimetric

Send 16-bit Data: Checked (if an option)
Black Point Compensation: Unchecked

PRINT SETTINGS

Media Type: Ultra Premium Photo Paper Luster Ink: Photo Black
Color Mode: Off (No Color Management) Output Resolution: 1440dpi
Do NOT check Flip Horizontally

Once it has been printed, the shiny side (backing) will have a milky appearance to and needs dry before use. This will clear naturally if left hanging overnight or by using a hairdryer.

PLATEMAKING

The plates are very slow in speed, and you can safely work in low level tungsten lighting, but they are sensitive to ultraviolet, fluorescent and daylight, so avoid any exposure to these types of light.

The plate is exposed twice to UV light. Once in contact with an aquatint screen that breaks up the image into random dots that will hold the ink, and then again with the image film positive. It's then processed in water for several minutes, dried and hardened by exposing it once more to UV light. The plate can then be inked, wiped and printed as with any intaglio plate.

One of the most important requirements of this process is complete contact between film and plate. Any uneven contact will result in problematic plates. This is usually the biggest hurdle for anyone working with this process. The only way that complete contact can be made, especially for larger plates, is with a vacuum frame and by replacing the glass with a plastic material called Kreene. This material is a soft, semi-opaque plastic that is used in making polymer plates for letterpress printing.

CUTTING THE PLATE TO SIZE

The plates consist of a UV light sensitive polymer layer bonded to a metal base with a protective Mylar cover sheet covering the polymer.

Although the metal base is thin, cutting the plates cleanly is one of the most important steps in the process. Any rough edges or bending of the plate during this step will affect the contact between the film and plate and will show in the final print. This will also lead to inconsistent results between tests. The perfect plate has a clean-cut edge and is perfectly flat.

The easiest method is with a Kuttrimmer. This guillotine ensures the edges are cut clean and without burrs. It is possible to use a utility knife and a metal straight edge and repeatedly score the plate until it snaps easily, but care should be taken to ensure a clean break and to avoid any bending of the plate.

If the image is to have a border and a plate mark, then the plate can be cut once, approximately 1/8" - 1/4" larger than the image size. If no border is required and the image is to bleed to the edges of the plate, then it's best to work with a plate size slightly larger than the film to ensure good contact and then cut the plate with a Kuttrimmer to the final size after processing.

EXPOSING THE PLATE

Remove the protective plastic sheet slowly and carefully. At this stage the polymer is soft and easily damaged. The smallest of marks WILL show.

Carefully brush the aquatint screen free of dust and place emulsion side down (dull side in contact with the polymer) onto the plate. Place this sandwich into the frame

being careful not to move the screen and close the frame. Start the vacuum, wait 10-15 seconds to ensure good contact and expose for the screen exposure.

Stop the vacuum, remove the aquatint screen, and replace it with the film positive. Close the frame, start the vacuum again, wait 10-15 seconds to ensure good contact and expose for the image exposure.

Stop the vacuum, remove the plate from the frame and carefully put aside the film. Use a Sharpie to mark the steel back of the plate with the exposure and processing time.

PLATE WASHOUT

Fill a tray with approximately 2 litres of water at about 70-72° - the exact amount isn't critical, but the temperature is. Water that's very hot will wash away too much polymer while water that's too cold will have little effect.

Place the plate polymer side up into the water and gently brush with a paint pad or sponge for 4 minutes. The aim is to gently wash away the soluble polymer - no great force is needed to achieve this, just gentle, constant contact.

After 4 minutes remove the plate and immediately dry it by placing several sheets of dry newsprint on the surface of the plate and gently wiping a hand over the paper. Be careful not to move the paper which can damage the soft polymer. This step should take about 5 seconds.

Quickly and carefully remove the paper and start drying with a hairdryer set on low heat. A film drying cabinet is perfect too, if available. Dry the plate for a further 5-10 minutes.

POST-EXPOSURE HARDENING

Once the plate is completely dry it is hardened and cured to withstand the pressure of the press. This is done by re-exposing the plate to UV light without the contact frame, film or screen. This exposure time is not critical but should be the same, or longer, than the original screen and image positive exposures combined. Longer times won't damage the plate. After this hardening exposure it can be cut down further, if no border or plate mark is required and the image is to cover the entire plate.

