Intaglio

Hard/Soft Ground Etching

Further Information

A short film about etching featuring artist Kate Da’Casto. The film was made by Leicester Print Workshop in collaboration with Compton Verney. https://vimeo.com/187787524.

A short film featuring Kiki Smith with good examples of the states etchings go through as they are developed. https://youtu.be/2LHOBzikwx8.

The following historical and contemporary artists are suggested for further research into etching:

Rembrandt, Pablo Picasso, Jim Dine, David Hockney, Ian Chamberlain, Ian McKeever, Christopher Le Brun, Paula Rego, Mila Furstova, Denise Hawrysio

Introduction

The term Intaglio means to carve, cut out or incise and covers a host of traditional printmaking processes usually using metal plates (Zinc or Copper). There are two broad categories of intaglio processes; those that use an acid or mordant to bite into the plate; Hard or Soft-ground Etching; Aquatint; and Spit Bite; and manual processes that require the use of sharp tools to engrave directly in the plate; Drypoint and Engraving.

Hard-ground and Softground are both waxy acid resists that are melted and rolled onto the surface of copper or zinc to protect the metal from being bitten by acid. While Hardground becomes quite stable and can be handled with care once dry, Softground stays somewhat soft to the touch and should be handled with extreme care once it is coated on the plate.

Acids and Chemicals

The acids that are being used in the printmaking workshop are actually highly corrosive salts. Always wear gloves and goggles when handling the acid baths and follow the procedures as explained by the technician.

Never pour the acids down the drain as they will damage the plumbing and the environment! The acids need to be neutralized and the heavy metals filtered from them before they are disposed of properly. The printmaking technician is the only person that can do this.

We are currently using two different acids in the printmaking workshop. Ferric Chloride is only used for copper plates and Copper Sulphate is only used for zinc plates. It is important that the correct acid is used for the correct metal. The acid baths are clearly marked and you must pay complete attention to the task at hand when placing your etching plate in the bath.

White Spirit is a mild solvent that is used to clean the Hard-ground and Soft-ground off of the metal plates. You must wear gloves when handling White Spirit and turn on the ventilation fan when in use as the vapours are harmful.

Methylated Spirit is a flammable non-greasy alcohol based solvent used to degrease, remove rosin and some stop out varnishes from the metal plates. You must wear gloves when handling Meths and turn on the ventilation fan when in use as the vapours are harmful.

Health and Safety

White Spirit and Methylated Spirit can be absorbed into the skin and can poison the bloodstream, Always wear suitable PPE.
Preparing The Plate

Prior to etching, it is neccessary to thoroughly degrease the plate to remove any oxides or oils from the printing surface. Any contaminates will hinder the application of the ground and prevent the acid biting the plate correctly.

Polished Zinc plate is available through the Printmaking Stores in a variety of sizes and is the main type of plate used at WSA, however Copper may also be used. The technician will be able to advise you as to where you can purchase Copper locally.

01. Place your plate so the edge is overhanging the table by approx 2cm and hold it firmly in place.

You may wish to secure the plate down using a G clamp, alternatively applying weight with your freehand should be sufficient.

02. Using a file bevel all the edges of the plate at 45º bevel. This is to avoid damaging your print paper and the blankets of the press.

03. Put one drop of 3-in-1 oil on each edge and slide the burnisher along the edge to destroy the file marks. The edge should look polished when finished.

04. Wipe the oil from the plate and polish the top of the plate with Brasso.

05. In the fume cupboard give the plate a wipe with a clean cloth and small amount of white spirit and leave to dry for a few minutes.

06. Place your plate over the sink on the wooden draining board and give it a few squirts of Mr Muscle, shake a small amount of Whiting onto the plate to form a thick paste and rub well into the plate using a felt pad.

07. Rinse thoroughly with water and leave to dry. Avoid touching the surface of the plate and leaving greasy marks on it.

08. If any chalky residue remains from the whiting the plate can be given a final wipe with Methylated Spirits in the fume cupboard.

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1mm Polished Zinc Plate

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Scrapers and Burnishers for preparing the plate and making corrections.
Applying The Ground

The application of a Hard or Soft ground is the same. What you are trying to achieve is a thin, even layer of ground across the whole plate.

01. Turn on the Hot Plate to 80°C for Hard Ground or 50°C for Soft Ground.

02. Place your degreased etching plate on a sheet of newsprint on the hot-plate (to facilitate your ability to remove your etching plate easily).

