

# Lithography

## Aluminum Plate Lithography

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### The Five Main Steps in Lithography:

1. Preparing Your Plate
2. Drawing Your Image
3. First Etch
4. Roll-up and Second Etch
5. Printing

### Preparing Your Plate

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#### Cutting Your Plate to Size

The 25.5" x 36" aluminum litho plates can be cut either in half (18" x 25.5"), thirds (25.5" x 12"), or quarters (12.75" x 18"), but shouldn't be any smaller than this. Plates should be handled by the edges only and with clean hands.

Lay the plate face down on a protective sheet of paper on a cutting board. Mark and score the back of the plate about 10 times while firmly holding the straight edge. Flip the plate over and fold the plate up and down. The plate will split at the score.

Round the corners of your plate with scissors and lightly file any rough edges.

#### De-Oxidizing

Before drawing on your plate, it is necessary to remove oxides that build up on the aluminum so the drawing material will attach well to your plate.

To deoxidize your plate, rinse it with hot water. Wipe the entire surface in vertical and horizontal strokes for about two minutes to remove the oxides from your plate. Use a completely clean cotton rag or Webril Wipe that will not scratch or abrade your plate.

If there are noticeable fingerprints or marks on the plate, use the Aluminum Plate Counter-Etch which contains phosphoric and hydrochloric acids. Wear gloves while applying in the same manner as above.

When finished rinse your plate thoroughly. Drain the excess water from the plate and quickly blot dry with newsprint and fan dry.

#### Setting Up Registration and Gum Margins

Determine your paper size, image size and margins. It is best to have *at least* a 1" margin on each side of your plate. Mark these measurements onto your plate lightly with a 3H pencil. Scribe your 'T & Bar' registration marks into the plate with an X-acto knife and apply gum to the margins with a clean sponge.

#### Drawing

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Trace your drawing onto your plate with iron oxide paper if needed. Keep track of which crayons (#1, #3, #5, etc) you use to draw your image, since this will

determine how you etch your image. For fine lines, you will need to sharpen your crayon frequently. Deletions cannot be made at this time.

It is also important to keep in mind that you are drawing on a surface that is medium grey in color. You will want to draw your image darker than you think it should appear, so it will not look washed out when it is printed on white paper. If you think you have finished your drawing, spend more time building the different values in the image.

## **First Etch**

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Once your drawing is complete, determine the etches you will need to successfully stabilize your drawing on the plate. Your etches will be determined by the drawing material you used and how heavy or light the drawing is.

Gather the following materials and proceed with the steps listed next: *Clamps, Clean Sponge, Bowl of Water, Brushes, Plastic Measuring Cups, Dry Cheesecloth, TAPEM, Gum Arabic, Talc.*

1. Clamp your plate to the table.
2. Apply talc to the image and lightly buff it with a cotton wipe.
3. Measure your etches in the beakers and stir with a chop stick. Line up your etches with the weakest on the left, strongest on the right.
4. Apply about an ounce of gum arabic or your weakest etch to your plate and work over the image for about 2 minutes.
5. Spot etch as needed for maximum of 3 minutes. Wipe off the excess gum with a sponge. Dip the sponge in water to rinse out the excess gum, then squeeze out the water.
6. Apply fresh gum if needed and sponge down the remaining gum to a thin layer by alternating horizontal/vertical sponging strokes. Flip the sponge over to the unused, clean side, and thin down the layer of gum even further so it is ready to be buffed down.
7. Buff down the gum film with a cheese-cloth, starting softer, and then working more rapidly with a little more pressure. Use one cheesecloth initially, and then switch to a clean dry one to finish the job.

Wait 30 minutes before rolling up your plate in ink.

## Etch Chart (TAPEM:Gum Arabic) (TAPEM+Drops Phosphoric)

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	Light	Medium	Heavy
#1	1:2	TAPEM	TAPEM+3
#2	1:3	3:1	TAPEM+2
#3	1:3	1:1	TAPEM
#4	GA	1:1	3:1
#5	GA	1:2	1:1
Tusche	GA-1:3	3:1-T	TAPEM+6
Solids	1st Etch: GA-1:3		2nd Etch: 1:1-T
Toner	GA-1:3	1:1	TAPEM+8

## Roll-up & Second Etch

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The next process is to remove the drawing material and replace it with ink so the drawing can eventually be printed. You will first need to prepare the roller, and your ink:

### Preparing the Roller and Ink

1. First remove excess ink from the leather roller by rolling it out on a clean glass slab. The excess ink will transfer to the glass which can be scraped up and disposed of on a phone book page. Depending on how much ink comes off the roller, repeat one or two more times.
2. Soften small amount of Crayon Black ink on the glass by working it with an ink knife. Apply a small bead of ink to the slab and roll out the ink with a leather roller. Your slab should be very 'thin and lean'.

