

A screen is made of a piece of porous, finely woven fabric called mesh which is stretched over a frame of aluminium or wood. The mesh count is the number of threads per inch (tpi) used to weave the mesh. The mesh count affects the thickness of the ink deposited when printing and the size (or lpi, lines per inch) of halftones that can be printed i.e. the detail of your image.

Lower mesh counts (typically 43) are used for printing on textiles as there is more space between the threads (called the open area) so more ink can pass through the screen and be deposited on the fabric

Higher mesh counts (typically 90 -120) are used for printing on paper as paper is a less absorbent surface.

Ink is passed through this mesh using a squeegee. Different substances and materials are used to make stencils, which block the mesh and stop ink printing in that area. There are many different ways of making a stencil (from cut out to hand drawn to computer generated) some examples of which are up around the print rooms. The most common stencils are photomechanical. This is where a screen is coated with emulsion, which is sensitive to ultraviolet light. A transparent positive is used to expose your image on the screen. The opaque areas block the UV light and the transparent areas let it through. Where the UV light is allowed through it fixes the emulsion making it insoluble in water, where it is blocked by the opaque parts of the positive it is not fixed and therefore will wash out when rinsed in water, unblocking the mesh, allowing ink through and thus creating your stencil.

### **Coating a screen:**

- Prep the area:
  - Newspaper, Emulsion, Trough, Tissue, Spatula, Screen (make sure it is in stable position)
- RED LIGHT ON / MAKE SURE SIGN ON DOOR  
The emulsion cannot be exposed to anything other than red light otherwise it will be ruined.
- Get out emulsion and stir (only with wooden or plastic implement) Pour a thin line of emulsion along the whole length of the trough but don't fill it all the way to the top.
- Put the trough at the bottom of the screen so that the lip is touching the mesh and make sure that the emulsion is level.
- Tilt the trough so that all of the emulsion is touching the mesh then begin to slowly and steadily drag it up the screen.
- When you get near the top of the screen tilt the trough back so the emulsion runs back in then scrape the trough up and off the screen.
- The trough can be scraped up the screen to remove any excess emulsion, leaving an even coat.
- Scrape emulsion back into pot and wash out trough. Store screen to dry for approx 2.5 hours in warm, dry, dark place. The coated screen cannot be exposed to anything other than red light otherwise it will be ruined.
- DO NOT TOUCH the emulsion on the mesh at all

### **Exposing a screen:**

- Preparation of transparent positive: can be made in many ways (hand drawn, found objects, photographic images etc...) which is then printed or photocopied onto OHP/Acetate. (Photocopies require 2 copies backed together, due to poor density and darkness of photocopier inks)
- RED LIGHT ON / MAKE SURE SIGN ON DOOR
- Turn on (system on button) exposure unit, make sure set to 44 and run through once so it warms up.
- Put transparencies on exposure unit the way you want them to print, place screen on top mesh down.
- Put touch up screen on to check position of transparencies – make sure not too near the edge.
- Close top of exposure unit, lock down both sides and put the vacuum on.
- Press start
- When count down is completed – turn off vacuum and wait for it to release before opening exposure unit and removing your screen

### **Washing out:**

- Normal lights can now go on
- Take screen to wash out room as soon as possible
- Use soft setting on hose to wet entire screen on both sides and image should appear, continue until all of image is free of emulsion. DO NOT SCRUB AS YOU WILL BREAK UP YOUR IMAGE
- Leave to dry

Tip: if you are doing a large print run it might be a good idea to put your screen back in the exposure unit and run it through to make the stencil more durable.

Examine your screen once it is dry to look for any imperfections or holes that may need filling in with screen filler.

**PLEASE NOTE THAT FROM NOW ON THE TWO PROCESSES (PAPER AND TEXTILES) DIFFER CONSIDERABLY**

**PLEASE NOTE IT IS VERY IMPORTANT NOT TO MIX TEXTILE INK / BINDER WITH PAPER INKS / MEDIUM AS IT WILL RUIN THE SCREENS AND AS THEY ARE USED IN VERY DIFFERENT QUANTITIES YOU WILL NOT GET A DECENT PRINT.**

## PAPER PRINTING

### **Mixing Inks:**

Most paper screen-printing studios nowadays use water based acrylic screen inks, as it is less odorous and easier to clean up. Colours are mixed with an 'extender base' or 'medium'. This allows you to mix inks in a complete tonal range from almost transparent to completely opaque.

