

# **Start Your Own Business**

# **Screen Printing**

# **Course**

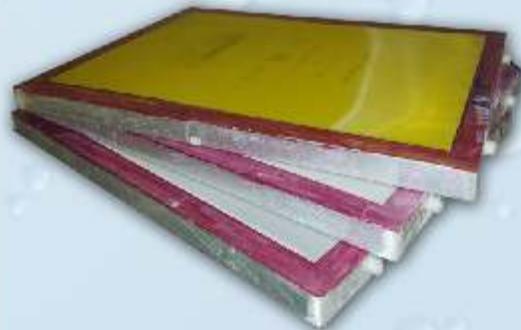
## **For Beginners**

**First Edition**



**STEP-BY-STEP  
ILLUSTRATED INSTRUCTION**

**All You Need To Know In One Easy-To-Follow E-Book**



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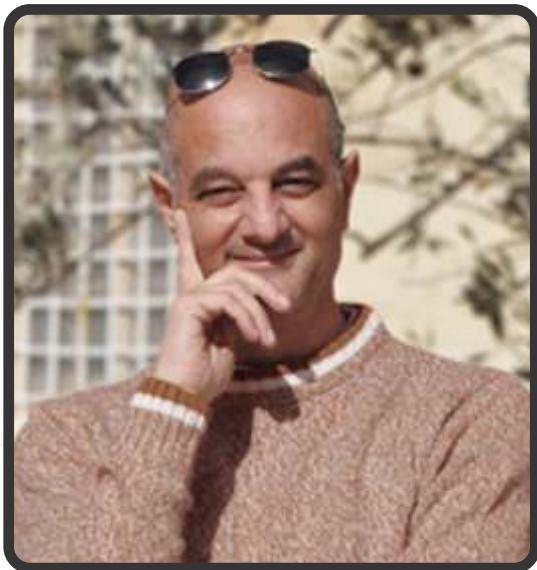
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Hello and thank you for purchasing this Screen Printing Course E-Book.



I am Patrick Borg and I hail from the small and beautiful Mediterranean island of Malta .

That may not sound any bell with you but what I'm offering surely would!

10 years before I was born, my father started his long way into screen printing in 1952, with a hard bound copy of a book, teaching screen printing. It was something new to him, and he had to study this book to acquire the technique, and practice all that it said in the instructions, step by step. This has inspired me to write this E-Book course.

He was thrilled by the fact that what he had discovered was really coming to life, by the end results of the printing process. He kept perfecting the printing process and also to deepen his information and experience in screen printing.

I was born in 1962, 10 years after my father started screen printing in Malta, no one new about this process of printing, so by the age of 10 years, I was already assisting my father and already designing fonts and numbers to get the know-how required. By time it became a part of me, and I wanted to deepen and get more experience in this printing process, screen printing. Like my father, I continued to improve and to progress in achieving better quality prints and also ventured in multicolour. I was producing design work and screens. At that time, there were no specialized chemicals and inks as today.

With all my gained experience I thought of sharing this with you, when presenting this E-Book course. I will outline all aspects of the printing process, from the very beginning to the end, where you will achieve your first prints. I would like to thank you for obtaining this copy of the screen printing course, and I suggest that you will read it to the end, as all the way through there is valuable material and information about the process which will guide you to start your own printing business and start making money.

## What is screen printing and what does it consist of

Screen printing is a printing process that has been used for hundreds of years, by means of which this process you can print on any surface and material.

Screen printing is very comprehensive in the sense that since you can print on as many surfaces and materials as you like, this will put you in a challenging position. Screen printing is a very technical process and requires great experience, but don't worry, here comes help!

For your ease of mind, it is to be noted that I have been In screen printing for the last 40 years and consequently I can teach you screen printing in such a way that you will learn a quick procedure how to exploit this process and thus you will have your business up and running within a few days, by producing professional results, with durable printing that your customers will be amazingly satisfied. Screen printing, although at face value seems to be very easy, must not be taken for-granted that one will start printing unless first, good basic understanding of screen printing is achieved about what is required to start the process.

So noting this, let's get started!

## What do we need to start :

To embark we will need to procure and get our provisions on board. Essential articles needed are the following:

- Mesh,
- Frame,
- Photographic Emulsion,
- Film Positives,
- Coating Trough,
- Ultra-Violet Exposure Unit,
- Squeegee and
- Specific Ink. (Depending what you're printing)

Ok, so let's explain what these things are:

Frame - A frame made out of special wood that has anti-warping properties or better still if we use aluminum frames. (Water does not effect the frame)

Mesh - Then we would also need what is called a "mesh". Mesh is a material, which is nowadays made from polyester thin fibers, systematically weaved to produce a very strong material. It comes in different colours and grades. These all have different properties that have to be used according to what we will be printing, and on which surface. We will get into more details later on in this e-book course.

Frames - It is important to note that initially wooden frames are better, in a way that one can stretch and staple (using an industrial stapler) the mesh from which the ink will flow through in a controlled manner.

Photographic Emulsion - This is a sort of low viscosity paste which, when exposed to UV light, will harden to produce a "blocking" pattern or trim in the mesh, so the ink can flow through those parts which are "open", due to the non-hardened parts on the mesh. Hardened parts of the mesh will develop through the process of "engraving" or "exposing" the coated screen in Ultra Violet light, which comes from the exposure unit.

Coating Trough – Did I mention “coated screen”? Yes, coated screen is the frame with mesh, called “screen” so in order to coat the screen, you will need a “coating trough”. This is a piece of aluminum channel, which has a kind of hollow centre like a reservoir or space where to put the emulsion, and so with this, we could “coat” the screen, systematically, from both sides. We will also be explaining and elaborating on this, later on in this course.



We already mentioned the mesh being stretched over the frame. Just a note that I have to mention here, is the fact, that when it comes to aluminum frames, you cannot “staple” the mesh to the frame for obvious reasons. So the mesh has to be “glued” with specially formulated glue or as it is technically known, Mesh Adhesive. We will get to this again later.

So to start, you have to produce the frame with the stretched mesh to it.

