The Fundamentals of Temperaprint.

Alex Chater & Peter Fredrick

In the beginning there was the egg.

Eggs have been used as a binding medium for pigment paint since primitive times. This book is all about using eggs to make light sensitive emulsions containing pigment. Worked photographically, these have the surface quality of a classic Egg-Tempera painting, giving the process its name.

The process is applied to a suitable substrate in a very similar manner to Egg-Tempera painting. The image is built up layer by layer. Often several layers going to make a single coat, and a number of coats to make a final Temperaprint.

Process Outline.

Before you start Make sure you have a safe, clean environment

1	Have all the tools and materials you need at hand
2	Prepare the egg
3	Make a saturated solution of ammonium dichromate, SAT/SOL
4	Make a Standard Emulsion Mix, (STEM)
5	Add colour to the STEM
6	Coat the Yupo/substrate with Coloured Temperaprint Emulsion
7	Dry the coated Yupo/substrate
8	Register the Yupo/substrate to the negative to be printed

9	Load the registered Yupo/substrate plus negative into contact Frame
10	Expose to a light source rich in Ultra-Violet radiation
11	Develop
12	Clear
13	Final wash
14	Dry

Introduction
In this chapter we will cover the fundamentals of the process and find out how we can safely and effectively set up and make Temperaprints. By following the guidance in this fundamentals chapter, step by step, you will without reference to the rest of the book, produce a good Temperaprint. It will be precise and practical. However we will not go into any more detail than is necessary, preferring instead to inform you of the basic major considerations, which underlie the working practices of the process.

We will cover the manufacture of the Temperaprint emulsion, how to coat that emulsion, the exposure, wash off and final clearing of the residual dichromate stains ready to lay on further coats. Where possible specialist techniques will be covered in their relevant chapters and can be considered once you have achieved an understanding of these basic fundamentals.

Temperaprint Emulsion
The Temperaprint emulsion is a light sensitive compound and as such needs to be worked in a safe light situation, such as any other photographic emulsion, but it is nowhere near as sensitive as regular photographic materials, so the normal darkroom requirement does not apply. Sun and daylight must be completely excluded. You should work by the light of an ordinary filament light bulb not stronger than 100 watt at a reasonable distance and not fluorescent tubes. You will need to see what you are doing so don't handicap yourself by being to mean with the light, but don't be unaware of it either. The mixture is light sensitive. The emulsion itself consists of three major parts, whole egg, sensitizer and colouring matter. The following descriptions will take you through the sequential construction of this emulsion.

Before you begin to print, read through the environment sections of the fundamentals chapter and ensure that you have suitably prepared the environment and have in place all the tools.

Preparing the Egg
Tools Materials
Three large eggs
Sealable container
Tea strainer preferably stainless steel
500ml Measuring vessel

Break three eggs into a sealable container that is large enough to allow plenty of room for the egg to splosh about. Once sealed shake the container vigorously to mix up the egg into a uniform liquid state.
Always use the freshest egg possible. Store bought eggs work fine providing they are fresh.
A fresh egg will have a strong sac and will form a firm mound. Over time, the sac weakens, as does the binding strength of its contents.
The type of egg used can also affect binding strength. Fresh eggs from free-range chickens will produce a stronger binder because of the rich, viscous yolks.

Though appearing uniform the egg will have small clots, the yoke sack, speck etc. and possibly pieces of eggshell that have fallen in. So it will be necessary to remove these. Filter the egg through a fine tea strainer into the measuring vessel, remove the strainer as soon as the flow has dropped off and wash. What you will see are the white stingy clots and yoke sack washing away down the sink.
If this raw egg is not correctly filtered these stringy semi-clotted parts of the egg will pass into the emulsion stage where they will get up to all kinds of mischief, on to the roller and coating area and form irregular lighter patches or blotchiness to appear in the print.
It is sound practice, to make sure that you wash and put up to drain and dry all the tools [such as in this case the sealable container, measuring vessel, tea-strainer] at the end of each stage.