- Standard ink mix is 50:50 acrylic ink and medium. Any less and the inks will dry in the mesh which means your image will not print and could result in the screen being damaged
- For a translucent ink mix increase the medium content to something like 80 medium, 20 ink
- Process colours or CMYK colours (Cyan, Magenta, Yellow and Key (black)) are inks specifically for printing four colour separations. They are translucent and are mixed at 70% or 80% medium to 30% or 20% ink.
- Once you have mixed your ink it should flow freely, if it is too sticky water can be added until the correct consistency is reached.
- To prolong the life of your inks and prevent them from drying out keep them as sealed as possible from the air.

Tip: always test your inks on a scrap of paper and you should be able to see how translucent / opaque they are (see studio examples)

Tip: always start by mixing a small amount of ink so you have room to add more ink/medium if necessary

**Clean everything with water immediately after printing or mixing. Once ink has dried it is waterproof and will not come off things easily**

### **Printing:**

- Get everything ready:
  - ✓ Inks mixed correctly
  - ✓ Paper to print on (trimmed to size)
  - ✓ Squeegee that is bigger than your image but fits inside the screen
  - ✓ Newsprint (to cover vacuum table and to test print on)
  - ✓ Masking Tape
  - ✓ Space in drying racks
  - ✓ Clean place to put your paper
  - ✓ Sponge and bucket of water
  - ✓ Palette knife

Tip: Have more paper than you intend to use for your edition to cover any mistakes or troubleshooting that may occur.

- Tape up your screen around the edges and if you have more than one image on a screen mask off the ones you are not using. All this prevents ink dripping through onto your paper or drying out in your other images.

- Clamp your screen into the frame. Make sure it is secure. **Always make sure you move your screen under the frame rather than over the top as this is less dangerous in terms of damage to the mesh.**
- Registration: Tape a piece of acetate to the printing bed so that it is under the image you wish to print. The first print you pull will be onto the acetate which will then be used to register where you want your image to go on your subsequent prints.
- Mask off the area of the table you are not using with newsprint. This will maximise the suction in the area you want to print and make clearing up a lot easier.
- Lay a line of ink (approx 3cm/1inch thick) above or below your image. Be generous and make sure that the line of ink is wider than your image.
- Lift up the screen and with the squeegee push the ink gently away from you at an angle of approx 45 degrees so that the mesh is filled with ink. This is called flooding.
- Put the screen down on the bed and pull the ink across the screen with the squeegee as before at 45 degrees being careful to keep the pressure even.
- Lift up the screen and flood it again leaving the frame resting up while you remove your print and place it on the drying rack.

Tip: the flooding process is important as it prevents the screen from drying out (but do not leave it for too long as it will after a while!) When you flood the screen you are depositing a layer of ink which will then be transferred to your paper when you pull your actual print. It is important therefore that you flood the screen evenly and generously.

### **Cleaning Up:**

- Scrape all ink up off the screen and squeegee and return to pot if possible
- Wash squeegees and palette knives with water.
- Place newsprint below screen and wash out screen with sponge and water until there is no ink left in the mesh and it looks as clear as it did before you started printing (if you are not sure hold screen up to light to see if anything is blocking the mesh) Make sure you clean both sides of the mesh.
- If you are printing another image from your screen allow screen and prints to dry thoroughly before starting printing process again.
- If you are finished with your screen remove from frame (under not over) and store safely (if you are completely finished with it remember to wipe your

name from the screen reservation sheet and remove all tape from the screen so that it can be reclaimed)

- Make sure all your rubbish is in the bins and the printing table and other equipment is clean (remember to wipe acetate)

### **Stripping the Stencils off the Screen after use:**

- Remove all tape from the screen
- Put on gloves, goggles, face mask, protective jacket and ear defenders.
- Apply stencil remover to screen and scrub it all over (front and back) with the brush provided.
- When stencil is dissolving, wash out with high pressure washer.
- Dry screen and store safely.