Once you have this, then there is a process that is called “screen coating”, followed by “screen engraving” or “screen exposure” that means that you will have to produce an engraved image (by means of a positive film) onto the mesh, photographically, so that then, you can start the printing process, by using a specific ink. So to summarize what we discussed until now here is the order:

Producing a SCREEN (attaching mesh to a frame)

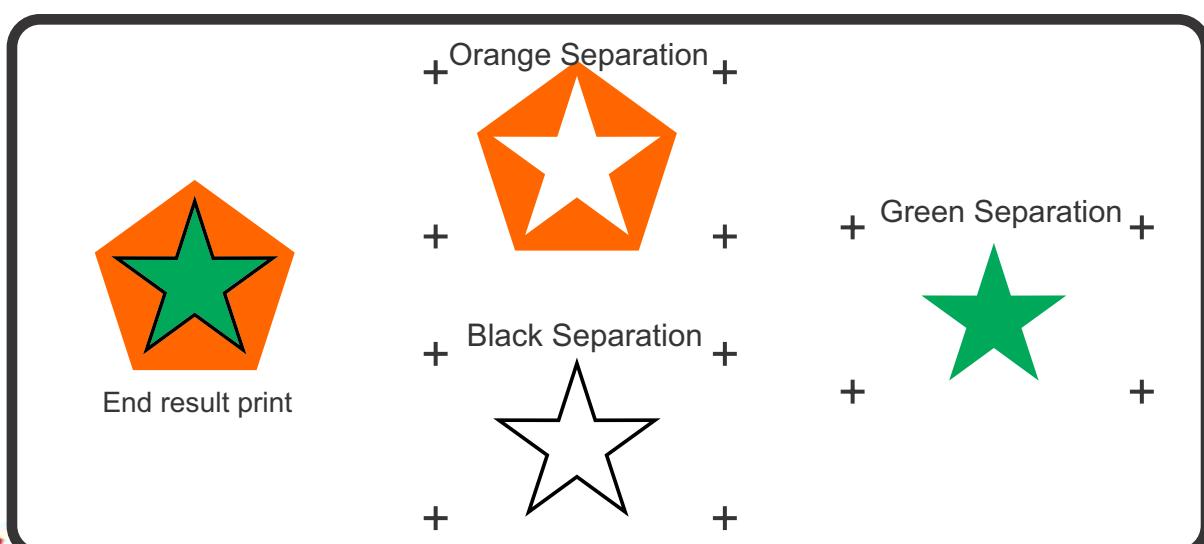
COATING the screen, with EMULSION from both sides, using a COATING TROUGH, in a systematic manner.

## How is the “Positive” produced ?

Ok, so now that we have arrived at this step in the process, I will explain how this procedure is done.

Way back in years, to produce a positive we had to go to an imaging bureau in order to produce a black image on a transparency (plastic like) polyester film. So the positive is a carrier transparent film, on which an image in SOLID BLACK is printed out. Nowadays, we can use a normal inkjet printer to produce such film positives. The image in turn, is produced by computer graphics. So let me tell you how this works :

Let's say you have a customer who wants a 2 coloured logo to be printed on t-shirts. First, you will view the logo to determine how the colours are spread in the graphic, and then you have to produce that on your computer, using graphics programmes, such as: CorelDraw / Adobe Illustrator and Photoshop. (Any help in this regard will be gladly extended on request). Once you produce the artwork on computer, preferably using CorelDraw or Adobe Illustrator, as it is a “VECTOR BASED PROGRAMME” so the edges are sharp (not pixelled as in Photoshop as that is a “RASTER BASED PROGRAMME, which we will need as well, but for photographic images or multi-coloured images) then we will need to have EACH COLOUR of the logo to be printed SEPARATELY onto the ink-jet transparent film in black. Thus you will have the logo printed onto 2 separations, so that when placed one on top of the other, this would constitute the whole logo. In this case, there are 2 separations, because the logo is in 2 colours. If it were a 6 colour logo, then you would need 6 separations. One for each colour thus, one screen for each positive.



## What follows next – Coating the screen

So we now know how to produce a SCREEN. We also learned how to produce a POSITIVE. Now we need to know how to COAT the screen with photographic emulsion, in order to produce an EXPOSED SCREEN.

So we now come to Coating :

Coating, although rather simple, is at the same time very challenging. Why? Because, once you fill the coating trough with emulsion, you will have to put it and press it slightly onto the lower side of the screen and with some consistent pressure and speed you will move the trough from edge to edge (vertically) onto the screen. This you will do on each side of the screen and then dry it by means of "warm air" possibly by means of a heating fan. It goes without saying that where you dry the screen, is immaculately clean. Dust is the "enemy" of these fresh coated screens.

Coating is also applied in different techniques, especially when the "grade" of the mesh is coarser. The coarser the mesh, the more ink can flow through. The finer the mesh, the less ink flows through. So in retrospect, we have, a screen with the mesh stretched on one side. So, if you put it flat on a table, the stretched side is on the table side and the "frame" is facing you.

That is called the inside of the screen, while the side with the mesh on the table side is called the outside of the screen. There are technical words for these which are "Printing side" and "Stock side", but don't get confused with words and let's keep it, inside and outside of the screen throughout this course.

Note :

Photo Emulsions have different categories, to serve different purposes. For example, if you are printing "plastic stickers", the emulsion to use when coating the screen, must be compatible with the INK you will be using to print "plastic stickers". So, since the plastic stickers are printed with "solvent based" ink, you should use "solvent resistant emulsion".

Having said this, certain emulsion manufacturers, produce either "water resistant emulsions" – "solvent resistant emulsions" and DUAL RESISTANT EMULSIONS or better-known "ALL PURPOSE" emulsions. I must mention here that there are water-based inks, solvent-based inks and oil-based inks. We will be finding more

detailed information in the “inks section” later. But let.s return to Coating.

You must always clean the mesh with solvent before applying Emulsion: It is good practice to clean with solvent first and then apply what is called a screen de-greaser, so as to clean the mesh from unwanted finger prints and “oil residue” from the mesh weaving when manufactured.

So one of the best ways to coating a screen is, for example when printing plastic self-adhesive stickers, using a 120T – 140T mesh (grade) is to coat it, 2 times from the outside then turn the screen and coat it “once” from the inside and then dry it in a flat position with the “inside of the screen” facing you.