The Hot Plate will take about 30 minutes to heat up. Replace the wooden grill over the Hot Plate while you are waiting.

03. Once your etching plate has warmed up you should be able to melt a nice puddle of the ball ground onto it.

04. Use the dedicated brayer for the hard or soft ground to spread the ground over the warmed plate.

05. Roll the brayer/ground in one direction initially to spread. Avoid hitting the newsprint with the brayer to prevent losing ground and creating streaks in the ground on the plate.

06. Continue to spread the ground with the brayer with the goal of achieving an even coat. Apply more ground if required but be careful not to apply too much.

The Brayer will start to slip over the plate surface if there is too much ground on the plate. To overcome this move your plate to a cooler part of the hot plate and roll any excess ground off the brayer onto the spare ground plate.

07. Gradually lightening pressure on the brayer will spread the ground, reducing roller marks and pinholes.

08. Once you are happy that the ground is even on your plate, grasp the newsprint on diagonal corners and lift the plate from the hot plate and allow it to cool.

09. Roll off any excess ground from the warm brayer onto a clean sheet of newsprint and return the brayer and ground disc to the cupboard.

10. Reset the Hot plate Temperature to 0°C, turn it off at the isolator switch, and replace the wooden grill.

You will need
- Hard or Soft Ball Ground
- Ground Roller
- Newsprint
- Your Degreased Etching Plate
- The Spare Ground Plate

Health and Safety
Never leave the Hot Plate unattended! Improper use may cause burns to yourself and fellow students.
Always ask the technician before using the Hot Plate.
Drawing on the plate

**Hard-ground**

For Hard-ground, use any sharp tool to draw an image on the plate. A sharp diamond point scribe will create very fine lines. More blunt tools, such as a paper clip or sharpened nail will create wider lines. Be sure to scratch completely through the waxy ground, so that the metal is exposed without scratching into the metal itself, to allow the acid to properly etch the line.

The lines that are scratched in the Hard-ground will be bitten by the acid. The acid will bite straight down into the metal. When the plate is inked and printed it will produce a very crisp line, by leaving the plate in the acid for longer periods of time a heavier thicker line is achieved.

**Image Transfer**

While it is possible to draw directly onto the plate with your etching needle you may prefer to draw a guide onto the plate to better allow you to work from a preplanned image. When using hard ground by far the easiest method of copying your image across to the plate is by using transfer paper.

After you have applied hard ground to your plate simply lay a sheet a transfer paper face down on the plate with your drawing face up on top of it (Remember, once printed, your drawing will be a mirror image to what you draw onto the plate). Fix the papers to the rear of the plate with tape so they will not slide or slip while transferring the drawing. Redraw the image on the paper using something like a hard pencil or a fine tip biro. Once you have completely redrawn the image remove the papers and use your etching needle to draw over these easily visible lines on your plate.

**Creating Marks**

In line etching tonal values are emulated through the use of hatching and cross hatching. Hatching is the technique of creating a series of closely spaced parallel lines with a etching needle. When a second series of lines are added and placed at an angle dissecting these first lines it is called cross-hatching. The main concept of hatching is that the quantity, thickness and spacing of the lines will affect the brightness of the overall image, and emphasize forms creating the illusion of volume. By increasing quantity, thickness and closeness, the darker the area will appear.
Open Bite
If you are wishing to achieve a large solid area of colour or shading, simply removing the ground would not be sufficient and would result in the edges of these areas holding ink, making a dark, irregular line, but the open areas will hold much less, yielding a mottled tone. This is called Open Bite, and while it is a technique in its own right, it is also the result of not understanding the limits of drawing techniques in etching.

For a variety of techniques to achieve solid tonal areas in etching please see the ‘Aquatint’ guide.

Soft-ground
Once a plate is coated with Soft-ground a thin sheet of paper can be laid over and drawn on with a pencil, the pressure of the pencil will lift the ground, leaving a line that emulates the texture of a pencil line once etched.

Different weights of paper and hardness of pencil will affect the quality of the line. When drawing it is helpful to tape the paper onto the back of the plate so it can be lifted to check your progress as you draw.

Fabrics can also be impressed into the Soft-ground to produce interesting textures. To do this, the soft-ground plate is placed on the bed of the press. Fabric is set on top of the plate and run through the press to impress the fabric design in the soft-ground. The plate is then bitten in the acid bath to create the texture on the plate that can then be printed.

