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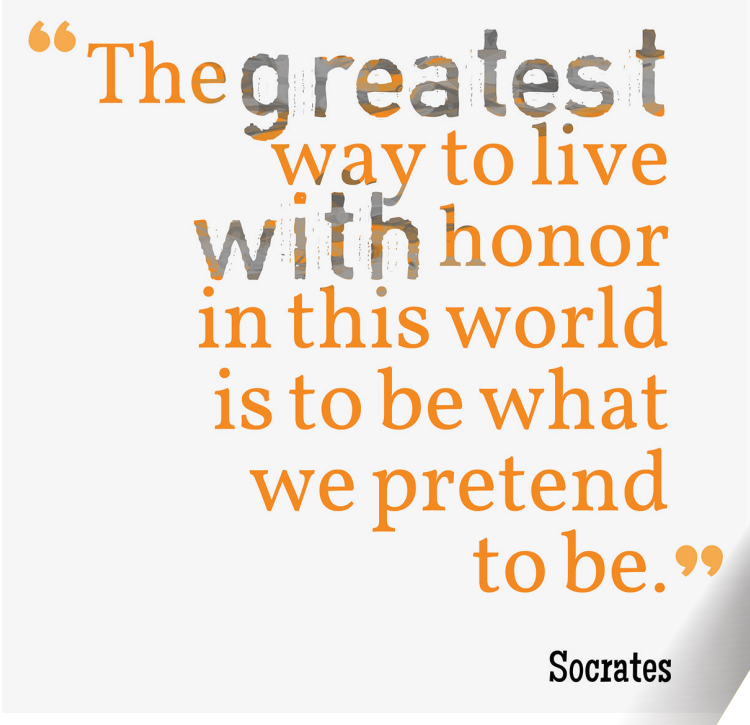
The man who acquires the ability to take full possession of his own mind may take possession of anything else to which he is justly entitled.
~ Andrew Carnegie

The results you achieve will be in direct proportion to the effort you apply.
~ Denis Waitley

Advice is sometimes transmitted more successfully through a joke than grave teaching.
~ Baltasar Gracian



The removal of ink trails or 'dribble' lines from prints.

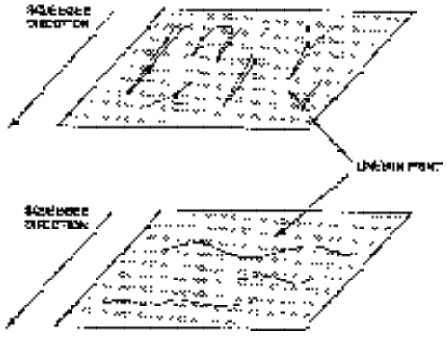
SERICOL
Hints & Tips
Advice from Textile Technical Service

Background

With the advent of high definition screen printing inks such as Water-based UV systems there has been a move towards finder meshes to increase coverage and improve print quality. This has led to the increased likelihood that, under certain conditions, a printer may experience problems with the appearance of ink trails or dribble lines in the printed ink film. These may show themselves in two ways :

1. Dark lines running through the print in the direction of the flood/print stroke.
2. Dark wavy lines running across the print horizontal to the flood/print stroke.

Diagram



These lines correspond to areas where ink has dropped from the flood coater or the squeegee during the print or flood strokes leaving a thicker layer of ink on certain parts of the screen. The thicker layer then print as a dark line or streak.

If we examine the behaviour of screen inks during the flood/print stroke it is clear that many types of ink drop or 'dribble' from the coater and squeegee onto the mesh during this cycle. Fortunately most Solvent-based inks do not show up these ink trails since the printed ink film is thicker due to the coarser mesh counts used to print them. The highter film thickness effectively disguises these marks.

With the combination of thin high definition ink and mesh the ink flows less freely through the screen resulting in a slightly lighter print that might be expected. In the areas where the ink has dribble onto the screen from the squeegee or flood coater a thicker layer prints a little darker showing itself as a dribble line or trail.

This problem is primarily one of ink starvation or general poor flow through the mesh. This results in the ink printing colour density in areas where ink has fallen from the flood coater or squeegee onto the mesh.