If you are printing t-shirts for example, you coat, 2 from the outside and 2 from the inside. You can also coat using the first technique, 2 outside+1 inside. Always after coating, dry the screen with warm air (not hot) in flat position, inside facing you. Always remember to put some spacers under the screen, so as not to have the mesh touching the surface of the table where you are drying the screen.

### **Can I use the same screen for other jobs ?**

Yes sure!

How?

After you finish an order, (make sure that all is in place and the quantity requested by your customer is all there) you can “DISSOLVE” the coated emulsion, then dry it, clean it and re-coat again for another operation. So this way, it will not be expensive for you to invest in some screens with different mesh grades for different jobs. You can always “RE-CLAIM” the coating and start a new project over and over again. Nowadays, you can buy “READY-STRECHED” screens so you could immediately start coating and printing fast. (For more information contact me and I will assist you in everything you need, including information, where to buy, what to buy and how to buy) I can, at separate cost, also produce your artworks and whatever you require at very competitive prices. (Special and discounted prices for patrons of this course)

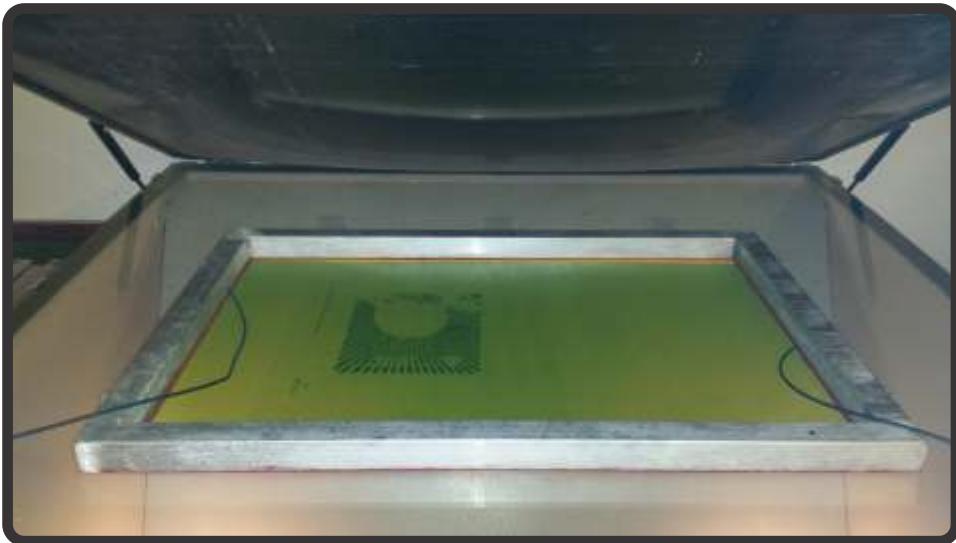
### **Mesh**

The mesh plays an important role in achieving high quality printing besides other advantages. In order to achieve a thick layer of printing, you must use a coarse mesh. So how do we

know which mesh to choose? That is a very good question. Well, mesh comes in different “grade sizes” so to say, like fine mesh measure is 120T / 140T/180T and so on. Coarse mesh would be like 15T/29T/34T and so on.

## Engraving / Exposing your screen after coating

So up to now, we learned how to produce a screen, clean it, coat it with photo emulsion and dry it to prepare it for exposing the image through which printing can be done. To engrave or expose the coated screen you will need an EXPOSURE UNIT. An exposure unit consists of a box with UV light in it and on top a thick glass so we will stick the positive to the screen (on the outer side) and then we will put it on the glass and, depending on the model of exposure unit you buy, it can have an elastic blanket and vacuum unit so as to keep the screen in constant contact with the glass until the exposure time is over. You can contact me for further details on which model you can buy and from where. This will depend on the budget you're willing to invest. Basically, from the pictures in this e-book course you can see the type to what I'm referring.



After exposure time is over, switch off the unit and then you can peel off the positive from the outside of the screen, (put It in a secure place so you can use it next time the customer returns to re-order the same job.) and then, you can wash it with water, to rinse out the un-exposed area (where there was black from the positive) so when it is completely rinsed out and you see the mesh is open, you can wipe excess water and dry it again, inside screen facing you, in warm air until completely dry to the touch.



## NOTE

Exposure time is determined according to which emulsion you use, because different companies produce different emulsions with different raw materials, so some emulsions are “fast exposing” and others are not so fast to fully expose and harden. Exposure time is also determined from how thick the coating is on the screen. Since earlier In this course I mentioned that the mesh counts differ from one another in the sense that we will have to determine mesh count according to what we are going to print, this will determine how thick the coating and in turn, this will determine how long should the exposure time be.

By time, you will get experienced enough to learn about exposure time, which also is determined by the distance from the lamps to the glass` surface and also by the wattage of the light. Industrial exposure units may have 3KW or 5KW or more as power of lamps, which usually are Metal Halide. In our case, since we are just starting out, we wouldn't need to invest in such a big and expensive unit, so most of the time, small units use fluorescent tubes but with UV properties. It is important to setup your work place well so as to know what you have and how you will work on it.. In this, again, I can help you to choose the right equipment according to your budget.

To summarize, exposure time is determined by these factors :

