

HOW-TO...

# Improve Prints with Under-Base Gray

BY RAY SMITH

As most printers are aware, printing with under-base gray is not a new technique. It has proven itself as an excellent solution for problem polyester fabric—in particular, the new stretch wicking fabric with its propensity to migrate dye into the ink film.

Though fighting dye migration was the primary reason this product was created, after testing and further examination, decorators have discovered a number of other uses for the under-base that warrant deeper look at this ink.

## **DYE MIGRATION**

Since under-base gray was originally designed to help stop dye migration on problem fabrics, we can't ignore this pow-

erful characteristic. The gray is used as a first down-base to assist low-bleed white with fighting the dye bleed in the ink film. Though low-bleed white products have a component that is designed to fight migration with dye inhibitors or bleaching properties, it is not always enough. There are times where the white will allow migration over time, so an additional strategy is needed.

In contrast to low-bleed whites, the under-base gray's active ingredient is carbon—hence the dark color. The carbon particles act as a filter, or absorbent layer, for the dye as it migrates through the layer. Using the under-base gray in conjunction with the low-bleed white gives the printer

a “one-two punch” when dealing with fabrics that bleed.

To use in this capacity, the under-base gray is printed first onto the shirt through a 110–120 mesh. In a few cases, such as smooth 100 percent polyester jerseys, the ink can be printed with as much as 140 mesh, but many times the lower mesh is needed to cover errant fibers on the surface of the garment. The gray flashes dry quickly at about 180 degrees.

Some printers choose to use a “smoothing screen” at this point, placing a fully exposed smooth screen in the cooling station without an image. The heat from the flash and the pressure from the squeegee will simu-

late a transfer press application, which will smooth the surface of the ink. The second plate is white and subsequent colors are printed on top with meshes ranging from 110–230. Since the fabric is sealed by the gray, many printers have found that the subsequent colors can be printed with very little pressure.

#### **IMPROVE PRODUCTION**

Under-base gray inherently flashes faster, thus the flash time is no longer the limiting factor in the production setting. This characteristic can also enable the operator to lower flash temperatures to a point that a cool station is not necessary.

# Inkjet

**Dark secret revealed ...film positives are critical to pre-press.**

THE ORIGINAL  
All Black Ink Cartridges™ • Inkjet Solutions • AccuRIP Software™

  
**Freehand™**

**Best user experience and  
best-in-class solutions!**

**Download FREE Software Trials**

**[www.softwareforscreenprinters.com](http://www.softwareforscreenprinters.com)**

Inkjets revolutionized the screen print industry and film output.

**AccuRIP Software™** and the **All Black Ink™** cartridge system revolutionized how you produce top-quality films using inkjets.

Stop struggling due to poor work habits, bad information, and the wrong product choices. Succeed by using the proper combo of RIP software, dye ink, and dye film. Achieve off the chart high-density film results that capture detail and deliver optimal screen exposure even with new LED equipment!

## HOW-TO USE UNDER- BASE GRAY



This print has no white under-base beneath the lighter colors as their formula has a good load of white pigment. (Image courtesy Dirt T-Shirts, Kingston, N.Y.)

*In general, final overprint colors such as yellow, bright orange, fluorescent, and middle chip saturated colors will need a white under-base to keep the colors within the correct brightness level.*

*Colors such as red, blue, purple, green, and any dark or dirty colors, will perform better over gray. Surprisingly, many pastel colors do well over a gray under-base because the formula has a high level of white pigment, giving it the opacity necessary to cover the gray completely.*



The under-base gray prints and flashes easily for quick production while maintaining an excellent surface for a variety of colors. (Image courtesy Dirt T-Shirts, Kingston, N.Y.)

Once this layer is flashed, the gray provides an excellent surface for which other colors can print. For instance, the heat retained in the surface will assist with gelling of the subsequent layers, and the remaining colors, including the white, will flash easier and quicker with much less pressure. This in turn results in better ink deposit. Under-base gray also provides a nice neutral color base for most colors. This helps operators choose color matches on-press more easily and quicker, which helps to decrease set up times.

Another advantage to using the gray is that the print will utilize less white, which is traditionally higher cost than the under-base gray. Because the white plate is used only where absolutely needed, and since it is printed on top of the gray, it

can go through a higher mesh with less pressure.

**SURFACE IMPROVEMENT**

There are many new fabrics in the market that provide performance and comfort to the consumer. These fabrics also present new challenges to the printer. The first being the aforementioned issue of dye migration, and the second being brushed or “fuzzy” surfaces designed to feel softer against the skin. These surfaces pose a problem to printers because once the applied ink is cured, the surface can end up feeling rough. Due to its unique properties, the under-base gray will create a smoother surface than conventional ink. The larger particles in the ink act as a coating agent that will seal and lay down the

fibers of the fabric during the application process. This in turn will result in cleaner overprint colors and a smooth hand on the print surface. This aesthetic is achieved with less ink volume than conventional under-base white, and creates a smooth feel with improved drape.