Possible Solutions

1. Thin the ink more- this will not stop the ink dropping from the coater/squeegee but will faciliatate greater ink flow through the mesh, thus hiding these trails.
2. Slow the machine down- slowing the print and flood strokes often eliminates the problem.
3. Change the squeegee conditions by :

   (a) Using a little more pressure.
   (b) Using a lower, less upright angle
   (c) Using a softer rubber.
   All of the above will increase ink flow through the mesh.
4. Reduce the gap between the squeegee and the flood coater and make sure that the gap is full of ink at all times.
5. Varying the flood thickness (both thicker and thinner) may sometimes help to eliminate ink trails depending on the type of ink being used.
6. Probably the best solution is to use a higher deposit mesh, preferably one with a greater percentage open area, to allow the ink to pass more easily through the mesh onto the substrate.

   eg. moving from a 150.34PW to a 150.31PW a 140.34PW may help.

The above recommendations should help in reducing the appearance of dribble marks or ink trails, either when used singly or in combination with one another. If you are still unable to obtain a satisfactory print after trying these suggestions please contact Technical Services on the telephone number given below.

What Are Managerial Skills?

Simply, ***managerial skills represent a knowledge and ability of the individual on a managerial position to fulfill some specific managerial activities or tasks.*** This knowledge and ability can be learned and practiced. However, they also can be acquired through practical implementation of required activities and tasks. Therefore, each skill can be developed through learning and practical experience from the individuals.

There are many definitions about skills that talk about talent. Talent is something personal related with an individual and represents a native gift from the nature about that something inside that talented persons. All persons cannot be artists. Usually, artists are born with the gift of art, but despite their talent they continue to develop their talent to improve their art skills.

When we talk about managerial skills, we talk about skills of a manager to maintain high efficiency in the way how his or her employees complete their everyday working tasks. Because of that, ***managers will need skills that will help them to manage people and technology to ensure an effective and efficient realization of their working tasks.***

Three Types of Managerial Skills

Robert Katz identifies three types of skills that are essential for a successful management process:

- Technical,
- Conceptual and
- Human or interpersonal managerial skills.

Technical Skills

As the name of these skills tells us, they give the manager's knowledge and ability to use different techniques to achieve what they want to achieve. Technical skills are not related only for machines, production tools or other equipment, but also they are skills that will be required to increase sales, design different types of products and services, market the products and services…

For example, let's take an individual who work in sales department and have high developed sales skills obtained through education and experience in his department or the same departments in different organizations. Because of these skills he possess, this person can be a perfect solution to become sales manager because he has great technical skills related to sales.

On the other hand, one person that become sales manager immediately will start to build his next type of required skills, because if his task until now was only to work with the customers as sales representative, now it will need to work with employees in sales department as addition to the work with customers.

Technical skills are most important for the first-level managers, but for the top managers, these skills are not something with high significance level. As we go through a hierarchy from the bottom to higher levels, the technical skills lose their importance.

Conceptual Skills

Conceptual skills present knowledge or ability of a manager for more abstract thinking. That means he can easily see the whole through analysis and diagnosis of different states in order to predict the future of the business or department as a whole.

Why managers need these skills?

As a first, an company have more business elements or functions as selling, marketing, finance, production… All these business elements have different goals even completely opposed. Think about marketing and production as a business function and their separate goals. You'll see the essential difference. The conceptual skills will help managers to look outside the goals of a single business department and make decisions that will satisfy overall business goals.

Conceptual skills are vital for top managers, less important for mid-level managers, and not required for first-level managers. As we go from a bottom of the managerial hierarchy to the top, the importance of these skills will rise.

Human or Interpersonal Managerial Skills

Human or interpersonal managerial skills present a manager's knowledge and ability to work with people. One of the most important management tasks is to work with people. Without people, there will not be a need for existence of management and managers.

These skills will enable managers to become leaders, to motivate employees for better accomplishments, to make more effective use of human potential in the company and so on. Simply, they are the most important skills for managers.

Interpersonal managerial skills are important for all hierarchical levels in the company.

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These are the basic skills required for a successful management as a process. Some authors also mention other skills that when I am thinking about, they are simply part of these three primary skills.

Let's take an example with controlling skills. The controlling can't be a skill, but rather a process, or one of the managerial functions. Managers perform controlling through their interpersonal managerial skills that we already described. Other additional skills that I find in the theory are decision making skills. Again, decision making is a process and not the skill. When we have conceptual skills, we will make a better decision. Furthermore, when we have technical skills, we will make a better technical decision. Because of that I think that the basic skills all managers will need are skills explained as technical, conceptual, and interpersonal managerial skills.