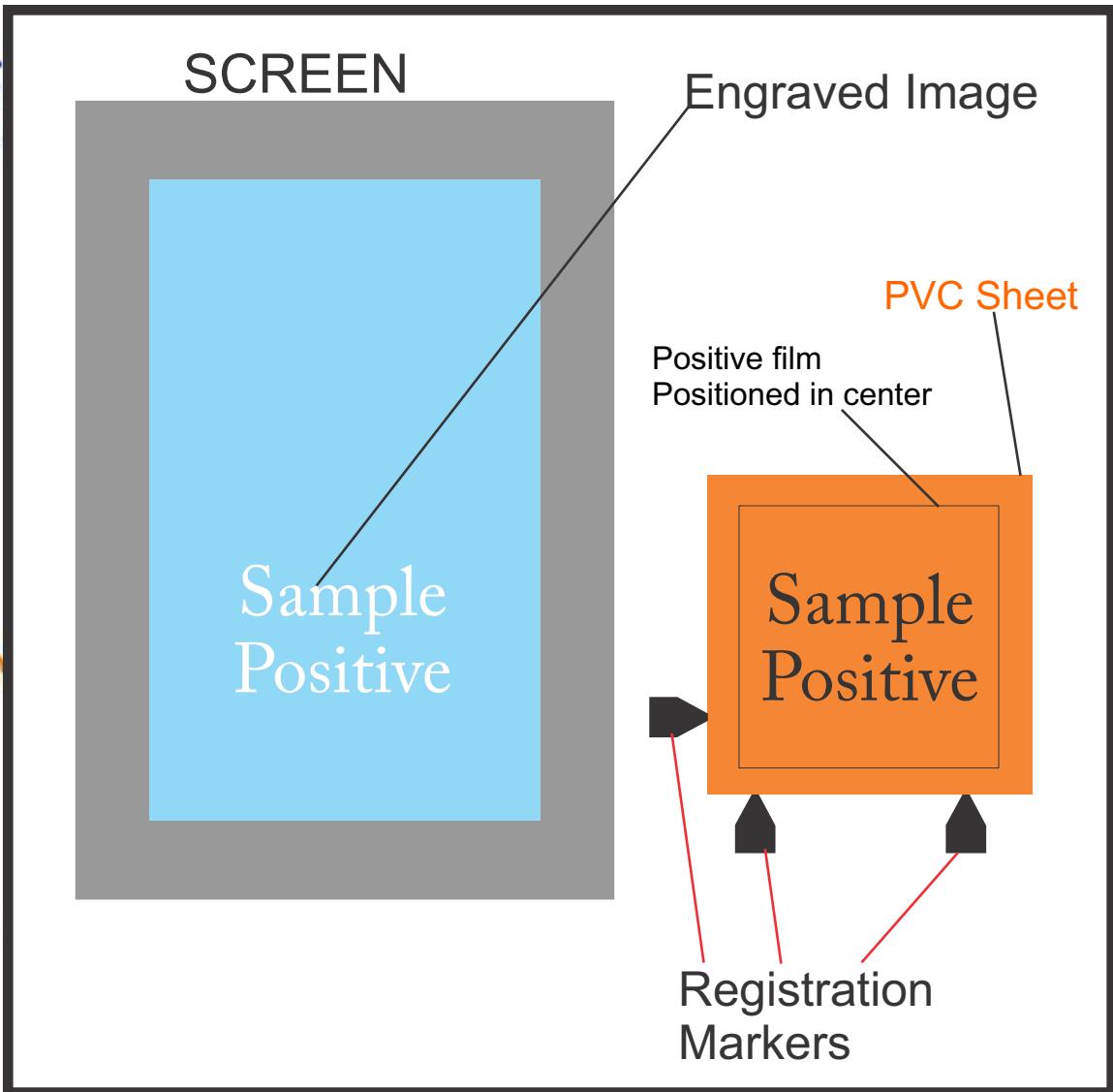
1. Type of emulsion (fast or slow)
2. Mesh count
3. Thickness of coating
4. Type of exposure unit lamps' power
5. Exposure unit`s distance from lamps to glass` surface.

## Setting-up before printing

Once the screen is exposed and well dried, we can start the setup to print the self-adhesive pvc stickers. (setting-up is a standard procedure for what ever you will be printing) In this case for printing stickers, first, we should have a piece of flat wood or bench and with it we'll have two clamps attached to it. (as seen in the picture)



Usually the wood or bench is quite larger than the screen we have available. We will then position the whole artwork in the centre of one of the pvc self-adhesive sheets so that then we could position the first colour positive in place of that particular colour in the artwork. This way, when we have the positive taped to the pvc sheet, we can proceed to stick it to the base of the bench or wood, where the screen is clamped, and then place the screen exactly over the positive. When you have it in the exact place (you can see this through the mesh and the white opening of the mesh and the black print on the positive) over the positive, on the black image, you will need to "TIGHTEN" the clamps down to keep the screen in place. Before you take off the pvc sheet, make sure, you put some flat small plastic pieces to guide the sheet every time in the same place. These marker pieces can be placed 1 on the left and 2 on the lower side As is shown in the diagram next page.



#### **NOTE :**

PVC self-adhesive sheets (usually these are cut or trimmed to a specific size so all will be exactly the same size, as this will be a determining factor to have the colours well placed on top of each other when printing multicolour). This is called “colour registration”.

#### **Printing stickers**

Now that we have everything in place, and the screen is clamped exactly and firmly on the positive attached to the pvc sheet and the registration markers are attached to the bench or wood base, then, and only then, we could take away the pvc sheet with the positive still attached or taped to it.

**NOTE :**

(do not remove the positive from the pvc sheet, as you must put it in the same place where you now have the registration markers, so then you could setup for the second colour and so on if you have more than two colours). So when you take off the pvc sheet, you can now get the pile of pvc blank sheets that we want to print to be right beside us to be handy while printing. You can use just a little “spray adhesive” in the pvc sheet area on the bench or wood base, so when you place the pvc sheets to be printed in the exact place within the registration markers, the sheets will not move while printing but get stuck by the spray adhesive. (spray adhesive will remain sticky but will not stick to the back of the pvc sheets)

**NOTE:**

To print stickers, papers and any other flat materials in larger quantities and in an Industrial environment, we use what we call “vacuum tables” which their purpose is to hold down the material while printing so as not to move. In our case initially, we can hold down these flat materials, using the spray adhesives. Later on we can invest in a vacuum table or as is technically called a “flat bed machine” (available in various sizes and in manual, semi-automatic or full automatic)

So once the spray is dry and sticky (after few seconds) you can place one sheet and slide it along the markers from below and in the direction to the left until you arrive to the left registration marker. Then press the sheet down. Lower the screen, (it would be advisable to put a 3-4mm spacer under the frame) so it will not touch the base, in fact it will be off the sheet by 3-4 mm. When this is done, put the ink on the inside of the screen, just above the print image, get the squeegee, and put it on the screen, tilt the squeegee about 30 degrees approx, and steady applying some consistent pressure with your hands, slide the squeegee all the way from up towards you in a consistent manner, applying same pressure, speed and angle until you cover well the image on the screen. Then when you're done, lift the screen, and with the squeegee, slide back the ink to where you started, this means you will cover the screen with ink, until you take off the printed sheet and put a new one exactly as you started, sliding it along the lower marker right up to the left marker and press the sheet when in place. Lower the screen and repeat.