To make a Saturated Solution
Tools materials
Safelighting 100watt filament (household bulb)
Clean sink with running water
Glass container with a sealable lid.
Distilled water
Protective Gloves
Ammonium Dichromate powdered chemical,
Dark brown glass storage container
5ml spoon preferably stainless steel

A saturated solution is where, water reaches a point at which it is unable absorb any more of a dissolvable chemical, and becomes saturated. Once this condition is reached any further additions of the chemical will not be absorbed and it will just sit on the bottom of its container until further water is added. A saturated solution will always be the same, and is therefore known and constant.

You can use bottled, de-ionised, or still spa water for the purpose. The best water to use is distilled water. Never use tap water! To this water is added Ammonium Dichromate, which is the actual sensitizer. It is these chemicals when mixed with a colloid such as egg. That has the effect of hardening the colloid in direct proportion to the amount of light that it receives. Rendering it insoluble or tanning as it is sometimes described. Making a saturated solution is a very easy task. Work cleanly and keep the chemistry contained to an area that can be cleaned, and has running water such as a sink, and wear protective/disposable gloves. Take a glass container with a sealable lid and add 100ml of pure water. To this add two heaped spoons of Ammonium Dichromate crystals and close the container. You will notice that the water turns yellow and that the crystals are sitting on the bottom, now agitate the container for thirty seconds. To check your progress let the crystals settle. The fine dust like particles will have dissolved away first, so what you should see when it clears is just the larger lump's looking rather like sugar crystals in water. Once most of the crystals have dissolved, add another heaped spoon and continue to agitate, checking periodically on your progress. When you notice that the fine particles remain, as slurry on the bottom, and no amount of agitation will get them to dissolve, the solution is now saturated.

Keeping the glass container sealed, wash under running water to remove any sensitizer that may have escaped or is trapped in the threads of the lid and clean up the area.
In this saturated state the solution will last for months provided it is kept from the light in a dark brown glass container To maintain the saturated solution, add more of the distilled water or Ammonium Dichromate, always ensuring that a fine slurry of crystals is present on the bottom.

Again make sure that all the containers and tools you have used are washed up and put to dry

Issues and Concerns

All chemistry can be considered potentially dangerous and therefore should be treated with respect.

1. You should not inhale the dust
2. Use protective or disposable gloves when mixing the sensitizer
3. Remove any splashes on your skin immediately

STEM
STEM stands for Standard Emulsion Mix, (STEM). It is a mixture primarily of the whole egg with Ammonium Dichromate, which is our sensitizer. Each part needs to be prepared separately and then brought together in the right proportions. It is at this stage of the process that the STEM can be adjusted for particular working characteristic. Though not complicated in any way, it should be born in mind that it is
important that the measuring is done accurately for results to be consistent**.**

Assembling the STEM
Tools materials
Sealable container
500ml Measuring vessel

To complete the STEM, measure out a **100ml** of the filtered liquid egg into a sealable container. Now add **50ml** of saturated sensitizer solution. Seal the container and agitate vigorously for ten to twenty seconds to ensure that the two liquids are fully mixed. When you open the jar you will see a frothed up orange liquid .Do not worry about this, the froth soon settles down. This is the basic STEM mix and is transferred into a measuring jug.

It is at this stage that various adjustments can be made to the basic STEM. Other constituent's such as plasticizer's flow enhancer's, other elements, and colloids can be added to improve performance. When working the process at an advanced level and is fully explained in the relevant appendix

Only make up enough standard emulsion for one printmaking session of say three hours duration. Given time this emulsion will spoil due to dark reaction effects that are similar to the way that milk goes sour with time and temperature. Therefore the STEM must be discarded at the end of each print session even you have made up a large quantity. IT CANNOT be stored for later use.

Again make sure that all the containers and tools you have used are washed up and put to dry.