At the end, I want to note something about managerial skills and business potential energy. Better managerial skills in your company will produce larger business potential energy. Because of that, this type of skills are in the category of business elements that can increase your business potential energy.

Screen Print

Performance Fabrics

By: Ed Branigan

There are several factors to consider when printing performance fabrics. First, it is important to research the content of the fabric itself—get to know the components and the ratio of the blend between them. This will help determine which ink and what parameters to use for any print application.

The stretch ability of the fabric, its ability to withstand the heat required to cure plastisol, and its propensity to bleed all need to be thought out beforehand. The second, but equally important factor in determining print parameters is to understand how all three of those issues are related.

A third critical factor that requires attention involves temperature. Print practitioners must comprehend how the temperature required to bond a polyester dye to the yarn relates to that required to cure plastisol ink. Here, we'll take a look at all of these facets of printing athletic and performance garments.

The anatomy of a fiber

Screen printing directly onto performance or athletic fabrics has always presented its own unique set of problems and complications. Most athletic jerseys were traditionally made of 100 percent polyester or some polyester with a blend of a stretchable material such as spandex. We can think of these as the original performance fabrics, in use before the word "performance" entered the textile printing vernacular.

Polyester dye migration was and still is the most common issue to be dealt with in terms of these fabrics, but other problems, such as fabric stretch and, in many cases, the construction of the garment itself, persist.

On the market in recent years, we've seen a newer generation of fabrics for sports. Comprised of advanced synthetic materials, moisture wicking and compression garments (made famous by manufacturer Under Armour), these are mostly very heat-sensitive and notoriously difficult to screen print. Also in this new generation is a variety of substrate blends that includes polyester, nylon, tactel nylon, spandex, elasticine, rayon, Lycra and others. The major difference between these and the older athletic materials is that the stretchable fabric portion of the blends is higher and some are more heat-sensitive.

Now that we know what styles we're talking about, let's consider its makeup. Imagine a single thread of polyester yarn stretched out taut and viewed under a microscope. It will be smooth like fishing line. Now imagine a single thread of cotton yarn stretched out and viewed in the same way—you'll see tiny fibers overlapping each other. Because it is a natural, as opposed to synthetic, material, it absorbs dye pigments easily. The liquid can soak into and between the fibers easily and attain a mechanical grip.

Polyester, on the other hand, is a synthetic material. It does not absorb easily and thus that same mechanical grip cannot be achieved. It needs help, and usually gets in the form of chemicals that "heat seal" the dye onto the material. The temperatures used to do so are usually in the 230°F to 260° F range. Pay attention to these numbers; they will come back to haunt us.

Considering cure

Plastisol textile inks have three main components that comprise the body of the ink—resin, plasticizer and pigment. Some inks also contain fillers or additives to enhance certain specific characteristics of the ink (low bleed or gloss, etc.), but the aforementioned are the essentials.

Resin typically comes in powdered form while the plasticizer is a liquid. These are mixed with the pigment to give the mixture its color. Once the resin and plasticizer are combined, the mixture will often stay wet for a long time. (Note that plasticizer also has a tendency to separate from the resin if left sitting—evidenced by an oily residue sitting on the top of the ink in the bucket. Simply stir the ink to mix them back together.) Plastisol textile inks, unlike water based inks and paint, require direct heat in order to achieve cure.

Here, it is perhaps more appropriate to use the term "fuse" instead of cure, though. When we print plastisol onto a garment and run it through the dryer, the ink on the shirt is immediately hit with a blast of heat. The ideal temperature is 320°F (compare this number with the 230°F required to set a polyester dye).

The length of the dryer tunnel is important because the ink needs to have heat applied to it for a set period of time, typically one minute. As the garment passes through the dryer, the temperature rises quickly. The ink begins to gel from 180°F onward. The resin beings to swell and absorbs all the liquid elements (plasticizer). At 300°F to 320°F, the resin has absorbed all of the plasticizer and the ink is considered fully fused/is 100 percent solid. This is also known as cross-linking.