And voila! You have the 1<sup>st</sup> pvc sheet printed with the 1<sup>st</sup> colour.

### NOTE:

Now in order to facilitate the process, you must prepare a place where you can place the printed sheets to “air dry”, meaning, put them on some racks one near each other (not on top of each other cause they will need to dry first). Repeat this procedure until all sheets are printed to get the whole quantity required by your customer. ( It is always good practice to do some extra sheets to cover for any mistakes or misprints)

When you are ready, collect the ink from the screen and put it in the ink pot and close the ink pot. Get some solvent and wash the screen and utensils until clean. Then get the second screen for the second colour, and repeat the procedure from the beginning, by attaching the second positive on top of the other 1<sup>st</sup> positive, which by now is still attached to the pvc sheet you started with. When you attach the second positive of the second colour, slide the pvc sheet with the positive attached to it, alongside the lower markers right up the left marker and again press the pvc sheet to get stuck to the base. Now as before, put the screen of the second colour in place over the positive in the exact place where the black print is, and when you’re done clamp the screen to fix it firmly in place. Get the printed pvc sheets, gather them in one pile and get them beside you as before. Then, start again as you did with the first colour. Put the spacer under the screen, lower the screen, put the second colour ink, and with the same squeegee movement, repeat the procedure until you get them all done ready and printed. Always clean the screen and utensils when ready.

### Screen Printing on other Surfaces and Materials.

With Screen printing, we can print on anything and to print on anything we have to know which kind of “ink” we should use for the appropriate surface or material. We can print on many kinds of plastics including, PVC, ABS, Polystyrene, Polypropylene and many more. We can also print on wood, steel, aluminum, ceramics, canvas, textiles and others.

Now I'm going through some of these surfaces, so we get the know-how how to print and which ink to use. The use of inks varies from trademark to trademark, so here I will mention just one of these as

this is found worldwide, and is easy to get all information on their website and check about their distributors in your area.

The company is called FUJI SERICOL. This is one of the best companies as an ink manufacturer, both for screen and digital printing.

There are of course other well-known companies who produce inks and chemicals for the screen printing industry. But I cannot mention these here, and I rather give you information on request. So, taking screen printing on canvas for example. You need to use POLYPLAST range of inks. These inks adhere very well to canvas, and they will not be effected with sunlight, as opposed to digital printing systems, which if not UV treated, with a UV Coating lamination will fade if placed outside. Even with this coating, digital printing will fade after approximately five years, while screen printing never fades. Screen printing is stronger and more reliable for weather conditions. Screen printing over digital printing has some disadvantages, in the sense that screen printing is more profitable in quantities, while digital printing is profitable in single and or very low quantities. As for example, printing on t-shirts, in quantities it's more profitable than digital printing. When it comes to printing a few t-shirts then digital printing is more profitable.

So back to printing on canvas; the procedure is the same as when printing on PCV self-adhesive stickers, with the exception that canvas may be "thicker" and not as smooth as the PVC sheets. But regarding the process, it is the same. You can print on it, in one colour, multicolour and even photographs. (This is a very technical procedure, not advisable to go into at this stage)

The size of canvas and also the shape, will determine which procedure to use, in order to achieve multicolour printing on such material. We must also keep in mind, that if we want to print multicolour prints on "dark" material, we must weigh carefully the outcome of the printed image. Colours tend to change when printing on dark surfaces, so we must be careful to choose the right ink opacity with the right viscosity and mesh count, in order to achieve bright non-translucent, faded colours.

For now I'm going to focus on "light-coloured" materials, for the sake of this course. When we will have a good grip on screen printing, then we could start going up in levels, and get more expertise in screen printing. We always need first and foremost, the artwork, then the separated artwork, then the positives and finally the screens for each colour to be printed. The rest will go just like all other printing procedures.

The PVC stickers` printing session explained earlier will also be applied. If you're printing on glass, ceramics or other materials (except that you use different inks). The procedure is always the same. (different technicality may apply ) Different inks are used, but the initial printing procedure is always the same. Whether we are printing on wood or plastic or canvas or textile, the artwork, separated artwork, positives and screens are always required. The artwork plays a major role in achieving high quality prints.

## Screen Printing in Multicolour

When it comes to screen printing multicolour prints, you must know the behavior of the inks on that material. For example, if you print on white t-shirts, you should produce the artwork for that particular "logo or design". Why? Because you will have to determine, about the colours you have in the logo. If they are normal main common colours, you can choose "transparent" inks. If on other hand, the logo has a very particular shade of colour, you may want to opt for "opaque" inks. You can in fact use a combination of both. Transparent inks, especially for textiles, tend to be very soft to the touch while opaque colours tend to be hard to the touch. So you might need to decide what the end result you would like it to have. It might also, be the choice of the customer, that the prints on t-shirts would be soft and not hard. For screen printing on dark material and in multicolour, one may want to opt for a "white base" system of printing. That is, you print a white base that goes underneath the logo to be printed. Then we will print the colours on top, after, the white print has dried to the touch by means of an infra red dryer, technically known as a "flash cure dryer". We use the terminology "flash it" meaning to flash the white (or it could be another colour) This has another procedure on how to do it, especially where the artwork is involved. You must look at the logo with a "detailed eye" because it can be possible that the white base would not be printed under the whole logo, but just under the "key colours". That is why, the artwork is of utmost importance as the first step towards quality prints.

## Artworks

When it comes to artworks, we must choose the right graphic designer. We must choose a graphic designer who knows well screen printing, in order to give you an Artwork that will not pose problems when printing. A screen printing graphic designer, will produce artworks that will print well, with the right procedure. The colour sequence also plays a major role, when preparing an artwork for screen printing. That is why, a graphic designer, must be chosen particularly to know screen printing well. Not just someone who has only an elementary idea of screen printing.

I can vouch for this as, throughout my thorough years long experience as screen printer and graphic designer, I can offer to producing the required artworks for a successful operation. Nowadays, since being produced in digital format, artworks can be sent via email. You would just need to print it on your ink-jet printer to produce the positives.

