

## Photo Emulsion Carborundum Collagraph Plate

Based on Rob Swainston and Alison Dell's *Fetching* process. To view a comprehensive video demonstrating the process, visit Fetching Part II:

<https://www.youtube.com/watch?v=JNAoT1j8ZTI&app=desktop>

### Film Negatives for Photographic Carborundum Collagraph

#### Photoshop Correction Curve

A correction curve can be applied to the image in photoshop before applying the halftone, inverting the image, and printing the digital halftone negative. This will help match the desired value range in the digital image to the actual value range the process is capable of producing.

The curve I use for 20lpi 100 grit is available for download on my website.

#### Prepare Digital File for Printing

Follow traditional photo emulsion screen print image preparation to apply a halftone to a continuous tone image. Before printing, invert the image (so the blacks appear white and the whites appear black) and keep in the correct orientation.

*(Note, if creating a photographic carborundum collagraph plate for traditional printing on paper, invert the image, so the blacks appear white and the whites appear black, and flip the orientation so text reads backwards.)*

#### Halftone

Carborundum grit size affects the range of halftone lpi capable of producing a legible image with a full tonal range.

#### 100 Grit

100 grit produces a full tonal range up to a 20 lpi halftone screen. Though the image is coarse, this grit size produces a rich black when cast and inked in a flexible silicone matrix.

#### 120 Grit

120 grit produces a full tonal range up to a 28 lpi halftone screen. A finer image can be produced with 120 grit, though it is more challenging to get rich blacks in the final hydrocal cast.

80 grit and below is too coarse, resulting in a low resolution image and pits in the flexible silicone matrix that will hold too much ink and poorly transfer.

150 grit and above is too fine, resulting in a higher resolution image, but one whose pits in the flexible silicone matrix are too shallow. When the flexible silicone matrix is inked and wiped, the midtone and dark areas will not hold enough ink and will cast in hydrocol with papery, uneven tone, similar to an over-wiped, traditional collagraph plate printed on slightly dry paper.

*(Note, if creating a photographic carborundum collagraph plate for traditional printing on paper, finer grit sizes are desired as they produce higher resolution images and are easier to wipe. In the Fetching Part I video 240 grit carborundum is recommended as it is easier to wipe than more coarse carborundum grit. A test plate is recommended to check the ideal halftone LPI, and to see if the digital image requires a Photoshop value correction curve to achieve the highest possible range of value.)*

## Materials

- Screen print station
  - Screen print frame with image stencil flat the size needed for the PETG image area (220-250 mesh)
  - Screen print registration board
  - Photo emulsion (McLogans: MacDermid Autotype Autosol Plus 2000)
  - Squeegee 1-2 inches wider than the image area
  - 2x4 blocks to rest squeegee on
  - 2x4 block to prop up screen
  - Rag to clean hands
  - Newsprint to spread beneath work space
  - Newsprint to clean screen between printing PETG
  - Personal protective equipment: apron, nitrile gloves, eye protection
  - Yellow or amber safelight room
  - Light-proof drying cabinet
  - Washout booth
  
- Carborundum dusting station
  - 100 or 120 carborundum grit
  - Dusting container (powder sugar dusters work well)
  - Several sheets of newsprint or stiff paper, larger than the PETG plate
  - Sharpie to mark the backside edge of plate with the date and grit size

## Casting Flexible Silicone Matrices

Any traditional topographic printmaking matrix, or *master matrix*, can be cast in two-part silicone rubber to create a *flexible matrix* that will hold ink in either the intaglio areas, below the surface, or the relief areas, above the surface. It is useful to envision the desired end result and work backwards to figure out the best way to create the master matrix needed to achieve the desired final cast print.

There are basic principles that hold true no matter which type of master matrix is used. The master matrix should be right reading, in the same orientation as the final image. Remember, it is the cast flexible matrix that will flip, which when cast, will again flip to the correct orientation.

### Two-Part Silicone Mold

#### Ecoflex 00-50

Ecoflex 00-50 is the two-part silicone rubber recommended for casting a flexible matrix.

