Printex
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evolve

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Tips of the MONTH

Opportunities are usually disguised as hard work, so most people don't recognize them.

Ann Landers

"To accomplish great things, we must not only act, but also dream; not only plan, but also believe."

Anatole France

No man will make a great leader who wants to do it all himself or get all the credit for doing it.

Andrew Carnegie

"A mixture of admiration and pity is one of the surest recipes for affection."

~ Andre Maurois

5 TRENDS in Screen Printing Process

Bhargav Mistry

Trend No. 1:
Fast changing image of screen printing:

The very mobile or high end smart phones or iPods, tablets that you are holding in your hands have the imprints of screen printing. The helmets you wear, the bike you ride have designer decals on both sides; the car you drive has the speedometers and dashboards – all screen printed. If you are a cricket fan, notice that almost every bat has multiple designer stickers screen printed, and t-shirts, helmets, PVC cheer sticks, balloons, or flags that the cricket fans are holding in the stadium – all screen printed. And do not forget, we are living in high technology electronic age. Every electronic product that you use has a PCB (printed circuit board) inside, screen printed of course.

A high level team of printing company engaged in automobile and aeronautic decals printing and high end graphics, walked into Grafica's stall at Gulf Print & Pack'13 in Dubai. During the discussion, the gentlemen did not mind sharing with our team that they have as many as 30 semi – automatic and fully automatic screen printing machines! This is the quick glimpse of fast changing trend in screen printing.

So, screen printing is more than what people may tend to think about printing visiting cards, letterheads, invitation by using out dated and tedious method what we call "manual screen printing". Screen printing is an artistic as well as technology oriented process. From its age-old method, 'silk' screen printing has transformed into an advanced technology.

Its distinct advantages: It has its own distinct advantages: versatility, suppleness, wide range of applications, brightness and solidity of colours of outdoor applications, possibilities of special effects in graphic and textile; and wide range of presses available for different applications – Multi – colours press very large size for graphic applications; Multi-colours rotary screens to print textile in roll; possibility of combination with other imaging or printing process (offset, digital, etc.).

The visual impact that screen printing process can create is simply incredible. The durability of the inks, the vibrancy of the colours, especially considering the harsh outdoor weather conditions for outdoor applications such as automobile decals, helmet stickers, indoor/outdoor advertising display boards, etc, (it withstands sunlight, rain, snow, wind, etc).

Applications, unbound: Screen printing has wider applications in commercial graphics (packaging included), industrial (almost every industrial segment needs the imprint of screen printing process), garment decoration and textile printing as summarised below. (It is virtually impossible to list out total number of applications of screen printing process).

Commercial Applications:

- Posters
- Billboards
- POP/POS
- Displays
- Stickers/Labels
- Signs
- Flags
- Packaging
- Value addition on offset printed commercial and packaging.

Daily necessaries:

- Toys
- Stationery • Sports goods
- Art (Serigraphy)
- Cosmetic containers
- Toiletry containers
- Wooden products
- Glass & ceramics
- Plastic Cards, Credit Cards
- Foot wear

Textile:

- Sportswear
- T-shirts
- Ladies/Mens/Kids wear printing (full fabric printing)
- Textile printing
- Heat transfers/Tag-less labels
- Caps
- Jute bags
- Cloth bags
- Garment tags, stickers
- Packaging for Garments/Saree/clothing

Industrial applications:

- Automotive decals
- Automobile meters
- CDs
- Parts of electric appliances
- Membrane switches
- Liquid crystal display
- Automatic vendors
- Metal name plates
- Print Circuit Boards (PCBs)
- Hybrid Circuits
- Solar Cells
- Mobile keypads, iPod, iPads
- Medical patches and many more…

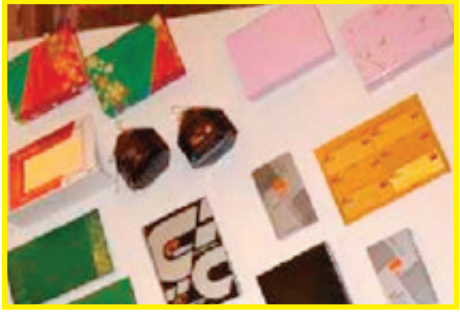
Trend No. 2:

Advancement in screen printing technology comes of age:

"Necessity is the mother of all invention." And that applies to screen printing as well.
So, now there are:
1. Screen printing machine (semi-automatic or fully automatic – alas NOT MANUAL tables anymore!)
2. Screen making set up thatincludes: polyester yellow mesh or fabric (alas NOT nylon mesh anymore); fabric stretching unit with tension meter; aluminium frames (alas NOT WOODEN FRAME anymore), emulsion coating equipment; screen exposing machine; screen drying unit, and other accessories.
3. The screen that is the imagecarrier (considered the 'heart of screen printing')
4. Squeegee (the 'heart of thescreen printing machine') supported by a ink coater
5. The substrate on which youprint which depends on the job. (Screen printing process can be used to print on numerous paper and non- paper substrates – both semi- rigid and rigid – pvc, wood, glass, tile, ceramics, fabric, metal, etc).
6. UV Inks, varnishes, UVspecial effects (and emulsion and chemicals needed for screen making) (to be forbidden solvent ink wherever possible since it is hazardous)
7. Drying system to print,depending on the ink used (UV curing, IR/Jet Air/Wicket Dryers as against racking system which requires huge space.
8. QC tools (like tension meter, UV thickness meter, spectrometer, etc)

Trend No. 3:

Emergence of Multi-process printingsolution & fast spreading value addition concept:



It is believed that screen, offset and digital printing will co-exist for different types of jobs. These days, many offset printers are 'falling in love' with screen printing as witnessed by us during various printing exhibitions. In the last couple of years we received more visitors from offset, packaging and digital than screen printing.
Perspective
1. Digital-screen combination: This is yet another good sign. There are many digital printers who have also screen-printing units to meet the market demand for 'total print solution'.
2. Offset-screen combination for VALUE ADDITION:
3. Digital, offset, screen combination.
There has been a growing trend of many offset printers and packaging printers embracing screen printing process for carrying out print finishing in house instead of depending on outsourcing.

Why value addition?

Sharjah based Silver Point Printing Press has recently bought one more Swing Cylinder Press with inline UV from Grafica to meet the non-stop and growing demand for value addition which is offered with the application of various decorative UV to give touch and feel effect over duly commercial and packaging jobs.
In today's highly competitive business environment, print buyers are certainly looking for something different which really differentiates them from their rivals. Ultimately, the packaging in a shelf carries its look, its power of attraction for the consumers, and eventually the feeling of touch, or we can

rightly say, today packaging is all about sensation – look, touch, feel, smell. Same principle applies to all commercial jobs other than packaging – value addition is a must.

The most promising is the use of a wide range of 'special effects' thanks to the think tanks in the screen printing industry driven by FESPA, an international association of various national printing associations including India.

UV Special effects currently used in the market are:

- Commonly used UV Matt and Gloss
- Pearl
- Metallics
- Fluorescent (glow in the dark)
- Scents / Rub and sniff
- Emboss
- Glitter (silver and gold)
- Sand
- Sensation
- Abrasive
- 3D reflective
- Crystal
- Rough finish
- many more…

Trend No. 4:

Focus on Quality, productivity & Standardisation:

Today, with automatic precision machines, it is possible to get a result that years ago would have been a pipe dream. For example, by manual screen printing reproducing photorealistic images on t-shirts was next to impossible, but now with automatic direct to garment textile screen printing machines, garment printers are able to print what the customers want with speed and accuracy.

In India, many of the large screen printing units are matching to international standards, and beyond, in a competitive marketplace because of use of high-level equipment and high – priced consumable supplies.

The industry (customers) allows minimum tolerances for the rejection besides mandating for Just in Time production and deliveries. Today, there exist different systems designed to help the screen printers to achieve better result. But it revolves around the simple concept or standardisation of the entire screen printing process.