## **TEXTILE PRINTING**

### **Mixing Inks:**

We have chosen to use spirit based textile inks and binder as the colours are brighter and you will get a softer finish (they do clean out with water though) Some studios might use water based binder but the principles for mixing inks is the same regardless. Ink is mixed into the binder very sparingly a drop at a time until the desired shade is reached. For a full strength shade mix 9 parts binder to 1 part ink. Tip: To prolong the life of your inks and prevent them from drying out keep them as sealed as possible from the air and cover them as soon as you have finished using them to prevent the spirit from evaporating.

Tip: test your ink on your material as it could alter the shade of it

Tip: opaque binder can be added to create solid blocks of ink when you are overlaying colours (without it inks are normally translucent and overlaying will create a different shade)

**Clean everything with water immediately after printing or mixing. Once ink has dried it is waterproof and will not come off things easily**

### **Printing:**

- Get everything ready:
  - ✓ Inks mixed correctly
  - ✓ Material to print on
  - ✓ Squeegee that is bigger than your image but fits inside the screen
  - ✓ Masking Tape
  - ✓ Space to dry material
  - ✓ Sponge and bucket of water
  - ✓ Palette knife

Tip: Have more material than you intend to use for your edition to cover any mistakes or troubleshooting that may occur.

- Tape up your screen around the edges and if you have more than one image on a screen mask off the ones you are not using. All this prevents ink dripping through onto your material or drying out in your other images.
- Speed is of the essence as inks will dry out screens really quickly. When using the opaque (white) binder it is especially important to wash out your screen as soon as you have stopped printing as it dries quicker than the others. This also includes inks that you have mixed in with the opaque binder.
- Lay a line of ink (approx 3cm/1inch thick) above or below your image. Be generous and make sure that the line of ink is wider than your image.  
DO NOT FLOOD THE SCREEN AS YOU DO IN PAPER
- Put the screen down in the correct position on your material. Collect the ink in front of the squeegee and pull it across the screen keeping the pressure even and the squeegee at an angle of 45 degrees. You will have to test the number of pulls you will need as it will depend upon the thickness / texture of your material.
- Move on to your next bit of material and repeat process

Tip: If you are printing with a large screen you may need somebody to hold it down for you.

### **Cleaning Up:**

- When you have finished printing scrape any excess ink back into the pot and take your screen to the wash our room and clean it immediately (if you are completely finished with it remember to wipe your name from the screen reservation sheet and remove all tape from the screen so that it can be reclaimed)
- Textile inks will dye the screen mesh so don't worry!
- Wash squeegees and palette knives with water.
- Make sure all your rubbish is in the bins and the printing table and other equipment is clean.
- If you are continuing to print allow the screen and your material to dry thoroughly before moving onto the next image/layer and make sure the room is adequately ventilated if doing larger runs.

### **Stripping the Stencils off the Screen after use:**

- Remove all tape from the screen
- Put on gloves, goggles, face mask, protective jacket and ear defenders.
- Apply stencil remover to screen and scrub it all over (front and back) with the brush provided.

- When stencil is dissolving, wash out with high pressure washer.  
Dry screen and store safely.

### **Fixing in heat press:**

- Once you have finished printing your product it will need to be fixed using the heat press to prevent theinks from running / transferring.
- Switch on heat press at plug socket, set to 140 degrees and allow to warm up fully.
- Place material face up on bed of press and clamp down top fro approx 2-3mins (lift up and check after 2)
- Coloured fabrics and synthetic mixes can scorch so be careful.
- Large blocks and thick areas of colour might need longer in the heat press

TIP: Fabrics will be fixed after being in the heat press but hand wash them or use a gentle washing cycle to retain the colours. Printed areas will be softer after washing (with the exception of areas where the opaque binder has been used)

TIP: Some colours may change slightly after they have been heat pressed (particularly reds) so please test beforehand to make sure you are getting the colours you want

TIP: You can iron your prints to fix them if a more delicate controlled heat source is required.