#### Ecoflex 00-50 Cast Thickness

If casting a flat sheet to use with pronto plate and monotype, cast the sheet 2mm-2.5mm thick. A clean, degreased piece of PETG can be prepared with sulfur free modeling clay cut into strips and applied as a barrier to create an edge the desired dimension of the cast sheet. A release agent such as Ease Release 200 should be used on the PETG for easy demolding of the Ecoflex. Use a level before casting to ensure the PETG is fully level.

If casting a topographic master matrix, an Ecoflex face coat is first cast, then a reinforcing fabric is added with an Ecoflex backing coat. The reinforcing fabric will stabilize the flexible matrix while inking, and will determine the characteristic of the final cast. Woven cotton fabric will keep the matrix dimensionally stable, with the warp and weft fixed dimensions and stretching only taking place on the bias. Knit fabrics will create an all-over stretchy, flexible matrix, especially if four-way stretch knit fabric is used. White fabric should be used to fully reveal the ink color and opacity.

Prepare your topographic master matrix for casting by sealing, if needed, with gloss acrylic spray and allowing to cure overnight. Create a raised edge the desired dimension of the cast sheet with sulfur free modeling clay cut into strips and applied around the perimeter as a barrier. I typically make the cast sheet about a half inch larger on each side than the image area to allow for a margin for the hydrocal casting formwork to clamp to. Prepare a piece of clean stabilizing fabric by ironing smooth. Use a level to check the casting area is completely level, so the resulting ecoflex sheet will be a uniform thickness. Cast the face coat 1.5mm thick, leveling if needed with the long edge of a tongue depressor. Allow to cure until tacky (about 30-60 minutes). Pour the backing coat 1mm thick and level if needed with a tongue depressor. Drape the reinforcing fabric over the liquid ecoflex. If needed smooth out with a tongue depressor. Allow to fully cure before demolding.

### Formulas

- .024 oz mixed Ecoflex 00-50 per 1 square inch at 1 mm thick
- .036 oz mixed Ecoflex 00-50 per 1 square inch at 1.5 mm thick
- .048 oz mixed Ecoflex 00-50 per 1 square inch at 2 mm thick
- .06 oz mixed Ecoflex 00-50 per 1 square inch at 2.5 mm thick

Example formula for a 2mm thick 6 x 8 inch flat ecoflex sheet

- 6 x 8 inch cast = 48 square inches
- 48 sq. in. multiplied by .048 equals 2.304 oz at 2 mm thick
- 48 sq. in. multiplied by .06 equals 2.88 oz at 2.5 mm thick
- Mix 2.4-2.5 oz Ecoflex

### Materials

Available from Reynolds Advanced Materials

- Ecoflex 00-50
- Nitrile or latex-free gloves
- Stir sticks
- Mixing containers
- Ease Release 200
- Sculptex: Soft sulfur free modeling clay

PETG sheet for casting flat sheet, or sealed topographic matrix

Level

Newsprint to cover work surface

Organic vapor respirator

Well ventilated room

Apron

Long-sleeve shirt

Optional: Stabilizing fabric and iron

## Casting with Hydrocal FGR-95

Hydrocal FGR-95 is a fast setting, white gypsum cement designed for durable, fiberglass reinforced casts.

### Estimate Hydrocal

The most accurate way to estimate the needed volume of hydrocal is to fill your mold with either water or sand and then measure the quantity used.

I use the following formula to estimate quantities:

Length x width x height = total cubic inches

Total cubic inches x 0.5541 = total fluid ounces needed of mixed hydrocal

For a rough guide, divide the total fluid ounces by three and add a little bit. This is the quantity of water ounces to start with. You'll need to add about three times this quantity of hydrocal ounces.

Example:

$8 \times 10 \times .5 = 40$  cubic inches

$40 \times 0.5541 = 22.164$  total fluid ounces needed of mixed hydrocal

$22.164 / 3 = 7.388$

Start with 8 ounces of water, or one cup

Add about 24 ounces of hydrocal, or three cups

Industry standard recommends mixing hydrocal and water by weight using a scale. I mix using a dry earth visual method, with approximately 1:3 water to hydrocal by volume. This makes a consistency similar to pancake batter or greek yogurt. Depending on the humidity of your area, you may need to add more or less hydrocal to water to reach this consistency.

