

Printing on the Ultra Wash Tee

Use water-based inks to successfully embellish these super-soft tees.

By Rick Davis, Contributing Writer

The advancements in the production of new yarns and knitting techniques are allowing apparel manufacturers to create new fabrics and garment styles that are lighter, yet more durable than ever. One aspect to printing a lighter-weight fabric involves minimizing the ink film's feel on the garment surface.

Conversely, when printing on heavyweight fleece, you can apply heavier ink films, embroidery and appliqués without adversely affecting the garment's feel when being worn. Today's lighter-weight fabrics demand a softer means of graphic embellishment to maintain the garment's feel and drape.

In this installment of the *Impressions* Tech Tips Newsletter, sponsored by American Apparel, we will showcase the ladies' Ultra Wash tee (style RSA6320). This garment includes a 3.8-ounce fabric with 100% ring-spun, combed cotton and a 40-singles thread knit. This fabrication makes for an extremely soft and comfortable garment with excellent drape. The last thing you want to do is to apply a heavy-handed embellishment to deter the original feel of the garment.

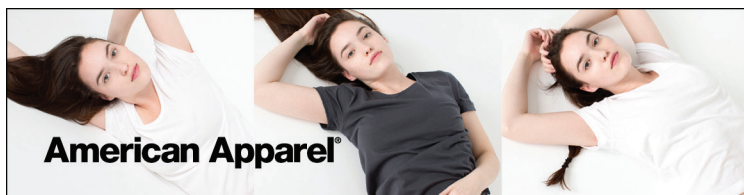
Although we have the option of printing with a soft-hand plastisol ink through fine mesh counts, a dark garment will require a flashed underbase that could negate the feel of the fabric. For this reason, we will print this garment with water-based ink.

WATER-BASED INKS

Most screen printers use plastisol ink for their daily production due to its ease of use and the fact that it will not dry in the screen. But there are a number of different water-based



Style RSA6320, the Ultra Wash tee from American Apparel, is a women's-cut T-shirt featuring a loose fit, scooped neckline and curved bottom hem. It is made of 40-singles, 100% ring-spun combed cotton that is treated in an enzyme wash for a luxuriously soft hand.



**—New
Ultra Wash Tee** Available Now →

products currently on the market that all address different application requirements, including:

- Standard water-based inks for printing a soft hand onto a white or pastel-colored garment
- High-solids-content water-based inks, which maintain a soft hand, for printing on dark backgrounds
- Discharge inks that remove the reactive dyes from the fabric and replace them with the pigment within the ink.

The primary difference between plastisol and water-based inks (with regard to the print's finished hand) is the solids contents within the two respective inks. Water-based ink can possess a 25%-40% solids content, with the remaining percentage being water. Plastisol, on the other hand, contains nearly 100% solids.

The difference in the solids contents between these two ink types accounts for the difference in the hand of the finished print. As 60%-75% of water-based ink is evaporated in the curing process, the finished print's hand is extremely soft. In addition, the post-washed print's hand is even softer and typically not detectable.

Unlike plastisol, water-based ink saturates the fibers of the fabric. Since it's 100% solids, plastisol will encapsulate the fibers but is not absorbed.

PRINTING NOTES

From the standpoint of printing considerations, water-based ink offers some advantages over conventional plastisol. Most water-based inks are lower-viscosity, homogenized emulsions with excellent printing characteristics. In the past, screen mesh options were rather limited, as the water-based inks of old had a nasty tendency to dry in the screen. This would limit the printer to screen mesh counts in the 110 thread-per-inch range.

Today's water-based inks have retarders that deter the ink from drying (as quickly) in the screen and allow you to print through mesh counts as fine as 160 threads per inch. Although these products are far easier to work with than in the past, pre-production testing is suggested to develop the correct procedures to work with these inks if you are unfamiliar.

Unlike printing with plastisol ink, you must penetrate the fabric when working with water-based ink. This requires a softer squeegee compared to that required

—New L/S Ultra Wash Tee

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for printing with plastisols. The objectives are to have a softer squeegee durometer, which also will conform to the surface of the mesh, and to properly transfer the desired ink amount into the fabric's cotton fibers.

Keep in mind that you need to balance your squeegee speed, pressure and angle to ensure the proper ink transfer, as you do not want to saturate the fabric to the point that the ink starts to pass onto the platen. Pressing an excessive amount onto and into the fabric can result in bleeding (loss of definition) on the stencil edges.

The overall goal when printing with water-based inks is to balance the variables between the screen, squeegee, ink and fabric to ensure a proper ink transfer (deposit) into the fabric.

STENCIL CONSIDERATIONS

Traditional plastisol textile screen printers need to consider the selection of photo emulsion that is being used with the water-based ink. Although some standard screen emulsions will have a degree of built-in water resistance, a stencil that can withstand the rigors of both plastisol and water-based applications is preferred. In this case, we used a pure photopolymer emulsion, which is resistant to water- and plastisol-based inks. This eliminates the need to use two photo emulsions.

Many printers like to give their screens a post-exposure hardening in the sun to ensure the stencil is properly exposed. If the screen is properly exposed with the correct exposure type and, preferably, with a light integrator, the post-exposure process should not be

required. For printers in regions where high humidity is common, making proper screen drying a challenge, there are hardening agents that also will combat against any potential screen breakdowns when working with water-based ink.