Also, Screen printing industry is now waking up to the reality of UV-age. More and more screen printers are now adopting UV and dumping the foul smelling solvent which many feel a curse to the screen printing. Yes in some areas such as decals and industrial printing UV has not made successful inroads and still they have to use only solvent inks.

Shift from manual to automation: In the last decade, there has been steep increase in the number of screen printing machines and UV curing system (also screen making set up) sold in the last couple of years than it was five to ten years ago. There has been a big shift from manual to semi-automatic and now fully automatic system. More and more printers are now adopting automation and using quality raw materials, process standardisation, documentation of parameters for each job since in screen printing every job is a new job involving unique process parameters, use of materials (inks, chemicals, mesh, etc) with different specifications.

Over 50 companies engaged in garment manufacturing as well as garment printers (job workers), and also jute bag manufacturers, have installed our automatic direct to garment screen printing machine along with complete screen making system who had huge manual long tables.

Trend No. 4:

Growing urge for Education and training:

Screen printing is now quicker, cheaper, produces better quality images and offers a number of special applications. Having advanced machines in place is not sufficient to run a profitable screen printing business. Being able to truly master printing high quality images, using the screen printing process, also takes much longer, because there are a number of variables involved.

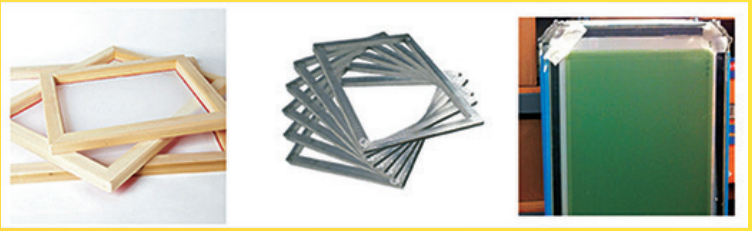
Conclusion:

I would conclude by saying that while technology is the lock, education is the key to unlock the numerous opportunities in screen printing. I leave the screen printers to decide whether to take both (technology and education) or anyone! Those who grab both will stand winners in the market.

SCREEN-MAKING *Techniques*

A review of the components and procedures required to produce the best quality screens.

April 16, 2015
*By **Rick Davis**, Contributing Writer*



Shown here are the three primary frame formats used in screen printing (left to right) — wood, tubular aluminum and retensionable.

I wholeheartedly believe that if our industry held one philosophy above all others, scrape rates (misprints) would drastically decrease and profits would subsequently increase.

That philosophy is: "The quality of the finished printed garment is directly proportional to the quality of your screen."

The screen is at the heart of the screen-printing industry. The effort put into this one critical component will have the greatest impact on the finished product as it emerges from the dryer. Since there is no one manual to which novice textile screen printers can refer, most are steered in the direction that their salespeople lead them. The simple fact is that where the screen is concerned, it is quality in, quality out.

Let's review the components and procedures required to produce the best quality screen for your shop.

THE FRAME

The frame is the base for the entire textile screen-printing process. This is the first decision a printer has to make with regard to his commitment to quality when setting up his shop.

Wood frames. This type of frame offers the most economical means of stretching and printing. However, as with anything important, you get what you pay for. Of the three frame formats available, wood frames have a life span that require replacement at a certain point. Tubular aluminum and retensionable frames, however, have indefinite life spans.

The initial tension that's achievable on a wooden screen can allow for quality printing to a degree, but the tension loss from frame deflection during printing wears on the frame and mesh. It will require restretching the mesh in a shorter period of time as opposed to the other frame options.

Tubular aluminum frames. These frames offer a greater advantage for screen printers because they do not bow over time from the constant stress of the mesh, and will not absorb water and chemicals from repeated cleanings and reclaimings. You typically also will achieve a greater initial tension when using tubular aluminum frames. The higher achievable tension will allow many advantages, which only increase in relation to the screen's tension.

Although tubular aluminum frames cost about twice as much as wooden frames, they will not require replacement. The downside here is that once the mesh is adhered to the frame, the screen tension can go in only one direction: down. Inevitability, the mesh tension will drop to the point to where it must be removed and restretched.