Colouring the STEM Solution
The colouring of the STEM can be done in a number of ways using a variety of colouring materials. In this initial method, we will use a painting medium to colour the STEM solution, {which we now call the Temperaprint Emulsion.} artist quality acrylic paint is employed. There are many different brands and all will work; though some may not be as strong in pigmentation as others may. We use an acrylic paint known as Liquitex in little bottles and jars. A highly concentrated colourant which is added in a fixed proportion by volume to the Temperaprint Emulsion.
You may also use raw powdered pigments, or watercolours in which case you may wish to add acrylic when assembling the Temperaprint Emulsion. Omission of this element is not a catastrophe. It only means that the resultant image that you get after you have exposed and washed off will be a little softer both in edge and in its physical properties. Dyes are not normally suitable for use, despite the fact that they are water based and will work. Almost all dyes are fugitive and therefore of no real value in a system that has great archival potential, such as Temperaprint

Tools Materials

1/2 inch Brush
STEM solution
Bottle/jar of Acrylic Paint [Liquitex]
5ml Measuring Spoon preferably stainless steel /or a syringe without needle
Small Pallet Knife

Take the 5ml spoon and squeeze out or pour enough paint to make a level spoon full of paint, if necessary use the pallet knife to ensure accuracy. A very accurate alternative method is to use a 5ml plastic syringe.
Now use the brush to move the paint into a suitable container or the paint tray. Add 5 ml of the STEM solution and begin to work the paint and STEM solution into each other until they are thoroughly uniform and mixed. Now add a further 5-ml and again work them together. The important issue is to ensure as even dispersion as possible, and not to end up with clumps of pure paint sitting in the bottom of the container or paint tray. Initially this means working the paint from it original stiff consistency to a liquid through a series of additions. As this progresses it will get easier to mix together as the mix becomes more and more fluid.

There can be few hard and fast rules to the correct amount of colorant to STEM solution as the variables in the supply are just too vast. Experience and getting to know your materials is in practice the only sure way of knowing absolutely.
It is important to remember that there are two ways to change colour saturation or tonal density. One is to increase or decrease the amount of pigment in the mix. Or secondly to print a number identical coats one on top of the other in a multiple layer approach. In practice you will tend to use a mixture of both these methods. However it is noticeable that once the ratio drops below five parts STEM solution to one part paint the working characteristics start to radically change. Coats will become heavy, exposure time will be significantly increased and the contrast will become excessive until eventually you are unable to gain a good even coat or exposure.

The following provides a general guide to the limitations of how much colourant it is possible to load into a coat: -

Use one level spoonful of acrylic paint as a standard unit of measure i.e. 5 ml: -

Chromatically Spoons of Emulsion

Strong Four
Medium [normal] Six
Thin Eight
Glaze Twelve

It is very important to measure these quantities carefully, and consistently, What has to understand, is that this coloured Temperaprint emulsion. Is not just some messy paint, but in fact a precise photo-sensitive emulsion.

Again make sure that all the containers and tools you have used are washed up

and put to dry

Coating
Introduction
No coating system is without its problems; in fact the main reason that the photographic manufacturers gained dominance historically is that they could successfully coat photographic materials to a high level of perfection, by the application of precise mechanical factory technique

The principle custom hand coating methods can be summarised as follows: -

Airbrush,
Brushing hair/foam,
Buffing,
Dip or float on methods,
Foam roller systems,
Glass rod
K/Graber bar,

At the moment our favoured coating tool is the foam roller. Many years have been spent refining the technique to get the exact balance in the egg emulsion to print onto a sheet of Yupo/substrate. The foam roller has one defect when used on a smooth non-absorbent substrate such as Yupo [laminated polypropylene] it gives a pronounced texture. These footprints of the foam will normally need two or three coatings to disappear and give a smooth full-bodied colour. This is the system that will be explained and used through out this book
What has to be born in mind that this process works best in a multiple layer manner! Several layers often go the make a single coat and a number of coatings go to make the final image. So the foam footprint will tend to disappear quite rapidly of its own accord as printmaking progresses.

The substrate.

Choice

The relationship between the emulsion or paint and the surface quality of the substrate onto which it will be laid is extremely complex. They both need to be matched very carefully. Rather like a hand snugly fitting into a glove.