The problem with polyester: dye migration

The biggest challenge for those who work with polyester garments is dye migration. The degree of risk is mostly determined by the amount of polyester in the garment and the quality of the polyester dyeing process. Ironically, this most important variable in the whole process—the dyeing of the polyester fabric itself—is the one that we have the least control over. We can only try to deal with the garments that are supplied to us as best we can. Some colors are also worse than others—red is the most notorious, but black and navy, along with other colors that potentially contain red pigment dye, such as maroon, can also be problematic.

To describe the process, let's break down the worst-case scenario—a white logo print onto a red, 100 percent polyester performance garment. We print our base plate, flash, then print our second white. The garment enters the dryer with a bright white print.

The dryer temperature is set at 320°F. It takes one full minute for the garment to pass through the dryer. Within seconds of coming out the other end, the hue of the ink is changing. Within minutes it turns a faint pink, within hours or days it is completely pink.

What happens is that, when the temperature in the dryer reaches the 230°F to 260°F threshold required to set the polyester dye, the dye pigments again become sublimated (or turn into a gas). The plasticizer in the ink then "pulls" the dye pigment up into itself and changes the color of the ink.

Polyester dye pigments with a high molecular weight are less problematic because the size of the dye molecule is too big to pass through the gaps and crevices in the larger expanding resin and plasticizer molecules. Dyes of a lower molecular weight are small enough to pass through and will even continue to do so days or weeks after the ink has become fused.

Even though fully-fused plastisol is considered to be 100 percent solid on a

microscopic level, this is not necessarily the case. It is only when extremely magnified that the tiny gaps become visible. Polyester dyes with a lower molecular weight can pass through those tiny gaps and be absorbed into the ink.

What to do?

Low-bleed plastisol inks are the primary agent used to combat polyester dye migration. These inks are engineered using additives that specifically try to block the dye from migrating up into the ink. There are various degrees of success depending on the additive. Some work better on 50/50 polyester/cotton blends while others show promise on 100 percent polyester. All of the major ink manufacturers will carry several different versions of low-bleed inks.

It is important to remember that a "no bleed" ink doesn't exist. While great strides have been made in the chemistry, low-bleed plastisols have never achieved a 100 percent success rate. There are always rogue polyester fabrics out there that refuse to be beaten, especially true of the newer synthetic fabrics and the blended styles in particular.

So the most effective way to control polyester dye migration is to control the heat. The key is to stop the dye from releasing from the polyester yarn in the first place and to get the plastisol inks to fuse at as low a temperature as possible. This is a tricky maneuver, as plastisol inks that are not fully-fused will crack after washing and the uncured plasticizer could tug on the polyester dye and take some in.

Hence, we've seen the development of newer low-bleed, low-fusing inks that fuse at temperatures as low as 275°F (the threshold at which the polyester dye pigments get re-sublimated). By keeping the heat below that threshold and incorporating bleed-blocking capabilities of the ink, there is much less risk for migration.

It is critical to understand the relationship between plastisol's cure temperature and the temperature at which polyester dyes are set. Avoid production temptations to turn up the dryer heat and speed up the belt. Once plastisol ink has hit the minimum temperature required to fuse, it simply needs to maintain that temperature for a set period of time to become 100 percent solid.

As far as dye migration is concerned, heat is your enemy and time is your friend. Lower the temperature of the dryer and give the garment more time under the heat. Keep the temperature lower to lessen the risk of the polyester pigment dye escaping.

Stretch factor

Stretch fabric is another variable. The type of material used is important, whether it's elasticine or spandex, for example, but so also the amount. The ratio of stretch material in typical blend is critical and can be anywhere from 5 to 20 percent.

There are several options with regard to stretch additives from which to choose; most are effective and easy to use. Here's the catch though: diluting a low-bleed or low-fusing ink may inhibit its most important characteristics. Here is where you test, then test again.

Adjusting a low-bleed/fuse ink to accommodate stretch requires a delicate balance. You must adjust dryer temperatures and determine whether the ink is fused, as well as decide how long to wait to see if the garment is going to bleed. It can take hours, days or sometimes weeks for dye migration to occur. A good rule of thumb is to print on Friday and reevaluate on Monday.

The trick to achieving success when printing on performance fabrics is to realize that the answer is in the process. Understanding the process is the key. There is no single solution.

Towards Innovation

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