Health and Safety
Always ask the technician to set the press for you before attempting to impress fabrics into Soft Ground.
Etching The Plate

01. Carefully lay the plate face down and cover the back of the plate using the adhesive vinyl shelf paper to prevent the back of the plate from etching.

02. Use packing tape to create a strap on the back of the plate.

03. Use the etching calculator to determine the etching time required to achieve the desired weight of the lines.

04. Lower the plate into the acid bath making sure the entire plate is submerged in the acid. Wrap the tape over the ledge of the etching tank so that the plate is hanging in the tank.

05. Once the plate has been etched for the desired time, carefully lift the plate from the etching bath and let the excess acid drain off.

06. Dip your plate into the water bath and carefully feather off the sediment deposit from the plate surface.

For etching times exceeding 10 minutes the plate should be periodically lifted from the acid and the sediment deposit removed to ensure the lines bit evenly across the plate.

07. Wash off the plate under the tap and dry.

08. Use White Spirit and a solvent rag to remove the ground from the plate.

Stage Biting

It's possible to create variation in the weight of the line in your print through stage biting the plate. The longer the plate is exposed to the acid the denser the weight of line will be. By selectively stopping out parts of your drawing you can create various strengths of line on a single plate.

- Etch for the shortest amount of time, rinse and dry the plate with a fan.

- Stop out the lightest areas of your drawing using stop-out varnish.

- Once the stop-out is dry, etch the plate further taking into account the time you have already etched the plate and by using the etching calculator.

- Continue stopping-out and etching until you are satisfied.

You will need
- Black Rubber Gloves
- Eye goggles
- Packing Tape
- Alarm clock/Timer
- Feather
- Etching calculator

Etching calculator

Stage bit line bite

Etching calculator

Stage bit line bite
You will need
- Etching Ink and modifiers
- Card Offcuts
- Scrim
- Phonebook pages
- Printing paper
- Newsprint

Printing
Etching plates should be printed on either the Hunter Penrose or Rochat etching presses.

01. Tear your paper to size, and soak for at least 20 minutes before printing. Asian papers should not be soaked.

02. Prepare your ink, Black ink can be mixed with a very small amount of easy wipe. Colour inks will need to be mixed with easy wipe and a small amount of etching extender.

03. Card on your ink, and skim off the excess. With a dirty tarlatan that is held in a tight ball, wipe in a circular motion pushing the ink into the plate.

04. Sweep the tarlatan across the plate from different directions, Be careful not to apply too much pressure and over-wipe the plate.

05. Once there are no streaks of ink remaining on the plate, finish wiping your plate with a phone book page to remove excess plate tone. Wipe edges carefully and thoroughly.

06. Clean your hands!

07. Blot your paper between the towel, using the roller,

08. Position your plate and paper and lay a sheet of clean newsprint on top. Position the blankets and send through the press.

09. Clean the press bed with Mr Muscle after pulling each print.

Drying Prints
The best way to dry your prints after they come out of the printing press is to lay them flat between two flat boards, creating a sandwich that can then be weighted down. If you dry your prints on a drying rack because of the large amount of water trapped in the paper you will find they will buckle as they dry. Drying racks can be used initially but be sure to press them flat using drying boards for the best results.

Place a sheet of blotting paper down on the bottom board with your print ink face up. On top place a sheet of newsprint to avoid marking them and to allow for some of the water to be leached out as they dry. Continue stacking; blotting paper; print and then; newsprint then place another drying board on top with weights.

If possible the print should be left like this for several days and ideally the papers on each side should be changed as the print dries.

Health and Safety
Improper use of the press can cause serious injury and damage the equipment. Always ask the technician to set the press for you.
Clean Up

01. Dispose of any card scrapers in the bin and return the Scrim to the rack.

02. Clean the press bed with Mr Muscle and wind it back into the middle.

03. Put on a pair of (Black) Cleaning Gloves.

04. Clean the plate, in the fume cupboard with a toothbrush a and little white spirit and dry with paper towel. Make sure you turn on the vents!

05. Scrape the excess ink off the slab with your ink knife and wipe it onto phone book pages.

06. Pour a small amount of vegetable oil onto the slab. With a dirty rag, wipe down the ink knives. Ensure you remove all the ink. Give them a final wipe with a clean rag.

07. Use the same rag to wipe up the oil and ink on the slab and then put it in the appropriate rag bin.

08. Use Mr Muscle and a blue J cloth to clean up the greasy residue on the glass slab.

09. Put everything back in its place. Newsprint, inks, bottles, rollers etc!

Thank you for leaving the studio clean and tidy for the next person!