### The Roll-up

Next, gather the following materials and proceed with the steps listed below: *Lithotone, Asphaltum, Rag Cans for Lithotone and Asphaltum, Clean Rags, Sponges, 1 Bowl of Water and 1 Empty Bowl.*

### Always follow the LAW:

**L** = Lithotine

**A** = Asphaltum

**W** = Water

'Charging the Roller' = 8 quick forward and back motions of the roller on the slab.

1 Pass of Ink = Charging the roller, sponging the plate, and 6 steady forward and back motions of the roller across the image.  
(CSI: Charge, Sponge, Ink)

### Roll-up Steps

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1. Turn on the ventilation, pull the vent down to the press bed, and put on gloves.
2. Apply a liberal amount of lithotine and begin washing out the drawing. The drawing should be completely washed out before the next step. Use a clean rag once the first one is totally saturated with crayon and lithotine. Be careful not to let the lithotine seep under the plate. If your gum film was buffed down properly, the drawing should wash out through the gum film easily.
3. Apply a small amount of asphaltum and rub it into the image. Buff it down with a clean rag, and let it dry for 5 minutes. Asphaltum will create a printing base for the ink.
4. Wash off the gum film with a wet rag. Wipe around the margins of the plate first, then quickly wipe across the image about two or three times. This should be enough to dissolve the gum.
5. Use a wrung out dirty sponge to quickly wipe up the excess water. Don't worry about removing all of the gum and asphaltum at this point.
6. Immediately begin to roll-up the image briskly with the leather roller. The remaining gum and asphaltum will be picked up by the roller while the image begins to take ink. Sponge and roll again, and repeat this one more time.
7. Once the excess gum and asphaltum are gone, continue rolling-up the image until it is fully inked and matches the original drawing. If it is a particularly dark image, you will need to charge the roller and continue inking until it is rolled-up full. Images with large solid passages will need Noir a Monter added to the ink.
8. Dry your plate and apply talc to the image and lightly buff it with a cotton wipe.
9. You are now ready to apply a second etch to your image before you print. Modify your second etch based on how your image rolls up. The second etch procedure is the same as for the first etch.

## Printing

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### 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 prints you will be pulling plus 4 extras. The newsprint should be larger than your printing paper.

### Set up the Press

1. Center your plate towards the leading edge of the plate block.
2. Install a scraper bar that is narrower than your plate but wider or equal to the width of your paper.
3. Grease your tympan, set the pressure, and mark your starting and stopping points.

### Mix and Roll Out Your Ink

If you are just printing black, you only need Crayon Black Ink and a leather roller. If your image is particularly dark, you may want to add some 1796 Lithographic Black.

### Printing

Once your paper is prepped, the press is set up and your ink is ready, you are ready to begin printing.

1. Apply and buff down a fresh gum film if necessary.
2. Washout the image with lithotine.
3. Rub-up the image with asphaltum.
4. Wash off the gum film with water.
5. Begin inking immediately. Complete 3 passes of ink and pull a proof on newsprint.
6. Repeat step 5 until you have pulled 3 newsprint proofs.
7. Add ink to your slab, and pull a proof on proofing paper.
8. Use this proof to determine how to proceed with printing on your edition paper.

### Notes on Printing

Once you wash the gum film off your plate with water, immediately begin inking your image by alternating passes of ink across the image, charging your roller,

and sponging. Pull a proof after 3 or 4 passes. Pull at least 3-4 proofs before switching to good paper.

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 at least half the ink off the slab, and charge your roller. Apply one brisk pass of ink and print a newsprint proof. Then proceed as normal.

Once you are finished printing you may either save the image to work on later or fold the plate up to be recycled.

## Finishing Up

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To save your image, roll it up full as if you were going to print it, apply talc, then work a small amount of gum over the plate, buffing it down with a cheesecloth as usual. Or you may choose counter-etch your plate to add to the drawing.

## Clean-Up

1. Using a razor scraper, scrape the ink from the slab. Then roll out the excess ink from the roller and scrape this up. You may now put the roller away.  
***Do not attempt to clean the leather rollers in any way!***
2. Use vegetable oil and a rag to clean the ink off the glass, ink knives, razor scrapers.
3. Use simple green and a rag to clean up the remaining oil and ink residue.
4. Clean the tympan and press bed with simple green. There should be no grease left on the tympan.
5. Clean out the water bowls with a powdered cleanser and rinse out your sponges and cheesecloth.

**YOU ARE NOT FINISHED UNTIL EVERYTHING IS CLEAN & PUT AWAY,  
THANK YOU VERY MUCH!**