**DO NOT PUT THINGS THAT MIGHT MELT IN THE HEAT PRESS**  
**DO NOT PUT FINE SYNTHETIC MATERIALS IN THE HEAT PRESS AT HIGH TEMPERATURES**  
**DO NOT LEAVE THE HEAT PRESS UNATTENDED**

## **\*IMPORTANT INFORMATION\***

- Please make sure you bring enough money with you to your sessions to pay for materials and your time. We do not have a card machine currently but we do accept cheques and there is a cash machine about 10 minutes walk away from the building. If you are not sure how much your session will cost we can do a quote for you when you book.
- If you book sessions please turn up to them or give adequate cancellation notice. PTTP accept that people get ill or unexpected things crop up but if a habit is made of booking sessions and not turning up or not cancelling then this may result in your membership being terminated.
- It can get cold and inky down at the Print Rooms so please dress appropriately
- PTTP are not responsible for the loss or damage of personal items brought into / left in the Print Rooms by users.
- Please do not leave work /materials in the Print Rooms unless you have negotiated a different collection time with a technician. Any work / inks left will be recycled!
- It is your responsibility to leave the Print Rooms and equipment as clean as you found them and report any damages etc... to technicians.
- If you decide to leave the Print Rooms before your years membership is up, PTTP regret that we will not be able to refund your membership.
- As a new and self funded venture we are not able to stock as much as we would like in our shop but if you give us adequate notice we should be able to order most thing in for you. Most things if ordered by a Thursday will arrive on a Tuesday but please speak to a technician for more details.
- Please make sure you have your artwork ready for your session.
- If you are not happy (or if you are happy!) with the service provided by PTTP please let us know. We are a new venture and we would appreciate your feedback in letting us know how to improve and move forward.

## **RESOURCES / LOCAL SUPPLIERS**

General Materials:



**Norwich Art Supplies:** 16 St Benedicts Street, Norwich, NR2 4AG  
01603 620229

<http://www.norwichartsupplies.co.uk/>

**Jarrolds:** 5 London Street, Norwich, NR2 1JF  
01603 660661

<http://www.jarrold.co.uk>

Very Nice Chap makes screens to order:

**APH Screens :**

Unit 26, Ellough Industrial Estate, Ellough, Beccles, NR34 7TD

01502 715 457

<http://aph-screen.co.uk/>

Printing:

**Print Room:** City College Norwich, Ipswich Road, NR2 2LJ

01603 773089

Situated behind the staff car park at CCN these lovely people will print acetates (only up to A3) while you wait for just £1!

For bigger acetate prints:

**Saxon Digital Services:** For the best prints onto acetate in the land  
Saxon House, Hellesdon Park Road, Drayton High Road, Norwich, NR6 5DR  
01603 789560

<http://www.saxondigitalservices.co.uk>

[info@saxondigitalservices.co.uk](mailto:info@saxondigitalservices.co.uk)

**Service Point:** Print on to tracing paper

27 Prince of Wales Road NR1 1BG

01603 660 061

<http://www.servicepointuk.com/sp-uk/norwich>

**STENCILS**

There are different names given to the stencil, which is basically the design you want to print: acetate, transparency, positive etc....and there are different methods of creating it:

- STENCIL 1: design is cut out of thin card or paper, then attached to the bottom of the screen. Instantaneous in results but does not last very long.
- STENCIL 2: Design is painted directly onto the screen using screen filler which when dry will resist the ink. This method can give you a painterly feel to your image but it is difficult to correct mistakes.
- PHOTOMECHANICAL: A photosensitive emulsion is used to coat the screen and the design is exposed on to the screen using an exposure unit and a transparent positive.
- TRANSPARENT POSITIVE 1: Hand Drawn: Design can be hand drawn or painted onto acetate, drafting film or tracing paper. There is quite a lot of creative scope in this method: rubbings can be taken or marks made using different techniques can be transferred (mono printing, woodcut etc...)
- TRANSPARENT POSITIVE 2: Design printed out using laser or inkjet printer onto acetate.
- TRANSPARENT POSITIVE 3: Design photocopied onto acetate. Please note that photocopies need to be stuck together as photocopiers do not lay down ink dense enough. Photocopies onto paper can also be used if baby or vegetable oil is applied to their surface before exposure (this is messy!)
- TRANSPARENT POSITIVE 4: Photographic Images: Created in Photoshop using halftones (to create continuous tone from black and white like in newspapers) or four colour separations (CMYK to get a photo realistic image) then printed out onto acetate.
- **REMEMBER** : When designing your stencils ink will come through areas that are opaque (non transparent). Separate layers need to be done on separate transparencies and print outs onto acetates need to be a dense black and non streaky.