For instance ideally we would like in the School Temperaprint to employ watercolour paper, with its beautiful textural surface. However this material has a number of defects that do not favour its use with our process. It needs to be very heavily sized to work efficiently. This heavy sizing destroys the very surface texture that is its main attraction.

The problem lies with the absorbent nature of the material. This is a required characteristic for watercolour paper as easy staining is part and

parcel of the watercolour painting technique.

However the unexposed soluble egg emulsion has to be removed in our process which is part and parcel of the processing cycle. The egg emulsion is far to adhesive to be used in this manner on unsized watercolour paper. The soluble non-image would just not come out of the paper fibre, resulting in massive pigment stain.
Secondly the watercolour paper is inherently unstable from a dimensional point of view.
It stretches and shrinks during the processing cycle. Even when dry it will still change it shape in response to relative humidity and temperature change a characteristic that makes fine registration difficult to achieve.
As the process is by its very nature a multiple coat method of printmaking. The final image is constructed of a number of tonal and/or colour coatings, each in exact register; it is difficult, if not impossible, to achieve this aim, with normal untreated watercolour paper.

We have tried many differing substrates and found that with suitable
Sizing or preparation, most, can be made to work with the egg emulsion. These considerations are further discussed in the advanced section of the book.

Ideal Base

We have found that an impervious base seems to work best. It facilitates a stain free surface, and allows for an accurate system of registration. Thus in one stroke solving the problems, inherent in other processes.
We mainly use a polypropylene plastic paper known as Synteape
In the UK and in the States the product is called Kimdura.

However it is manufactured by the Oji-Yuka Synthetic Paper of Japan and is called Yupo and can be sourced through: --
http://www.yupo.com/welcome.html
Please find further information in the appendix section

Alternative substrates

This does not mean that there are no alternatives to this excellent product. Semi-matt RC photopaper can also be employed if the sliver gelatine emulsion is physically removed with strong domestic bleach. Standard watercolour paper works if it is strongly sized. We have found that a 10% to 12% solution of gelatine to be effective. Or two neat coats of Liquatex matte medium. This changes the quality of the watercolour paper surface to a pleasant sheen.

Other substrates such as wood, stone, metal, fabric and ceramics will be dealt with in the advanced section of the book. The virtue of this process is the ease with which it will happily coat onto a great variety of substrate surfaces.

The Environment

Tools Materials
Safelighting 100 watt filament (household bulb)
Clean working area
Glass sheets twice the size of the piece of paper.
Piece of Synteape/Kimdura/Yupo larger than the print size
Masking Tape
Paint tray 8-x 4 inch
Foam Roller 4inch
Coloured Temperaprint Emulsion
Paint brush 1/2inch
Kitchen Paper towel
Hairdryer

The Temperaprint emulsion is a light sensitive compound and as such needs to be worked in a safe light situation, such as any other photographic emulsion, but it is nowhere near as sensitive as regular photographic materials, so the normal darkroom requirement does not apply. Sun and daylight must be completely excluded. You should work by the light of an ordinary filament light bulb not stronger than 100 watt at a reasonable distance and keep any fluorescent tubes turned off. You will need to see what you are doing so don't handicap yourself by being too mean with the light, but don't be unaware of it either. The mixture is light sensitive.
The working environment must be clean and as free of clutter and dust free as is practically possible. It is essential that the work surfaces are kept squeaky clean from commencement to conclusion of the printmaking. The Temperaprint emulsion will readily pick up any dust, hair, or other debris in its close proximity.