PREPARING THE PLATE FOR PRINTING

At this point the corners can be rounded using a file and the edges made smooth with a sanding block. The aim is to obtain smooth edges that are not only safer to work with but won't hold ink. The edges of polymer plates can be a lot harder to keep clean and wipe free of ink than copper plates and ink can sometimes creep between the polymer and the steel and only become noticeable in the final print. Sharp corners can catch the tarlatan when wiping the plate, bending the plate and can also pierce the damp paper.

DETERMINING THE SCREEN AND IMAGE EXPOSURES

SCREEN EXPOSURE

The first step in the process is to determine the amount of exposure necessary to give a good black without resulting in areas of open bite or becoming too light and grey. Make a step test by simply exposing and processing a small plate in contact with just the aquatint screen using a range of times. During washout some areas will wash away completely (resulting in open bite) while others will be overexposed and produce lifeless grey areas. Somewhere between these two extremes will be a series of steps

that, when printed, will give a good black. Choose a step that has just enough exposure to safely produce a deep black without the polymer washing away. This screen exposure will remain constant between plates regardless of the image and need only be retested when using a new batch of plates.

It's also possible to control the overall look of an image by varying the two exposures. The screen exposure mostly controls the blacks and the shadows, while the image positive controls the whites and the lighter tones

IMAGE EXPOSURE

Expose a plate to the screen using the exposure time determined above. Remove the screen and place the image positive on the plate. Make a step test by exposing the plate to a series of steps of varying exposures.

Remove the film from the plate, process and harden as normal.

Print this plate and determine the best exposure for the image. If the shadow areas are too dense and too black, or if the polymer is washing away leaving areas of open bite, the screen exposure can be increased slightly and the image exposure reduced to soften the shadows.

MATERIALS & SUPPLIERS

FILM

Fixxons waterproof film. This is the substrate used for making the film positives - www.fixxons.com

POLYMER PLATES

Jet plates available from Mountain Intaglio – www.mountain-intaglio.com
Toyobo Printight KM73 available from Boxcar Press - www.boxcarpress.com

AQUATINT SCREEN

I have my own screens made for me - www.keithtaylor.shop

MISCELLANEOUS

Paint pad – Used to gently washout the polymer plate and available at any hardware stores.

Nitrile gloves – Hardware or drug stores.

Kuttrimmer – or a utility knife, a straight edge, and LOTS of care.

Sheet magnets – The plates are steel backed and a lot easier to handle both in the washout and during the inking and wiping of them if they can't move around - www.custom-magnets.com

Paper – Wet Paint or The Art Cellar (at MCAD). Any good quality etching, or printmaking, paper. Hahnemühle Copperplate or Rives BFK are good choices and available in different weights and colours.

BUYING PLATES

There are many brands of polymer plate with different polymer and steel thicknesses and hardness. The plate that gave me consistent results over the past 20+ years was the Toyobo Printight KM73 plate. It has a resolution and hardness that's perfectly suited for intaglio and photographs. Unfortunately supply chain issues have made supplies of this plate very erratic. My preferred plate now is the Jet LSL 94SM from Mountain Intaglio used with the Direct-to-Plate method. Plates should be used within 9-12 months, so try not to order any more than you can use in that time.

PRESS SETUP & PRINTING

PRESS SETUP

The press setup is slightly different than for copperplate, in that more pressure is required with the polymer plates. Rather than using three blankets (pusher, cushion, and sizing catcher), leave out the cushion blanket; this will result in more pressure. You should now have the thinnest blanket (the sizing catcher) next to the press bed and the thicker blanket (the pusher) on top, next to the roller.

Adjust the printing pressure by turning the adjustment screws equally, making sure both micrometer dials read the same for even pressure across the bed. Once you start proofing your plate you may find it necessary to increase or decrease the pressure. Make a note of this final setting for future printing sessions.

INKING & WIPING

Before inking the plate, start soaking a sheet of paper. Hahnemühle Copperplate Etching will need about 5-10 minutes in the water. Mark the back of the paper with an 'X' to distinguish the print side from the back and if there are others using the presses at the same time, initial your paper too.

