

Breaking The Polyester Barrier
With Sublimation

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A Note From The Speaker

Thanks for registering for my class, I think you will find it very worth your while and look forward to the opportunity to share my experiences with you.

I have created this handout as a supplement to the class, rather than as an exact outline of the presentation. I have a tendency to “fine-tune” the direction of the seminar based on the profiles of attendees, which means I may spend more time in some subject matters while skipping other topics (when warranted). Thus, I may not follow the handout as it’s written. Think of the handout as a resource, rather than a script.

Another point I wish to make, is that I prefer you to focus on the live content, rather than trying to follow along in the handout. I use lots of projected images and actual samples (when possible) so if you aren’t paying attention to the front of the classroom, you might miss something important. Plus, it would be impossible to document every bit of information that gets shared in the class, so if you are reading the handout trying to figure out where I am going next, you might get behind and miss out on something useful.

One final note, all of the information applies to printing and embroidery, though there may be some slight differences in format, categories, and production references.

With that said, I do encourage you to print the handout and bring it to the class so that you have something to write your notes on, but don’t let it distract you from listening and asking questions.

Jimmy Lamb

Breaking The Polyester Barrier With Sublimation

No doubt you have heard over and over again, that sublimation will not bond to cotton. Well to tell you the truth, that hasn't changed. Sublimation chemically bonds to polyesters and polymers only, but that doesn't mean you can't apply it to other surfaces under the right conditions. New developments in the marketplace have yielded new products that can be used to apply sublimation dye to the surface of cotton, vinyl, flock and twill.

In the true sublimation production process, the dye bonds at a molecular level with polymers, which means in the case of apparel it is subsurface rather than on the surface. The end result with true sublimation bonding is that the dye will not crack, peel or fade when laundered.

In the case of products that allow you to apply sublimation to non-poly products, the image will be on the surface instead of in the surface, and may crack, peel or fade over time. But that's not really a bad thing considering that traditional forms of decorating such as screen printing and DTG also have a tendency to degrade over time.

Several new sublimation to non-poly substrate products have hit the streets over the past few months. Typically, they fall into one of two categories – transfer paper or printable material. We will take a look at both types in this class.

Sublimation On 100% Polyester Apparel

Before we investigate some of the new processes, we need to first review and understand traditional polyester apparel production.

When sublimating 100% polyester, you will get the full gamut of color (that your system delivers) so that your images are vivid, detailed and precise. These images are embedded in the surface and you cannot feel the ink if you run your fingers over them. The actual fibers of the fabric have been recolored from the inside out so the ink color is permanent and virtually indestructible. Thus, your images will not fade, crack or peel when laundered. The sublimated image will outlast the shirt itself.

However, it should also be noted that all polyester products are not created equally. Some will sublimate better than others, so never assume that just because something is 100% polyester that it is a good candidate for sublimation. (I will explain more in class.) You will need to experiment with different brands and styles to figure out which ones work the best.

When sublimating 100% polyester products, the greatest challenge is avoiding "transfer lines". A transfer line is a razor thin line that appears where the edge of the transfer paper makes contact with the fabric of the shirt while pressing. It's permanent and cannot be removed. But it can be avoided with the right production procedures.

The transfer line is caused by several factors coming together at the same time. The first is that the heat of the process makes the shirt more pliable. Then the pressure of the press forces the edges of the paper to dig down into fibers. Because they are soft and pliable, the edge of the paper reshapes the fibers leaving behind a permanent indentation.

To prevent this problem, the pressing process needs to utilize different parameters and some form of padding underneath the shirt to reduce the impact of the paper on the surface.

Heat Press Settings (That I Start With)

Time – 35 seconds

Temperature – 385 F

Pressure – super light

As you can see, these values are pretty far from the norm. Ideally you want the temperature as close to 400 as you can get, the time as close to 60 seconds as you can get, and the pressure much higher. But you have to find the crossover point where the transfer line occurs and stay below it. Experimentation! And this will vary with different brands and styles.