Coating the Emulsion
Take a sheet of glass; place onto a clean work surface. Attach a piece of Yupo/substrate to this glass, with masking tape applied to the diagonal corners. Ideally the sheet of glass should be at least twice the size of the piece of paper. You should ensure that your paper has a sufficient border around the actual print area to allow plenty of room for you to stay on the paper during the roll coating. This is good practice as it means that you are keeping the coating environment clean because all unwanted emulsion will be on the paper surface, not on the glass, and therefore will conveniently wash away during the print development stage.
Take a four-inch acrylic foam paint roller, and a small paint tray, the sort that you can buy for using with gloss paint. This tray holds a convenient amount of the emulsion, as a minimum say 25ml which will be enough to lay up to 5 coats, and also provides a ribbed palette which can be employed to contain and control the foam roller. Pour a working amount of Temperaprint emulsion into this tray. Stir the emulsion with a small brush to ensure that it is completely smooth and homogenous. Place the roller in the tray, charge up until the roller has absorbed a "generous" amount of the mix, then roll out vigorously onto the ribbed palette followed by clean newsprint until it reaches a conditioned state, neither too wet nor too dry just damp.

A convenient way to control the amount of the mixture in the roller for subsequent coating is to paint the mixture on to the ribbed part of the paint tray and then reload the roller from there. The mixture will get caught on the ribs of the tray and the amount that is loaded on to the roller can be quite accurately controlled by this method. This way you get to know to how much of the mixture you need to replenish the roller to keep it in the ideal coating condition.
When you begin to coat using the roller, roll in one direction only, not backwards and forwards. Roll from east to west, then when you reach the west, lift up the roller and start from the east again. Repeat over and over again; roll north to south, east to west, change direction from time to time. This action will seem a bit strange at first but you will soon get the knack and it is key to getting an even coat.
Try to keep your coating to a defined area, and not just all over the place, Work to an area larger than the desired print size but inside the paper dimensions. Throughout the coating, roll the coat methodically so that all parts of the area get equal treatment from the roller, not just the middle.

Start to roll down hard onto the substrate then slowly lighten the pressure until you are only just supporting the handle. When you begin to coat you should be firm and apply as much pressure as needed to gain the initial evenness and define your coating area. By the time you are coming to the end of the coating procedure. The only pressure should be the weight of the roller handle resting in your hand. Take your time. Let the coat just relax onto the substrate.
By the time you are coming to the end of the coating the roller should be moving much faster, as if you were just lightly polishing the surface.
Directly the coat looks even, stop rolling. If all has gone well, you will end up with a smooth eggshell like finish that will expose well.

Issues and Problems
Beware of handling the Yupo/substrate too much; wash your hands first so that you do not transfer any grease from your hands to the substrate. If grease does get on to the Yupo/substrate when you come to lay your first coat you will get clearly defined fingerprints and patches where the coat will refuse to take. This can be repaired, by scrubbing the offending spot with the roller until the coating mixture is no longer repelled by the substrate. In the long term this is not really a problem as it rarely persists to the second coat, However it maybe an indication that things could be more tightly controlled.

Sometimes beginners experience problems with their first coat that appears blotchy. This is due to the fineness of the surface and the thinness of the coating and is normal

In this respect the viscosity of the mixture is critical. If it is too wet you get bubbles that will denigrate into big blotches and if the coat is too viscous you get little white specks that also give similar unevenness problems. To solve the former, deplete the roller on a paper kitchen towel or clean news print paper. Then pass the hot hair dryer over the coat a few times to stiffen up the coat, and re-roll. To solve the latter throw away the mix, remake and roll over again. Do not try and let down the mixture by adding fresh emulsion

As part of the process you will get a pronounced texture on the first coat. This is the footprint of the foam roller, which will disappear with subsequent coating. To obtain a texture free coat, first time is very difficult. So multiple coating is essential. However in practice this does not pose a problem, as the coats dry very quickly. The process of building up the image in this manner is very satisfying it puts you in charge. Not the process, this is one of the great joys of Temperaprint.

Another problem associated with rolling technique is when you get bars of lighter density appearing in your coat. These bars can be horizontal or vertical to the direction of the roller. The cause is going outside your defined coating area compounded by not rolling in one direction in the early stages. You are allowing the roller to go off the coating area and onto the uncoated surfaces. This has a direct effect on the roller as these surfaces now take some of the emulsion from the roller, which in turn takes it from the part of the coat you want, i.e. from within the print area. You will notice that the distance between the bars is the same as the circumference of the roller, which is a sure indication that this is the problem.