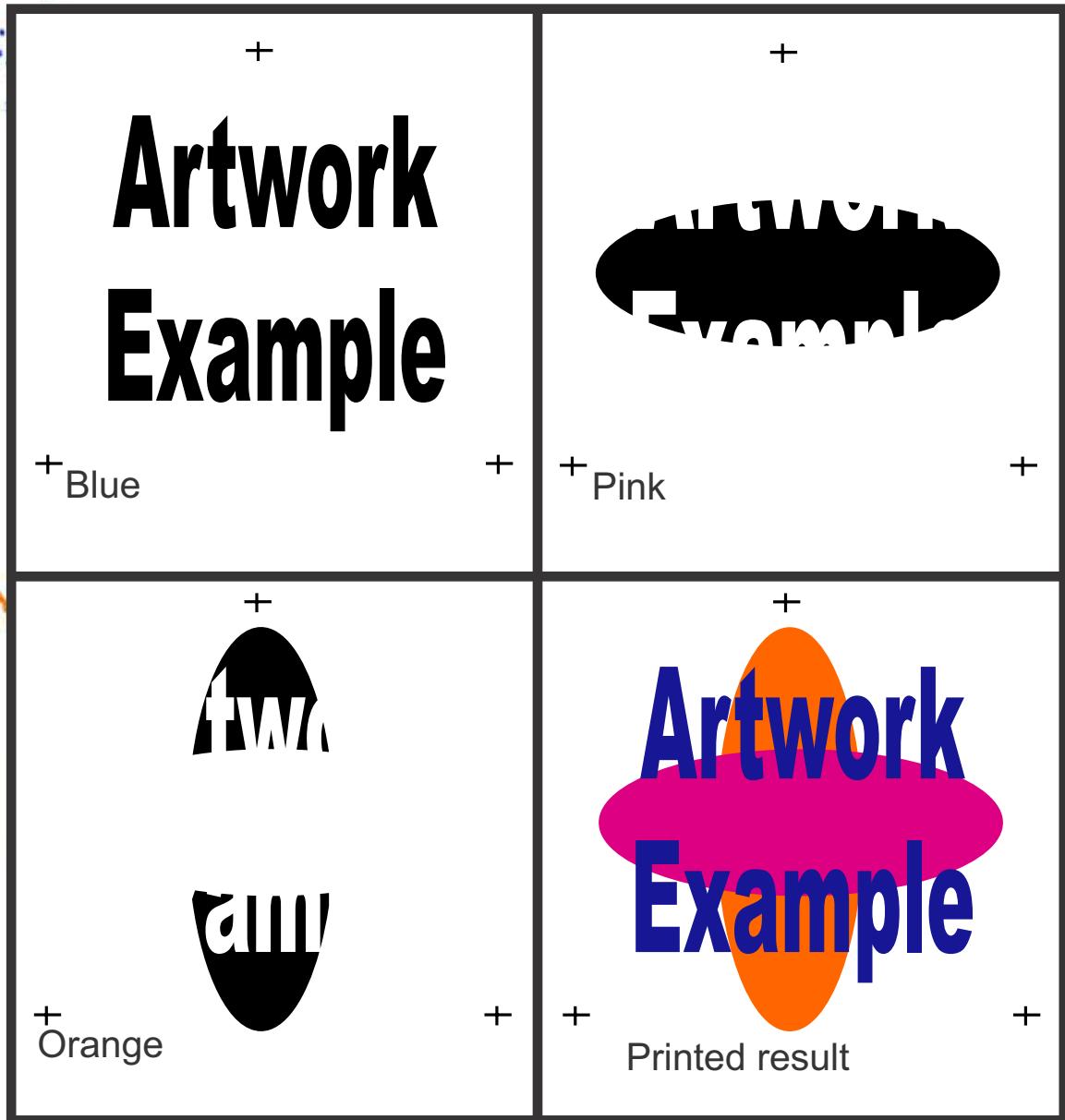
I am offering “special discounted “ prices for customers procuring this e-book course, including full and complete free-of-charge online consultation and advice on technical matters. On-site consultations for management and employees can also be arranged.

## Screen Printing on Textiles and T-shirts

Screen printing on t-shirts and textiles, can be very challenging. T-shirts are mostly multicoloured and not just white. Some are manufactured with DYE colour, and not with coloured thread as sewn T-shirts. This makes a difference when printing. This is not much different from printing on Polyester material, which mostly is used for the sports sector, like track suits and football apparel.. This material although fine to the feel, poses some technical problems when it comes to printing.

## So what comes first?

As always, the artwork How will an artwork look when produced ? In the examples below we can see how the full coloured logo looks and also at the stage when the same logo is colour-separated and ready to output from your inkjet printer for positive production.



As we can observe, around the logo there are the colour registration marks. These serve the purpose for aligning the colours in their exact place, when :

- i) Preparing screens for exposing (engraving)
- ii). Setting up, and
- iii) Printing

