

Etching and Stabilizing the Stone:

Stone lithography has the great benefit of resilience. The processes, which establish the image for printing, have greater physical depth than on aluminum or plastic. Students should remember that limestone is able to absorb grease and water, but not both at the same time in the same place. Therefore, the stone has the necessary printing information at significant depth in its surface. The printer's goal is to preserve the balance desired between dark and light, between printing and non-printing areas. Steps involved in achieving this include evaluation, etching, and correction or adjustment.

Evaluation:

The printer needs to evaluate his or her image on stone for both the grease content of the drawing materials and the intention of the artist. If the drawing materials contain little or no grease, the etches need to be weak. If the drawn image is exceedingly greasy, the image needs to be given a strong etch.

The quality of the stone itself can also play a role in evaluation. Bluish gray stones are harder and denser than yellow/white stones. Accordingly, a blue stone can be etched with a stronger etch without undercutting the image. Yellow/white stones may require a strong etch to keep greasy areas from filling in while requiring an exceptionally weak etch in delicate areas.

A chart is provided below showing the general principles involved.

Drawings done with relatively greaseless materials:

Number five Korn's crayons and Stone's crayons from number five through seven have little grease in them. They are dominated by hard wax such as carnauba and have other materials in them to make them easier to wash out. Prismacolor, graphite, and even cont'e crayons can be made to print but were never developed with printing in mind.

Liquid drawing materials such as shellac, Liquitex medium, Xerox toner, and India ink can be made to print. Their etches need to be mild or weak and treatment may vary from the normal when initially printing.

Light drawing middle value dark drawing

Korn's #5	Pure gum	3 drops Phosphoric	5 drops Phosphoric
Stone's #5, 6, 7	Pure gum	Pure gum-3 drops	Pure gum -5 drops
Prismacolor: Spray with water and allow to dry.	Pure gum	Pure gum	Pure gum

Graphite or Conte crayon	Water and gum... roll up immediately with wet rub-up*	Water and gum... roll up immediately with wet rub-up*	Water and gum... roll up immediately with wet rub-up*
Liquitex / acrylic media	Weak etch wash out with lacquer thinner	Weak etch wash out with lacquer thinner	Weak etch wash out with lacquer thinner

Shellac/India ink	Weak etch. Roll up on dry gum flood stone and continue to roll. Washout after image has been printed using both lithotone and lacquer thinner or alcohol.	Weak etch. Roll up on dry gum. Flood the stone and continue to roll. Washout after image has been printed using both lithotone and lacquer thinner or alcohol.	Weak etch. Roll up on dry gum flood stone and continue to roll. Washout after image has been printed using both lithotone and lacquer thinner or alcohol.
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* A wet rub up is a variation on inking in which an unfortified image is inked with a cheesecloth loaded with dissolved ink, or with products intended for this purpose including Corneline and Quadruple Ink. In each case the inks are more fluid than those used on a roller, and are applied with a softer surface. Cheesecloth with a small amount of solvent in it can be rubbed in an existing ink slab to achieve the desired consistency. Generally this occurs at the transition between liquid and stickiness. That is, rub the cheesecloth on one side of the slab in a circular motion that crosses onto the clean inking slab. As the solvent dries and more ink is pulled into the cheesecloth, the ink will begin to stick in the previously clean area. At this point the stone may be inked by rubbing through a thin film of moisture.

Grease bearing drawing materials:

Crayons below number five include increasing amounts of grease and other softening materials. Soap is present in Korn's crayons and those of some other manufacturers. Stone's crayons are entirely wax, but similarly, are numbered so that the softer greasier crayons have lower numbers.

The goal of the printer is to match the grease content of the drawing materials with the etch to achieve a balance state in which the drawing holds its value structure. Of course, the printer may interpret the drawing favoring an area so that it becomes darker, or deliberately etching another area so that it becomes lighter, or so more contrast is obtained. Under etching promotes darkening of an image. Over etching reduces details in the lightest areas and creates more open areas free of ink.

Nitric Acid and gum Arabic are the basic components of etches used for grease bearing drawing materials. Gum Arabic is a water-loving (hydrophilic) material from the sap of Acacia trees. It is a long organic molecule that ends with a carboxyl radical. This is an acid like ending to a molecule that attracts and absorbs water. The carboxyl group is the same chemical means of attachment that binds grease to limestone. For simplicity's sake, the carboxyl group may be considered jaws, and the attachment of gum to the stone similar to an locked onto its prey. The role of acids in etching a stone is to add strength to those jaws...or teeth to its mouth.