In addition, you will need to use a sheet of high temperature foam to help reduce the impact of the press pressure. This foam is available from sublimation Dealers. Do not use craft foam!

The foam must be cut so that its smaller than the transfer paper, but larger than the image. It can be used many times before it wears out.

Place the foam sheet on the lower platen of the press – by itself. Adjust the pressure so that when the press is fully closed it does not compress the foam by more than ½ of its original height. That will be your final pressure setting.

Layout your shirt on a flat surface. Use a lint roller to remove any microscopic particles leftover from the manufacturing process. This will prevent blue specks from appearing during the pressing process. Roll all surfaces that will be directly under the heat press.

Now place a sheet of Teflon over the foam. Then lay the shirt on top of that. (The foam and Teflon do not go inside the shirt).

Lightly spray the printed side of the transfer with temporary spray adhesive. This will prevent the transfer from moving during pressing and causing ghosting. Line up the transfer sheet on top of the shirt so that it coincides with the edges of the Teflon. Cover everything with a blow-out sheet, typically newsprint or parchment paper.

You are ready to press. If all goes well, you will have a picture-perfect image with no transfer lines when done.

Sublimation On 50/50 Poly-Cotton

This is nothing new. Sublimation will bond to blended shirts, though the colors will not be as bright as with 100% polyester.

There Are Two Basic Rules For Sublimating Blends

1. At least 50% of the blend must be polyester
2. The remaining fabrics must be able to withstand 400 F

With a blend, the more polyester you have, the brighter the color, so with a 50/50 you typically end up with a “washed out” or “retro” look – which can be useful.

Unlike 100% polyester, the first time you wash a blended shirt, you will see a small amount of fading. That’s because some of the sublimation dye temporarily adhered to the cotton during pressing, but gets removed during washing.

Heat Press Settings (That I Start With)

Time – 60 seconds

Temperature – 400 F

Pressure - medium

With blends, it’s rare that you would need to use a sheet of foam, so there are less steps for producing the shirt.

Sublimation On Non-Poly Apparel - Transfers

To be clear, sublimation will not bond to anything but polyesters and polymers. It will not bond to cotton (among other things). However, there are products that will allow you to APPLY sublimation to the surface of a non-poly fabric. In this class we will first look at some transfer products and then as some printable products. For our purposes, we will only be talking sublimating on cotton shirts. Each product has its own set of application parameters, so you will need to research before you buy.

The concept of transfer papers means that all you need to do is choose the right paper and print directly to it with your sublimation printer. Then use the heat press to apply the paper to the shirt. The dye will transfer from the paper along with chemical elements contained in the paper onto the surface of the cotton shirt. Then you simply discard the paper. A whole lot like the standard everyday sublimation process.

It sounds easy enough and it really is. However, all papers are not created equally. Thus, it’s important that you test some different products to see what kind of results you get.

All of the papers utilize some form of polymer that provides a “go-between” link for the sublimation to adhere to the cotton. Essentially the entire sheet is coated when manufactured. When you press

an image the coating releases from the paper with the ink (to bond it). But with some products, the non-printed area coating also transfers to the shirt.

Picture a rectangular sheet of transfer paper with a small logo printed in the center. During pressing that logo transfers as well as all the empty area of the paper. You end up with a printed logo surrounded by a faint off-white rectangular box in the same dimensions as the transfer paper. This is commonly referred to as a “polymer window” and is not desirable.

With these papers, you will need to trim away the excess paper around the printed image, so that nothing but the dye transfers. This can be done with scissors but is not much fun. If you plan to do a lot of sublimation to cotton printing, look into buying a cutter that can be setup to trim away the excess paper automatically. Using a cutter will add some extra steps, but is well worth the effort.

The second type of paper is known as “self-weeding” because the polymer component only transfers where dye is present on the paper. Though it sounds like a better solution, there are some drawbacks with this type of paper as well.