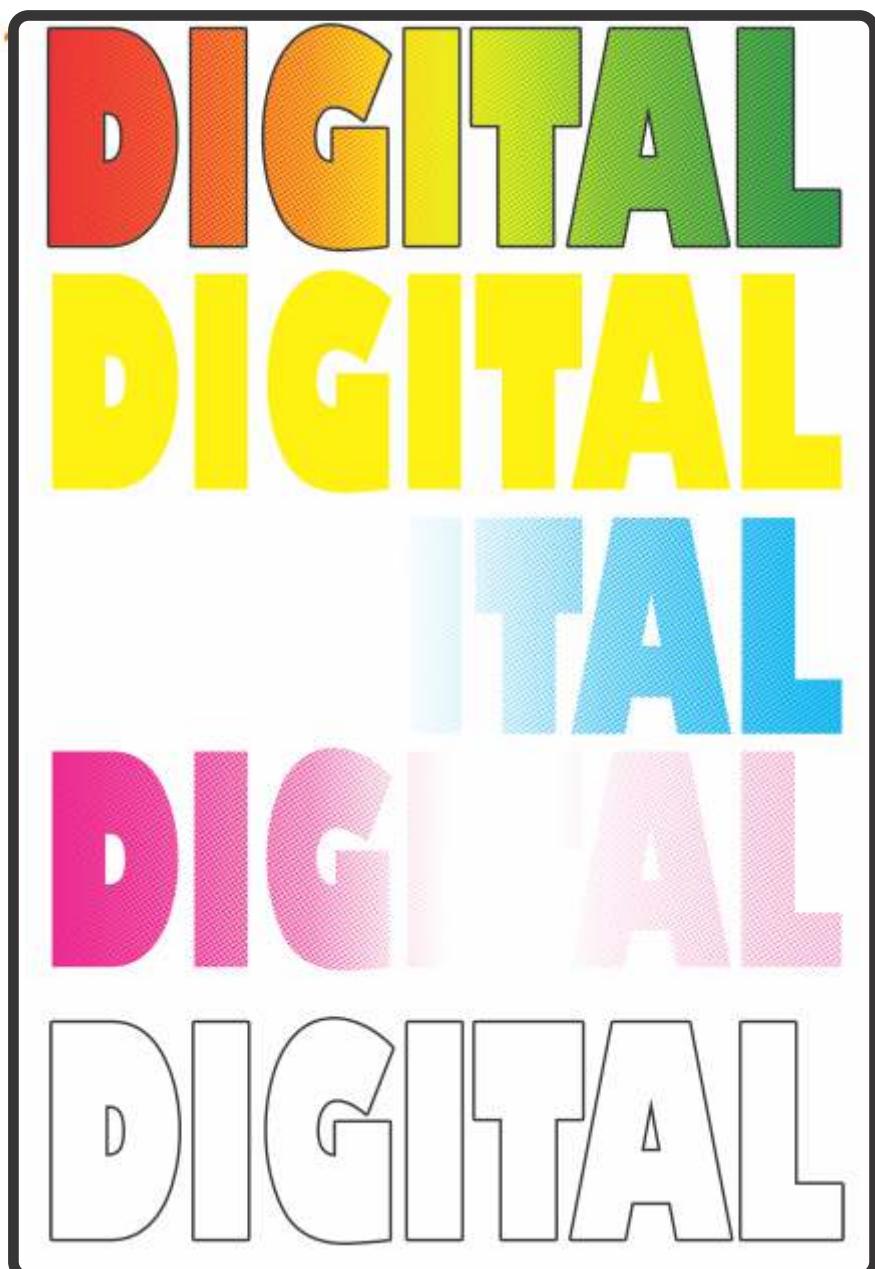
There are also different artwork procedures for logos that are “flat” and there are others that are “graded or photo like” and then, there are others that are “photos” .

Here one may ask, so how could these be produced? Very interesting question!

For flat artworks, it is much of a straight forward process, because

there are “solid” like, solid backgrounds, text and shapes. But when it comes to “graded or photos” the logo is not considered as “solid” anymore. Then we should use what are called “halftones”. Halftones are a series of dots that may be squares, diamond, elipse or round in shape.

They all serve their purpose. Some prefer square dots while others prefer ellipse or even round dots. These serve the purpose of obtaining a graded shade, like from dark to light, as shown in the example hereunder. This, very often, can also include printing a photo, such as a drag-racing car, or someone's photo, or it could be a face of a person or some flowers. In these types of prints there are different procedures on printing them, especially when it comes to t-shirts. Hereunder are some visual examples:



Screen printing on t-shirts is a little bit different from printing on rigid PVC or other similar materials. Why? Because as we well know, the material is “stretchable” or “elastic”. So, T-shirts and textiles need to be fixed in place until “all colours” are printed, then we could take off the T-shirts for drying.

### **Do you notice a difference from printing PCV stickers?**

Of course there is, in what way, you may ask? The PVC stickers can be printed one colour at a time, and they are left to dry in between each colour printed. But in textiles, we cannot do that as the colours will not fit exactly in place and precisely. So how will we do it?

### **Something about textile inks**

The inks that are used nowadays, can be “water-based”, which are transparent in nature, and are mostly good to print onto white T-shirts and textiles. One of the benefits of this type of ink, is that when printed, it has a very soft feel to the touch. Also, you don't need any “heated dryers” as the ink will air-dry and is thereafter washable. These inks are called “Self-polymerizing water-based inks”. There are other water-based inks, which are called “curable inks” which means that we would need a heated dryer, which has a certain chamber length where heat is kept at a certain level, usually 140 – 180 degrees Celsius for about 2 - 3 ½ minutes. This depends on the ink manufacturer's specifications, but mostly it will work through this range. The other types of inks that are “curable” are called “Plastisol inks”. These have plasticizers and react to heat, and thus when they react to heat, they will dry and “cure”, meaning, that the t-shirts could be washed, without the ink running-off. In inferior printing, when this is not done according to standards, most of the time, the prints will wash-off.

### **The pros and cons of Textile Water-based and Plastisol inks.**

There are two types of water-based textile inks:

- (1) . Self-polymerizing, and.
- (2) Curable

The Self-Polymerizing inks don't need any heated dryers, or “curing”, so you need less equipment and the printed results, especially on T-shirts have a very soft feel. Water-based inks are of a transparent nature, and thus you cannot print on dark T-shirts and textiles. On the other hand, water-based inks, tend to dry on the

screen if left for quite a few minutes without printing, and thus this will clog the screen openings. Often, we will have to take everything off to wash the screen by means of a power-washer in order to open the clogged areas. Remember that if the screen is clogged, the ink will not flow through and the result will be that certain areas will not print.

## Curable

The water-based inks, although not much different from the self-polymerizing, but are curable, need a heated dryer, and as a result the printing can withstand high temperature washing, without fading. The prints are permanent. They have a soft feel to the touch. Water-based inks are of transparent nature, and thus we cannot print on dark T-shirts and textiles. Textile Plastisol inks are the best option to work with, as they are very flexible, even though their viscosity is somewhat very dense. Plastisol inks are transparent and opaque as well. Some companies even produce semi-opaque ones. Moreover, Plastisol inks come in standard effects, for embossed prints, suede finish, glow-in-the-dark, pearlescent, glitter, silver and gold, glossy and UV reflective. These inks do not dry on the screen, so if we're working, and we need to leave for some time, we can leave everything as it is, and come back and continue later. So, this is very convenient and less stressful as the tiny openings on the screen, like half-tone dots, will not clog. Plastisol can also leave the soft feel to the touch in printing, by means of adding some softening additives. Plastisol inks are very versatile to work with. These can also be used for printing on dark T-shirts and textiles, and can also be used to print with the white-base system for black T-shirts and textiles. (to print with the white-base system, you would need what is called a "flash cure unit", (which we have already mentioned). Maybe, we will find that the only disadvantage with Plastisol inks, is that they are sometimes hard to mix, due to the low viscosity, especially in the opaque colours.