Retensionable frames. These frames offer the greatest advantage for screen-printing quality for a wide variety of reasons, but the primary one lies in the name of the product itself. They are retensionable, which allows you to monitor the screen tension from run to run and retension the mesh when its tension drops below a given point. This drastically lengthens its life span.

The other advantages include:

- Greater mesh mileage
- Lower off-contact distances
- Lighter squeegee pressure
- Faster squeegee speeds
- Increased resolution
- Thinner ink-film deposits
- Softer hand
- Thinner emulsion coatings
- Lower emulsion consumption
- Faster exposure times
- Decreased reclaiming chemical consumption.

In many cases, the selection of frames for some shops is a decision made strictly based on financial restrictions. Though it may save money on the initial investment, going the cheaper route will cost more in the long term. Putting the previously mentioned benefits of retensionable frames aside, they will pay for themselves in six months in mesh savings alone.

Regardless of the frame you choose for your facility, always strive for the highest tension achievable for the frame with which you are working. Although reaching and maintaining the manufacturer's recommended tension level is easy with retensionable frames, printers using static frames will need to monitor the screen's tension over time.

SCREEN PREPARATION

Degreasing and emulsion-removal techniques play a critical role in making a quality screen. The screen requires a complete degreasing prior to the first coating. This is a repetitive process, where attention to detail can be lost in a short period of time. This (as well as every aspect of the screen-making process) requires written procedures that must be adhered to from screen to screen. Shortcuts are not acceptable.

The first tool required for this process is a good pressure washer — an industrial-strength unit with a 2,000-2,500 psi capacity. Smaller units will require more time to properly process a screen and could slow productivity. When degreasing or reclaiming a screen, always work from top to bottom with the pressure washer. The objective is to thoroughly clean and remove all residue from the screen mesh's surface. Since the majority of the stencil resides on the print side of the screen, follow these steps:

- Process the initial reclaim procedure from the ink side of the screen first.
- Repeat the process on the print side.
- Starting at the top, thoroughly rinse the frame on both the print and ink sides of the screen.
- Rinse both sides from top to bottom to ensure there is no residual emulsion left.
- Inspect.

Use a backlit washout tank during the reclaiming and degreasing process. This allows for section-by-section inspection and eliminates the need for a separate examination at the end of the process.

Once properly degreased, place the screens on a drying rack prior to coating. This rack should have its own area that is located away from the contaminated production area, but also not near the freshly coated screens. Once dried, they are ready for the coating procedure.

COATING TECHNIQUES

Coating procedures vary from facility to facility since there is no hard, fast rule regarding a correct or incorrect method. The objective of the coating procedure is to properly encapsulate the mesh in an emulsion coating with

the stencil thickness on the print side of the screen.
You want the stencil thickness to be on the print side of the screen. This dictates that regardless of the coating combination you use, you will coat the ink side of the screen last. This process will push the emulsion coating to the print side. Otherwise, your stencil thickness will reside on the ink side, which will result in numerous printing issues, starting with the ink not properly releasing from the screen. You should maintain a thin emulsion coating when printing on finer mesh counts. This will allow for high resolution and faster exposure times.
Coating Variations
First Side Last Side
Print Side Ink Side
1 1
1 2
2 1
2 2

The chart above shows the variations in coating procedures used in different facilities. These vary based on the desired end effect. You typically would not use the 2/2 method unless you desired a thicker ink film. For printing standard wet-on-wet applications with mesh counts ranging from 160 to 230, I prefer the 2 print/1 ink. On mesh counts finer than 230, I would use the 1/1 application.

Coating speed also is important. Remember to pass the screen coater over in a medium and consistent motion. Doing this too slowly will result in emulsion spilling from the sides the coater. Do this too quickly and you will start to entrap air (bubbles) inside the mesh openings. This will result in pinholes either when the screen is washed out following exposure or — even worse — on the press. The most important aspect here is to coat the ink side last to ensure the stencil is on the correct side of the screen.
The one way to eliminate the human variable of the screen-coating process is to purchase an automated coating system. For those doing it manually, establishing the proper procedures to control and maintain the quality of your screens will only add to your facility's productivity and profitability.

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