Start preparing the ink. You may need to add a *small* amount of Clearset. Mix thoroughly and work the ink with a metal ink knife. Add any modifier to the ink in small increments - not much is needed to make a big difference. Using either a plastic spreader or a piece of clean card, take a small amount of ink and with the spreader at a slight angle draw the ink down the plate. Repeat until completely covered. Now use the spreader to carefully remove as much surface ink as possible, keeping the spreader nearly vertical, placing the excess ink back on the ink slab. The more ink you can remove at this stage the less wiping you'll need to do.

Tightly ball up the tarlatan so that it has a smooth face and start wiping. The idea is to gently wipe the surface clean of ink yet leave the pits of the plate still filled. Use a light, circular motion over the entire plate. Start with a dirty tarlatan to remove most of the ink but then change to a cleaner one when you start to see the image. Be careful when using old tarlatans as any dried ink can scratch the polymer.

Clean the plate border and edges with a shop rag and whiting. Wipe the back of the plate of any ink that may squeeze out from the edges and ruin the print.

PRINTING

Place the plate face up on the press bed. With clean hands, remove the paper from the water bath and place it on a blotter face up. Place a clean towel, or a second blotter, on the paper and rub evenly all over. The paper needs to be slightly damp and with no surface water. A paper that's too damp will stick to the plate while one that's too dry will produce a print that is blotchy.

Position the paper face down over the plate and cover gently with the blankets without moving the paper or plate. Roll the bed through the press, slowly pull back both blankets and peel the print away from the plate. If this is a test print it's a good idea to mark any exposure, press settings and ink information on the print in pencil at this

point. Place the print on the drying rack. Clean the press bed after each print to ensure the next person doesn't get their print spoiled by your ink!

CLEAN UP

There's no need to clean the polymer plate in between prints, only at the end of the printing session. Use SOYsolv and/or Simple Green on the press bed and SOYsolv or a vegetable oil on the plate. Store the clean plate in a Ziplock bag and preferably flat and in the dark. Over time, despite how well it's stored, the polymer will dry out, harden, and crack.

At the end of the session clean excess ink from the ink slab with an ink knife and place it on a page from the phone directory, or a piece of newsprint, and throw in the garbage. Alternatively, you can keep a large amount of ink by placing it in a small piece of aluminum foil, folding the edges over to make a tightly sealed packet. Make a note of the ink and modifier on the foil with a Sharpie. Clean the slab with SOYsolv followed by Simple Green.

Place all used tarlatans and shop rags in their appropriately marked containers. Unscrew the pressure screws on the press, roll up the blankets and return to their proper storage place.

INKS AND MODIFIERS

Etching inks usually needs to be modified before they can be used with polymer plates. Most often this means creating an ink with less viscosity, or body, as the polymer plates tend to release the ink less easily than copper plates. I like Charbonnel black inks mixed with either a brown or blue ink to create a warm or cool black with a small amount of Clearset. Add any modifier to the ink in small increments - not much is needed to make a big difference. Only through proofing the plate will you be able to tell if it needs a looser or stiffer ink.

When taking ink from the can do not dig into the ink but remove it in a circular motion from the surface using an ink knife, keeping the surface smooth. The ink is less likely to dry out if stored this way.

BLACK INKS

Charbonnel Universal 55981

Ivory Black.

Very viscous, opaque, and completely last-fast. A good average black.

Charbonnel RSR

Carbon Black.

Viscous, but supple, black. Completely lightfast. Usually needs less modifying than other blacks when used with polymer plates.

Charbonnel Soft Black

Ivory Black.

Very soft and supple black but slightly less opaque. Good for plates that have a lot of contrast.

Charbonnel Carbon Black
Carbon Black.
Low viscosity and very easy to wipe.

INK QUALITIES

Body
The stiffness or viscosity of the ink.

Length
Tap the knife in the ink and then draw the knife straight up. The thread of ink will indicate the whether the ink is long or short.

Tack
The stickiness of an ink.

MODIFIERS

Magnesium Carbonate
Adds body, stiffening the ink, and reduces length.

Calcium Carbonate (Whiting)
Removes ink from plate borders.

Easy Wipe, Clearset
Tack reducer used to soften inks and making wiping easier.

Transparent Lake
Adds transparency and lightens colours.

TARLATAN

Soft Tarlatan
Softer than regular tarlatan and requires no breaking in.

Akua Wiping Fabric
A very tight, lint-free polyester fabric. Prints have good contrast without streaking.