## Indirect printing on t-shirts and textiles

There is yet another way how we can print on T-shirts and textiles but not in a direct way. This is called a “HEAT TRANSFER SYSTEM”.

What does this consist of? Here is the answer.

Heat transfer consists of a specialized carrier paper (siliconised) and the same print as you would use on T-shirts, but it must be printed upside down (like a mirror image) on the paper. The colour sequence is also mirrored, and in fact, if we had to print “directly” onto T-shirts, and we needed to print an underbase white, we would print that first on the T-shirt. With heat transfer, while the underbase white, would be printed ‘last’. You would print the colours first in a mirror mode, and then finish with a white base, which will cover the parts of the design. Hope we got the idea!

## Artwork for Heat Transfers

Preparing the artwork for heat transfer is not so complicated although it's not what one may term as so easy and straight forward, so that is why it is always emphasized that the end result will be as good as the artwork. It is imperative that the designer will know the process of screen printing and also the heat transfer production. The designer, must understand which colour goes printed first, and which layers of colours will be printed in sequence. If the transfer is going to be printed onto “POLYESTER” material, then an “added” layer must be printed on top of the “whitebase” so that, when heat is transferred, by means of a “heat press” the colour of the material, which in this case, is polyester, will not “migrate” into the ink. If that happens, and we have a lot of white in the design, the end result will no longer have a white colour, but it will be stained with the colour of the material. So it is important that if you know that the heat transfer is going onto polyester, and apply another layer of specialized ink, on top of the white base, so as to stop the material’s colour from migrating into the white ink layer. Screens for transfer printing are also a determining factor of how good the print will be, when heat transferred. You would need to use high-count meshes, say from 90T – 140T, for colours, and 55T – 62T for whites and the covering layer for dye migration which goes on top of the white, (if it is being printed on dark and polyester materials).

There is a lot to say about heat transfers, especially when we want to have a photograph production. But since this is for advanced users, will leave it later on for the advanced course in screen printing, as that will involve a totally different approach on how to produce the artwork, the films and the screens. For the time being, let's stick to the basic principles, how screen printing works so you can start printing with the least possible expense.

Each colour that you print on the heat transfer paper, must be dry to the touch.

There are inks available that you can “air-dry”, which means when you print onto the paper, and put on a rack of shelves to dry naturally, which process normally takes about 20 -30 minutes to dry to the touch. When the printing is ready and all colours are printed, we will need a “heat press”, which approximately has a size of an A3 paper, set the temperature to about 170 – 185 degrees Celsius and set the pressure to medium hard (if manual). Then when the temperature reaches the selected level, we can put the t-shirt (front-side up) onto the rubber base of the heat press, position the heat transfer paper, (face down) in the center of the t-shirts about 10cm down from the neck seem, and close the press, for about 12 – 20 seconds (depending what type of heat transfer) after turn-off, open the press and “peel-off” the paper from the t-shirt, and there you will have a nice bright print, which is then washable. The result will have a smooth thin plastic feel. and would be of an excellent print quality. Heat transfer printing can be very rewarding and very profitable because, once an order is received, say for 150 prints, you can actually print another 150 prints and keep them in stock, saving them for any possible re-order.. That way, we save from setting up and print directly and immediately.. Keep in mind, that you can print on anything, including baseball caps, with heat transfers. We can now imagine, how wide is the use of heat transfer printing. We could always produce prints for someone, who already has the heat presses, and you can do the printing of the transfers. For example, a musical concert, where thousands attend can be a good source of vast earning possibilities!

### **Possibilities are endless with screen printing.**

Just to wind up this course, please realize that screen printing possibilities are endless, as we can print on anything. We have to use our imagination of how to expand our services for engaging in screen printing which is very vast, it's fun and very rewarding if you

only insist on giving quality prints. I can offer all help in many ways and assist you to acquire or can even supply the artworks for ready-for-film output, that means ready-made colour separations. Regarding colour accuracy, always refer to your clients with the Pantone Colour Matching system.



This is an international standard colour swatch book, which you can easily integrate with screen printing inks. You can get the colours by selecting the inks, from your ink supplier. Please, don't hesitate to ask me for guidance in this as I can lead you all the way through, so you would be able to manage easily and simply.

## Conclusion

In this course, I tried to give as much information as I possibly could, assuming that you are a beginner. I started out with outlining the process and how to get the ball rolling with the least difficulty and expense. If you do not envisage doing all things by yourself, like for example, stretching the screens, I advise you to buy ready-stretched screens, as these will be stretched by pneumatic machines, and would be of high strength stretch, which is more appropriate and yield better results in printing and colour registration. They are not that expensive, and you can recycle the screens by the process of washing away the screen emulsion by screen remover (bleaches). I must here recapitulate about the requisite equipment that for sure you would need, which would include:

Exposure unit, squeegees, pallet knife (to mix inks) inks, drying racks, weighing scales Some handy bench so you would comfortably do the printing. An Inkjet printer, preferably in A3 size print area.

This investment is not of an exorbitant expenditure and you can rest assured that you will not only get back what you invested, but you'll get much more, and for sure, you would be investing more and want to grow more for a fruitful enterprise..

As I mentioned earlier in the course, my assistance will cover all aspects of all you would be needing. All is needed is sending back your reference and any possible orders for logo designs and I will help you produce all the artworks you will need. Do not hesitate to ask for any quotation for all requested commissions. My contact details are as follows : [screenprinter@europe.com](mailto:screenprinter@europe.com)

There will be more editions of these courses to follow, thus Second Edition focusing on T-Shirts and Textile Printing.

While looking forward to hearing your news, I send all my highest regards

**The Author  
Patrick**