What upsets and effects the students at the School of Temperaprint are minor imperfections in the preliminary coats coursed by, dust, bits of hair, and other debris. One of the major causes that has contributed to this problem has been what the students are themselves wearing, where fibres from their own clothing can get on to the coating surface. Awareness of this problem and a clean working environment will certainly substantially alleviate, if not completely eliminate these problems.

However it must be born in mind that the process is self-healing. As the multiple coating proceeds, students find that these defects magically disappear as the further coats heal the perceived defect until it is no longer noticeable in the print. That perceived defect just seems so much more important when it is the only mark on the paper, in the first coat!

Drying

Once you have finished laying the coat you will need to dry it prior to exposure. To do this, apply a stream of warm air over the surface at the finish of the coating process. This is most conveniently achieved using a hair dryer. When you come to this part do not hold the hair dryer over a single spot, keep it moving. If heat is applied to a single spot you run the risk of heat fogging which needless to say is something that could ruin a print. Keep the hair dryer moving at all times and at least nine inches away.

The Yupo/substrate has no fibre to hold moisture so that the only moisture present is in the actual thin emulsion layer that you have applied. It will only take a few moments, at most a minute, for this coat to dry. You can tell when dry by the surface sheen, which turns to an eggshell matt appearance. To test if the coat is actually dry, turn the hair dryer on to your free hand to drive off any moisture and then lightly run your hand round the boarders of your print. That way if it is still tacky you have not disturbed the main part of the coat that you want to keep. Once the coat is dry you are ready to make the exposure. Remember the coating

is much more light sensitive when dry. It is a good idea to have a separate clean workspace dedicated for this purpose. Remember DON'T OVERDRY. Otherwise a heat fogging will spoil the print.

Exposure

Contact printmaking

NEED

As previously stated, Temperaprint is by its nature very insensitive to light. Herein lies both the strength and weakness of the process.
Contact printing is the only feasible method. Although there are heroes who spend hours printing by projection in our opinion, life is just to short to travel down that path. However they're many advantages to contact printing .The method is mechanically faster than most the projection technique. It is possible to print several negatives at the same time, and contact exposure once assessed, will tend to remain constant.

The main disadvantage is that to make a reasonable sized print, a negative of the same size is also needed, and as most of contemporary photographic image making is centred around small format negatives. Some form of enlarged duplication will needed

LARGE FORMAT

The prime requisite will be a large format negative that is the same size as the resultant print. This aim can be achieved in a number of ways, as the Chinese say there are many paths to heaven not just one.
We at the School of Temperaprint now concentrate on the production of positive digital files that we then enhance electronically, and output as printers in either negative or positive separations via the computer and print onto inkjet film. There is a whole chapter devoted to the production of these printers later on in the book.

Alternative non-digital methods are also possible and are described in the technical appendix, for those not conversant with or sympathetic too digital imaging and control.
.
CONTACT PRINT MAKING

Registration

Need

At the heart of any multiple printing lies the problem of registration Temperaprint is no different, fortunately our yupo/substrate is dimensionally stable so half the problem is solved.

Methods

There are many methods of registration that are used in printmaking and industry. The most common and reliable is the pin register system. This is a method where the printers are punched with a series of holes that are in the same place on each of the printers. The paper that you are going to print onto is also punched and the printers are attached using special pins that fit the holes perfectly. The joy of this is that the pins will ensure that the printers always go back in exactly the same place each time with out the need to visually line them up, as all the registration is carried out in the initial punching phase.
The problem with this is that these systems are professional and can be prohibitively expensive. An inexpensive version of this system can be constructed using a four-hole office punch that is a fraction of the cost of the professional versions. Unfortunately these punches are not standard in the size of the hole that they produce and there are no pins on the market to cater for them. A way that has been found to deal with this problem is to use double-sided tape and stick two or three layers of Yupo/substrate together with a further strip of the double-sided tape on one side. These pieces of layered yupo/substrate are then punched to produce round punched pieces, these punched round pieces are then attached to a further slightly larger piece, say about three-quarters of an inch or two centimetres in diameter. This can produce a cheap and relatively easy way of solving the problem Though not completely perfect you can make many of these home made pins, so that if they fail, as some will, it will not matter as you will have many more as spares. A bonus if you have a problem with miss-laying things in a working studio. Some stick on rubber or plastic tiles can also be used in a similar manner.