THE PROCESS

When it comes to alignment, the general process for printing water-based ink basically is the same as that for printing plastisol. The differences lie in actual ink transfer into the fabric. Since the American Apparel ladies Ultra Wash Tee (style RSA6320) has a scoop neck, I set up the art to fall 1 inch from the top of the platen. This will allow for easy garment loading and alignment on a manual or automatic press.

Flooding the screen is given little thought in traditional plastisol printing. However, when printing with water-based ink, it is important to ensure there is a smooth, consistent and even flood across the width of the screen. When printing with plastisol, an inconsistent flood will have little to no effect on the consistency of most prints. With water-based ink, however, an inconsistent ink flood easily can have an adverse effect on the finished print.

Keeping in mind that water-based inks are a completely different animal than traditional plastisol inks, the stroke is somewhat easier. Here, you simply must apply

appropriate pressure and speed to transfer the ink film into the fabric without excessive pressure.

In this example, we are printing the garment with medium-to-light pressure and medium squeegee speed. When printing manually, you can feel the required pressure needed to properly transfer the ink. The screen should be scraped clean and the stencil appropriately cleared of ink once the squeegee stroke is completed. The goal, again, is to ensure the proper ink transfer into the fabric and not force it through the garment with excessive pressure. Doing so will deter the garment's ability to properly cure.

The one critical aspect to properly curing a water-based ink film is to ensure that all of the water contained therein has been evaporated. The difference here is that traditional plastisols will easily cure with radiant (IR) heat, IR/recirculated air or hot forced air. With a water-based ink film, it is best that you at least have recirculated air, which will be needed to drive the water from the ink film. Should the water-based ink film not be properly cured, the result will be poor washability and loss of color intensity.

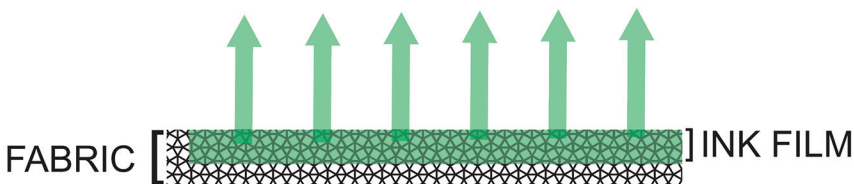
Once cured, the finished garment possesses a vibrant print with a very soft hand. Keep in mind that if you are new to using water-based ink, you always should test prior to printing to ensure you are achieving the desired results.

STEP-BY-STEP

**Special thanks to Atticus Printing, Oviedo, Fla. for the use of their supplies and facility.*



ALL AVAILABLE WATER MUST BE DRIVEN FROM
THE FABRIC TO ENSURE A PROPER CURE



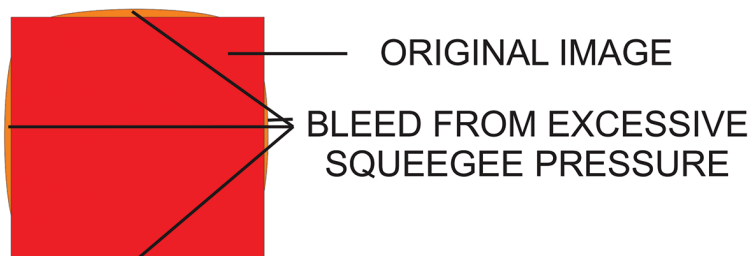
STEP
1

Water-based inks will be used in this example of printing on the American Apparel Ultra Wash tee (style RSA6320).

STEP
2

This graphic shows the saturation of the cotton fibers when printed with water-based ink.

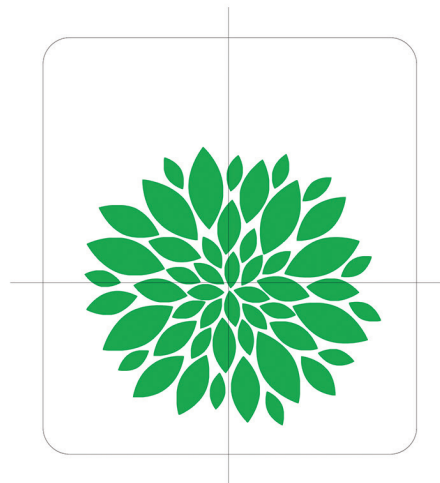
EXCESSIVE SQUEEGEE PRESSURE EFFECTS WITH WATER BASED INKS



STEP
3

This graphic shows the potential bleeding effects caused by excessive squeegee pressure.

GRAPHIC IS PROPERLY ALIGNED FOR EASE OF LOADING ON PRESS



STEP
4

Since the Ultra Wash tee is a scoop-neck style, set up the art for the graphic to fall 1 inch from the top of the platen. This will allow for easy garment loading and alignment.



STEP
5

When printing with water-based ink, it is important to ensure that there is a smooth, consistent and even flood across the width of the screen.



STEP
6

Water-based ink requires appropriate pressure and speed to transfer the ink film into the fabric without excessive pressure.