A Basic Table:

All etches are expressed in terms of drops of Nitric per ounce of gum Arabic.

WATER WASHES

	Light drawing	Medium	Dark Drawing	Black with Scratches
Korn's #00-4	5drops or less	10-17drops	17-40drops	25-40 drops
Stone's #00-4				
Washes made with Korn's stick Tusche	5 drops or weaker etches applied more than once	10-17 drops... Apply a weak etch multiple times.	20-25 drops Look for efervescence at about four seconds	Look for effervescence at four seconds and blot with a sponge.

Washes made with Stones tusche are able to take stronger etches than their counter parts. They are prone to reticulate at almost any saturation.

Students should be careful when applying multiple layers of tusche to consider that the grease content may be accumulating faster than the pigment.

SOLVENT WASHES

Tusche washes mixed with lithotine (paint thinner or mineral spirits) should assume there is a base of grease which must be broken through in all areas. That is, the reticulation (breaking into thick and thin deposits) that is characteristic of washes made with water, does not hold for solvent washes.

Tusche washes made with alcohol: Reticulation will occur, but the grease conent is elatively weak. Etches need to be adjusted accordingly.

Tusche washes made with lacquer thinner: Toxicity should dissuade students from using this approach. The grease content is distributed evenly, but weakened.

Tusche washes mixed with both water and solvent: A wide range of appearances can be made through exploiting compound mixtures. The results are difficult to predict and may require decisions o be made as the stone is rolled up.

STABILIZING THE STONE

One etch is not sufficient to stabilize a stone. The standard approach requires three etches with additional etches during editioning. The additional etches will be less and less necessary as printing continues because the stone becomes increasingly stable unless influenced by temperature change, ink consistency, or other outside factors. Gum massage with pure gum occasionally is helpful and allowing an etch to rest is important.

Students need to realize that gum is not only absorbed by stones, it is also chemically bound to the stone by "adsorbtion."

PROCEDURE FOR ETCHING THE STONE AND PREPARING IT TO PRINT

After the drawing has been completed — the first step before etching is to rosin the stone. The rosin dusts the surface of the greasy crayon with an acid resistant covering that also inhibits the water repelling nature of the greasy crayon, thus allowing the etch to get up very close to each individual crayon dot.

NEXT: Talc the image. This powder is much softer than rosin and will not scratch the drawing when it is buffed down with a piece of paper towel.

Prepare Your Etch: For most crayon work on stone, this table is sufficient for the first etch:

SEE TABLE ABOVE FOR GREATER DETAIL

Dark drawing: 18d Nitric to 1 oz. Gum Arabic
Medium Drawing: 12d Nitric to 1 oz. Gum Arabic
Light Drawing: 6d Nitric to 1 oz. Gum Arabic

Etch the stone: Keep the etch stirred at all times (acid is heavier than gum and settles to the bottom). Pour the etch on the border of the stone and work it with your hands to the center. Never pour the etch directly onto the drawing — it's a quick way to get etch marks in your drawing that will never disappear.

After you have worked the etch around on the stone for a couple of minutes, soak up the excess with a gum sponge and buff the etch dry with a cheesecloth. It is important to work fast and to keep flipping the cheesecloth to expose a dry section. Use small circular motions and just a little more pressure than the weight of your hand.

Fan the etch dry for a few minutes. It is important that the etch be completely dry before proceeding. If the etch is damp, parts of the image may not roll up properly or some areas of the stone may be insufficiently etched. It is best to let stone sit overnight at this point.

Washout the drawing with Lithotine or paste wax: Use plenty of lithotine or paste wax and paper towels until all of the crayon has been removed.

After the drawing is washed out, rub the stone up with printing base or leave in paste wax. This gives the stone a grease base that the roll up ink will adhere to. It doesn't take very much grease. All that is needed is a thin coat. The printing base should be applied to the stone and moved around with a paper towel pad until the image is covered. The film of grease/wax should then be buffed down with a clean paper towel.

Fan the printing base dry for a couple of minutes.