Contact Frames
For a contact frame there are many that are supplied from photographic manufactures that are perfect for the job. The best type of contact frame is a vacuum frame where the air is removed using a pump. This results in an even contact across the whole print area and ensures that all the detail that is in the printer has a chance to be exposed accurately. Again the problem is that this is a professional piece of equipment an as such commands a professional price.
A simple and easy type of frame to make consists of at least four strong clips, a sheet of glass, and a piece of board cut to the same size as the glass and some thin foam. Make a sandwich of the board, foam, yupo/substrate printer and place the glass on top. Now put the clips around the edges and they should squeeze the glass and the board together, thereby giving you the contact you need. This is a very rudimentary way of achieving a form of contact frame.
A more precise method is to construct a pneumatic version known as the litestar frame as explained in the advanced chapters

Ultra Violet light Sources
Now that you have your coated paper and printer prepared, it is time to expose it

to a light source rich in ultra Violet radiation. A number of light sources are employable, but most are too weak for this process. A cheap and convenient source is a sun bed, particularly the small facial or half size torso type that can be purchased at quite reasonable prices.
It is important to remember that ultra Violet light is a harmful form of radiation and as such should be contained even if it is a sun bed which has been designed for tanning skin. The other source of useful light, which is readily available, is direct sunlight. This can be used, but you will have to deal with the vagaries of the weather and the time of day. A further source is a plate maker or silk screen lamp such as is used in industry. These sources can be very dangerous and you should always confer with the suppliers on its containment and use.
Of all the sources the simplest and most convenient is the sunbed. You should be able to purchase this through mail order, or if you are living in the more northerly climates you may find one in a local store or second hand shop. The good thing about sunbeds is that they are consistent, repeatable and can be used with the flick of a switch; a major consideration in a multi-coat system such as Temperaprint.
To use a sunbed place it face down on supports at each end leaving a gap underneath for the contact frame to be slid in and out. You can place a piece of fabric along the edge of the gap to contain the light but do not cover any heat vents. Exposure should be made at a distance of three to six inches. If the coating has been carried out correctly. The time exposure should be in the order of three to five minutes; you will need to test this for yourself. Which is only a case of making a series of controlled test exposures to find an optimum time. Darker colours may require a slight increase in exposure while thinner lighter coats may require slightly less. Familiarisation with the process will come after making many coatings, and you will in time be able to see how to make these slight adjustments instinctively.

Wash off Environment
Tools
Sink with running water
Paint pad
Washing-up liquid
Sponge
Small brush
Two photographic flat bottomed dishes, one with a cover
1% sulphuric acid
Glass sheet
Plastic or rubber apron
Protective gloves
Tongs
Eye shields

Ensure that the washing off area has everything in place. There should be running water, preferably with a hose so that you can direct the water where you want it. Place in or next to the wash area a bowl with water, containing a "squirt" of washing-up liquid, in which you can place the paint pad, brushes and sponge. The glass sheet is to lay the print on during the development of the coat. It is

important that the surface you use for the wash off is flat and not uneven because when you remove the unwanted portions of the coat, any irregularities in that surface will result in uneven development. Depending on your own individual circumstances and preferences you may find it more comfortable to work in an upright position in which case ensure that the glass sheet is propped up at a suitable angle inside the wash area and is not liable to slip. You may find that you prefer to work flat and have the room to lay the sheet down in the wash area. The choice is not a critical one but should be made according to comfort and ease. This is a multi-coat system and you will return to this area time and time again.