The first is that it utilizes a “wet process” for production, which means you need to print and then quickly press the image. The second issue is that it works best with dark images. Light colors don’t transfer very well and neither do pictures.

In comparison, the other style of paper tends to do quite well with lighter colors, so in reality no one paper is the perfect choice. Thus, you need to take the time to experiment with the papers and the production processes so you can determine what works best for each application.

Sublimation On Non-Poly Apparel - Vinyl

Recently, Siser released a new vinyl product that was designed for sublimation. This makes it possible for a shop to create any color vinyl they need for a job and/or add graphics and images to it. Instead of having dozens of solid color rolls of vinyl hanging on the walls, you could just keep one color on hand – white sublimation vinyl.

Sublimatable vinyl is typically printed using a desktop sublimation printer, which means it is available in sheets as well as rolls. You just feed the sheets in like regular transfer paper and sublimate your images directly to the surface. There are specific color management settings that need to be used and we will discuss that in a few minutes.

Sublimation vinyl is constructed like regular vinyl. It has two layers. The top layer is the true vinyl and receives the printing. The bottom layer is a backing sheet. Once the vinyl has been printed, it is run through a cutter and the finished piece is removed from the backing.

The vinyl is now ready to be applied to the shirt using a heat press. Two things will occur during this process. The first, is that the sublimation ink will be permanently bonded to the vinyl itself. The second is that the vinyl will adhere to the shirt.

Heat Press Settings (Siser Easy Subli)

Time – 15 seconds

Temperature – 311 F

Pressure - medium

Cover the shirt and transfer with an appropriate cover sheet and press.

Vinyl, as opposed to ink transfers, can be applied any color of shirt. The Siser product can also be applied to multiple materials such as cotton, rayon, wool, polyester and more.

The downside is that it's a physical material that is adhered to the garment as opposed to ink which is either embedded into the surface or lightly on the surface.

Sublimation On Non-Poly Apparel – Flock And Twill

Sublimatable Flock and twill materials work similar to vinyl. Sheets are fed into the printer and ink is applied directly to the material. The material is then trimmed to the right size and shape and applied with a heat press. The pressing phase completes the sublimation processing and bonds the material directly to the shirt.

Flock and twill products are ideal for embroidered applique as it allows you to create graphics on the materials that will be sewn to a shirt. This greatly enhances the value of the finished product.

Color Management For Sublimation On Non-Poly Apparel Products

Digital transfer papers have many different characteristics that affect the quality and color of the image. As a result, you need to take those issues into account when using the products.

The key is using color management/printing software that does it for you. For example, the Virtuoso Print Manager (VPM) from Sawgrass has different “profiles” created for different papers. Profiles set up parameters within the printer that control how the dye is delivered to the paper based on the paper characteristics and the dye characteristics. Too much ink means waste and in the case of the wet transfer paper, could cause streaks. Too little ink may lead to images that have dull or incorrect color.

When the correct profile is used the best quality will be achieved. With this in mind, you need to make sure you use the correct settings each and every time. If your software offers specific profiles for specific products (VPM covers many products) then it's simply a matter of choosing the right profile for the job. The software and printer will do the rest.

If you are using a RIP, you will need to experiment to try and find the proper settings for each type of transfer product. If you don't have a RIP or system-specific software, then contact the manufacturer of your sublimation system for advice.

So far, I have used a half dozen products that allow sublimation to be applied to non-poly garments and have found all to be different, but useful. In addition, I'm seeing new products coming out routinely that improve the process and go more directions like sublimating on darks.

Take the time to investigate different products with an open mind. Pay close attention to the instructions for each. And be sure to test the durability of the products by doing wash tests with the finished garments.

So that about does it for the handout. I know it's a lot of information, but it's really only a small part of what we will cover in the actual class.

So, come prepared to learn with plenty of questions. I look forward to working with you.

See you in class!

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