## Materials

Hydrocal FGR-95

Reinforcing fibers: Buddy Rhodes Acrylic Fiber AC50 ¼"

Reinforcing mesh: Boen 9.5"x150' EIFex Mesh Non-Adhesive Eifs Stucco Mesh

Trowel

Mixing buckets and water bucket to clean tools and hands

Measuring cups

Plastic or heavy duty paper (to protect work surface)

Sculptex Soft sulfur free modeling clay (to close gaps in formwork)

Personal protective equipment: Nitrile gloves, dust mask, apron, eye protection

Removing flashing: Surform shaver, files and sandpaper

Optional:

Hardware cloth, ½" galvanized welded cage wire metal mesh

Hanging hardware or ecoflex cleat mold to embed in cast

Formwork:

1x2 pine

½" plywood boards (cut a little larger than cast size)

Johnson's paste wax

Bar clamps

Screws, drill, bits

## Bibliography

### Halftone and Films for Photo Processes

- [www.kevinhaas.com/printmaking](http://www.kevinhaas.com/printmaking)  
Digital Basics for Printmaking and Films for Screenprinting

### Photoshop Digital Image Correction Curves

- [www.alternativephotography.com/digital-negatives/](http://www.alternativephotography.com/digital-negatives/)
- [www.alternativephotography.com/curve-corner-photoshop-curves/](http://www.alternativephotography.com/curve-corner-photoshop-curves/)

### Pronto Plate Lithography

- [www.maggiearberry.com/explorecreate/wp-content/uploads/2016/01/Pronto-Plate-Workshop-Handout.pdf](http://www.maggiearberry.com/explorecreate/wp-content/uploads/2016/01/Pronto-Plate-Workshop-Handout.pdf)
- [www.kevinhaas.com/printmaking](http://www.kevinhaas.com/printmaking) Polyester Plate Lithography
- [www.nontoxicprint.com/polyesterplatelitho.htm](http://www.nontoxicprint.com/polyesterplatelitho.htm)

### Photo Emulsion Carborundum Collagraphs

- Rob Swainston and Alison Dell, Fetching Part II  
[www.youtube.com/watch?v=JNAoT1j8ZTI&app=desktop](http://www.youtube.com/watch?v=JNAoT1j8ZTI&app=desktop)

### Mold Making

- [www.smooth-on.com/tutorials/](http://www.smooth-on.com/tutorials/)

### Ecoflex 00-50

- <https://www.smooth-on.com/products/ecoflex-00-50/>

### Plaster Cast Prints

- [www.nontoxicprint.com/plasterprinting.htm](http://www.nontoxicprint.com/plasterprinting.htm)
- [www.youtube.com/watch?v=mDwl0isLpxg](http://www.youtube.com/watch?v=mDwl0isLpxg)

### Hydrocal Gypsum Cement

- [www.usg.com/content/dam/USG\\_Marketing\\_Communications/united\\_states/product\\_promotional\\_materials/finished\\_assets/hydrocal-white-gypsum-cement-data-en-IG1381.pdf](http://www.usg.com/content/dam/USG_Marketing_Communications/united_states/product_promotional_materials/finished_assets/hydrocal-white-gypsum-cement-data-en-IG1381.pdf)
- <http://www.lagunaclay.com/support/plaster-mixing.php>

### **Fabric Formwork**

- [www.routledge.com/The-Fabric-Formwork-Book-Methods-for-Building-New-Architectural-and-Structural/West/p/book/9780415748865](http://www.routledge.com/The-Fabric-Formwork-Book-Methods-for-Building-New-Architectural-and-Structural/West/p/book/9780415748865)
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- [www.youtube.com/watch?v=36gOx3dguWs](http://www.youtube.com/watch?v=36gOx3dguWs)
- [vimeo.com/62773445](http://vimeo.com/62773445)

### **Casting Material Suppliers**

[www.reynoldsam.com](http://www.reynoldsam.com)

[www.buddyrhodes.com](http://www.buddyrhodes.com)