There will need to be a provision for the 1% sulphuric acid clearing bath. This bath at the specified dilution is not dangerous. However it is sensible to place in a position, that easily disposed of when finished with. Ideally this should be either in the washing area so that splashes and drips are contained and easily washed away, or directly adjacent to it so as there is minimal handling of it in when in use. The function of this bath is to remove the residual dichromate stain, which if not removed, will degrade the colours of the print giving them a orange brown cast, in monochrome this is of no matter, but in fine colour work it is essential to remove this troublesome caste.

Developing the Coat

Now that you have prepared the area and completed the exposure the next phase is to remove those parts of the image that have received no exposure. After you have removed the print from the exposure unit and taken off the printer, place the print in a tray of water to remove the now unwanted sensitizer. This soaking phase will still need to be carried out under subdued lighting. You will notice that the water turns yellow.

This is the Ammonium Dichromate being released from the coating and dissolving into the water. The importance of this is that the coating layer will no longer be sensitive to light. This means that once it has had a one minute soak you can take the print out into a full light situation to complete the washing phase of the print without any danger to the print

Place the print on the glass sheet and wash with running water to remove any sensitizer that remains. Take the paint pad and place it flat to the surface of the print and in a gentile circular motion begin to remove those portions that are still soluble. As you are doing this, do not press, let the pad glide over the surface of the print by is own weight do not press down In this way the pad is very gentile and will produce an even development if done uniformly.

Work across the whole image area in a methodical manner so that all areas get equal treatment. From time to time play the water across the surface so that you can see any area's that have been missed and are not there for being fully developed. Wash some areas a little less if you want to retain more of the coat or a little harder if you wish to retain less. Be careful not to lift the pad on to an edge or corner, this will result in a more abrasive effect on the coat and will produce an uneven development.

A brush can be used creatively to remove coating in precise area's if required. . It will be more abrasive than the pad. Having the benefit that you can tackle individual elements of the image in greater detail giving a more painterly approach to the manipulation of the image than just using the pad alone.

A sponge can also be used to remove the coating gently instead of the pad. Being able to tackle more specific areas. Though not as precise as the use of the brush it does allow you to scumble the coat in a similar manner as painters treat a glaze coat, also the application of a small amount of cream abrasive can be effective. However do not use hash powder type such as Vim. What is needed is a gentle cream abrasive the type that is used to clean plastic baths. With these abrasives it is possible to obtain very subtle graduations of colour and tone.

Clearing Bath

The clearing bath is used to remove the residual dichromate stain that is left after the print has been developed. The bath consists of a dilute solution of Sulphuric acid i.e. 1% great care must be taken when this is initially made up further information will be supplied in the health and safety section later in this book.

Once you have completed the wash off phase to your satisfaction place the print into the bath. A yellow tint will become apparent within the bath; this is the residual stain being removed. The clearing will only take about a minuet to complete. This stage does not need to be carried out after every coat and can be either left to the end of the printing, or done at any chosen point when you wish to check for colour balance.
With monochromatic images using just earth colours you may omit this stage if you wish, as the stain is a compatible colour so the clearing will predominantly have a lightening, rather than a chromatic, effect.
Once the print has cleared remove it from the bath and wash.

Final wash
Once cleared the print needs a final wash to get rid of any residual clearing bath that may interfere with further printmaking.

Dry
Now dry the print keeping the hair-dryer moving at all times, or just hang it up to dry.
The Synteape/Kimdura/Yupo has no paper fibre so it will dry quite quickly. You may blot the surface to remove the bulk of the water using J cloths or other similar non-fibrous material but be careful the surface emulsion is quite delicate until it has fully dried.

Conclusion
When you have reached this point you are ready to re-coat the print. Further colour layers will increase the richness of the print but you must be aware that if you continue to coat beyond a certain point, the print will begin to darken. Artist colours, in common with all paints work by the subtraction of light, so further coats will have the effect of taking more of the reflected light away. Again this is a matter of experience and cannot be prescribed in advance.
You are now ready to return to the coating stage. The coat that you have printed is now quite firmly attached to the substrate and will not be removed by further coating.

Happy printmaking Alex & Pete

http://www.books.i12.com/parlour/index.html