Though some white under-base products do a good job of flattening the fibers of a problematic fabric, many times there is still a “through” look that can distract the eye with an uneven color surface. Many times this look is enhanced because of the high contrast between the shirt fiber color and the white. Since the gray is more mid-tone, it tends to “deaden” the eye to this surface noise and creates a better uniform color upon which colors can be printed.

# WHY SHOP CONDÉ SYSTEMS?

Condé offers everything needed to get into the personalized photo gift business including:

- DYE-SUB TRANSFER SYSTEMS
- DYE-SUB INK, PAPER & SUPPLIES
- HEAT TRANSFER SYSTEMS
- LASER & INK JET TRANSFER PAPERS
- HEAT PRESSES
- BLANK IMPRINTABLE PRODUCTS
- PRODUCTION SOFTWARE
- EDUCATIONAL VIDEOS
- LEGENDARY TECHNICAL SUPPORT



Find out how producing photo quality gifts & awards can help your business be more profitable... call Condé today!



800-826-6332



www.conde.com



## HOW-TO USE UNDER- BASE GRAY

When optimizing prints, many printers will opt for soft squeegees through open meshes to achieve a smooth uniform surface. This technique works well, but the most important aspect in this process is the screen. I advise printers to select their tightest screen for their under-base gray. The screen should then be coated with a two-two technique; two coats outside, two coats inside with extra pressure on the last stroke of the inside of the screen. This pushes the most volume of emulsion to the shirt side of the screen. This coating procedure should yield approximately 15–18 percent emulsion over mesh (EOM).



**Above:** Under-base can improve the brightness of an image as most colors are in the gray brightness range. (Image courtesy Dirt T-Shirts, Kingston, N.Y.) **Right:** Under-base gray provides an additional protective layer of bleed resistance when printed under white and colors. This image shows an under-base gray on the left, and white-flash-white on the right. (Image courtesy Wilflex)

*To set-up the rotation using an under-base gray, the technique would be: Under-base gray - flash - cool - under-base white - colors.*

*The gray base would replace the traditional white under-base plate. The white plate would include only the white areas and the color areas that need a white under-base (such as yellow, fluorescent, etc.) Print the colors on the gray before the colors on the white under-base for less “pick-up” or “peel”.*

*This parameter enhances color, surface, and speed. Some customers enjoy this feature of the gray on their poly and poly-blend garments and some have opted to mix cotton gray for the under-base on 100 percent cotton garments.*



By creating the screen in this manner, the operator can opt for a slightly harder squeegee and less pressure with an increased outward angle. This adjustment will result in better control of the surface and better deposit of the ink.

**COLOR**

Perhaps the most underrated aspect of using gray as an under-base is color control.

Color can be described as the combination of three characteristics: hue, saturation and brightness. Hue is the actual color, which in the screen print industry is controlled by the pigment in the ink. Saturation is the intensity of the color, which is controlled by the amount of color pigment versus base or white pigment. Brightness is controlled by the amount of white pigment

in the ink or the color's relationship with the under-base. Since screen printing inks are not 100 percent opaque, they are definitely influenced by the brightness of the under-base surface.

When measuring color brightness, the majority of color brightness levels are mid-tone levels. Under-base gray can actually bring most colors to their natural brightness levels. To demonstrate, imagine watching a black and white TV. Though you cannot see color, you can see shade differences that make sense. This is a good exercise to show that most colors are in the gray brightness range. So why do we keep using white under-bases for all colors?

Many complaints of "weak color" formulations are the result of printers trying to fight a white under-base with a dark or

mid-tone color overprint. Next time an operator says that a color doesn't have enough opacity, make sure that this is not the case. These colors may need less white to hit their brightness level. If the separation artist keeps this theory in mind when creating separations, the colors on-press will be much easier to hit.

If you've never explored the advantages of printing with an under-base gray, you may want to reconsider. Not only does the gray help with dye migration as it was designed to do, it also helps to overcome issue such as surface aesthetics, hand, and production time, as well as create multi-dimensional colors. Though it takes some work and time to implement all of the procedures that take the most advantage of under-base gray, it is well worth the effort.



# Sweater Smarts

Edwards is a top 25 supplier and trusted leader in logo-ready apparel. Providing quality apparel designed to last and worn by millions of employees daily.

Edwards features:

- > Sizes, style, colors to fit every need
- > In-stock availability and same-day shipping on blanks
- > Custom on-site embroidery with no minimums
- > 90-day return policy without restocking fee
- > Two-day delivery throughout the continental U.S.
- > One order, one warehouse, one invoice



**IMAGE APPAREL MADE EASY**

www.edwardsgarment.com

800-253-9885



**V-NECK FINE GAUGE SWEATER #4070**

1-24	25-144	145+
\$43.59	\$40.74	\$37.90



**QUARTER-ZIP FINE GAUGE SWEATER #4072**

1-24	25-144	145+
\$45.89	\$42.89	\$39.90



**TWISTED KNOT ¾-SLEEVE SWEATER #7057**

1-24	25-144	145+
\$37.38	\$34.94	\$32.50



**OPEN CARDIGAN #7056**

1-24	25-144	145+
\$43.59	\$40.74	\$37.90