You are now ready to roll up the stone with ink. For this you will need the following:

- a. Leather roller and a rolled out slab of ink. (I recommend Senefelder's crayon

black as roll up ink - it is the stiffest and will give you the best results. Never use color ink for a roll up.)

b. Roll of paper towels.

c. Pans of water, cool clear water — 2 pans,

d. Sponges - size #8 yellow cellulose sponges

With a roller and slab ready - along with your sponges and water - wash the gum etch off with water. Use a pad of towels for this first step — the printing base / wax is on top of the stone and will get sponges very dirty - paper towels you can throw away, sponges get expensive.

Sponge the stone with water - use two sponges (1 coarse grained and 1 fine grained) carry the most water in the coarse sponge and have the fine one as dry as you can get it. The idea is to get the stone wet with the coarse one and then slick down as much water as you can with the fine one. There should be no standing water on the stone...just a thin film.

Roll ink on the stone with the roller. This will be done in steps. It is impossible to get the stone completely rolled up with one application of ink. You must alternate between sponging the stone with water and rolling it with a charged roller until the image is full. Be careful not to let the stone dry - if this happens, all of the stone will take ink, not just your drawing. For most normal crayon drawings you will probably have to charge your roller and roll on the stone about 6-10 times. These are called passes (i.e., it takes 6-10 passes to roll up a stone for the second etch).

After the image is rolled up well, sponge it down to a slick water film and fan the stone dry.

Rosin the stone - procedure is same as in step #1 for the same reasons - the only difference being, the rosin is now sticking to ink, not crayon.

Talc the stone. Same as step #2 - be sure to buff with a paper towel.

Prepare your second etch. For most crayon drawings a second etch of 10 drops of Nitric to 1 oz. gum arable will be sufficient. Be sure to keep it stirred and to start it in the border and work it towards the center as in step #4.

Buff the stone dry with cheesecloth it as in step #5.

Fan the etch dry. It is preferred at this time to let the stone sit overnight. This allows the gum to dry really well and to bond with the stone; however, if you are in a rush, let it sit for at least 15 minutes, then proceed.

At this point the stone should be taken to the press and the press set up to get ready to print. This next procedure is very important for it is the one that stabilizes the image on the stone so that no matter what color or how many prints you wish to pull, the image will remain the same.

(1) Take the leather roller, and without adding ink, roll it out on the glass slab until you have

only the ink that was on the roller rolled out.

- (2) Set the pressure of the press to very light, so that the scraper bar just touches the stone and you can feel a little pressure on the bar. Be sure the stone is centered and the scraper bar is the correct size.
- (3) Tear about 20 sheets of newsprint to the same size as the stone.
- (4) Get your sponges and pans of water ready.
- (5) Scrape some Senefelder's Crayon Black out of the can and work it up with an ink knife next to your slab. Do not add any to the slab at this time.
- (6) Wash the image out with lithotine as in step #7.
- (7) Rub up with printing base as in Step #8.
- (8) Fan printing base dry.
- (9) Wash the gum off with water, as in Step #11.
- (10) Sponge the stone, and slick down water film.
- (11) Roll on the stone with your roller that has very little ink on it. Return to the ink slab at least once (visit) and charge your roller. Change the pattern of your inking to place heavy deposits where thin deposits had gone earlier.
- (12) After you have rolled on the stone, pull a newsprint proof. The image will be very light as it should be. What you are doing at this time is getting the stone used to ink and water at the same time, without overdoing it with the ink and thus causing the stone to fill in.
- (13) Pull another newsprint proof - but this time increase the pressure a little bit. This time the print should be a little darker.
- (14) Add a little ink to your slab, and give the stone 2 visits.
- (15) Pull a newsprint proof. Do not add pressure.
- (16) Do not add ink — roll up stone - 2 visits.
- (17) Add some pressure and pull newsprint proof. As you can see, you are alternating between adding ink and adding pressure. What you hope to achieve is a set of newsprint proofs that range from very light to fully inked print in very gradual steps. After you have pulled a few newsprints, it will probably be necessary to go to more than 2 visits to get the image up to its full richness in the dark areas.
- (18) After the image is fully inked, add some ink to the slab and roll it up just as you did to pull the last print. This makes sure the stone is fully inked for the third etch.
- (19) Rosin and talc the stone.

(20) Give the stone a third etch - the same etch strength as the second is usually good. Areas that became too dark quickly should be spot etched with 17 drops of nitric per ounce of gum.

(21) Buff the etch down with a cheesecloth.

(22) Fan dry and let the stone sit for awhile — overnight is once again the best procedure at this time.

The stone is now completely ready to print in any color.