

Screen Printing on 100% Polyester Mesh

Ensure a proper ink-film thickness and curing parameters for best results on this athletic fabric.

By Rick Davis

Mesh fabrics have been used in the athletic apparel market since the 1940s. Originally, nylon micro mesh was primarily used in making football jerseys. As technology progressed, polyester fibers were used to manufacture similar fabrics at a greatly reduced price while maintaining the same product/fabric performance.

Today, polyester micro mesh is used in a variety of athletic and casual garments, ranging from football jerseys to casual tops and dresses. Embellishment facilities have debated for years when attempting to determine the best way to decorate these garments.

In this *Impressions* Tech Tips Newsletter, we will look at the American Apparel unisex polyester mesh athletic tank (style H458) and T-shirt, and the different means of embellishing these garments. The material is 75 denier and 3.3 ounces per square yard, making it durable and lightweight for any athletic or casual use.

Embellishment procedures have varied over the years in relation to mesh fabrics. From the standpoint of athletic apparel, the typical mindset has been to print a heavier ink film, ensure a proper cure and meet the durability standards needed to withstand the destructive contact sport characteristics and washability requirements needed for such apparel.

Now, with micro mesh being brought into the casual apparel markets, the objective will be to minimize the ink film in order to maintain a softer hand and fabric drape ability. Micro mesh does not have an actual definition; mesh simply is defined as a fabric by its net-like appearance.



H458 Unisex Poly Mesh Athletic Tank

A sporty tank constructed from 3.3 oz/yd² polyester athletic mesh that is lightweight, breathable and quick-drying. It is developed for indoor/outdoor sports, crafted for active lifestyles and formulated for comfort.



Athletic Mesh
American Apparel Wholesale

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As previously mentioned, the image being embellished onto a polyester micro mesh fabric will be dependent on the intended use of that garment. Athletic purposes will require an embellishment capable of withstanding extraordinarily harsh conditions. This will, in turn, dictate a heavier ink film or embellishment. Such applications can fill the holes of the fabric. You can achieve a sufficient ink film to yield opacity, bleed resistance and durability without filling the holes of the mesh.

Casual apparel will demand a softer hand and, thus, the thinnest embellishment possible. When screen printing plastisol ink in such a situation, you will minimize the ink film thickness and, thus, leave the holes of the mesh open. Depending on the printing conditions (which, in this case, require optimization) this can be easier said than done.

We will be reviewing the different means of embellishment for this fabric, which will include traditional screen printing, heat transfer applications and embroidery.

SCREEN PRINTING

First, consider what is required for the fabric being embellished. In this case, we are embellishing a 100% polyester micro mesh garment. Printing on 100% polyester demands that we start with an ink designed for such applications. The ink must have the following characteristics to meet the objectives of printing both casual and athletic apparel:

- bleed resistance
- high opacity
- good flashing characteristics
- good printability for finer mesh applications
- soft hand once cured.

Keeping these parameters in mind, we will address two different printing methodologies. The first will be for printing a soft hand on casual apparel.

When screen printing on casual micro mesh, you must maintain a soft hand, regardless of whether you are using light or dark fabrics. One positive aspect to keep in mind here is that we are printing plastisol ink onto a non-absorbent fabric, which will allow us to use finer mesh counts to achieve our objectives.

Due to the nature of micro mesh, minimize the number of colors printed onto the fabric in an effort to keep the mesh holes free of ink. Should the need arise to print multiple



colors (especially onto a dark fabric), the ink fill still must be minimized. Use the following suggestion as a starting point:

- 140-160 mesh for a white under base
- 230-305 mesh for overlay colors
- 230 mesh for a highlight white, if needed.

The second methodology will be for athletic apparel. As previously mentioned, you must print an ink film that not only will require meeting the durability for football and other sports, but also the industrial wash test that many professional sporting leagues require for their team apparel.

In typical athletic apparel printing situations, you seldom will need to print more than two or three colors. Although some professional teams may require five- to six-color prints for specific logos, typical school printing will be limited to one or two colors in most situations.

As we need to ensure proper bleed resistance in addition to the required durability, most printing parameters will require a print-flash-print sequence using a 110 mesh for the individual colors. Although a 110 mesh was used in this example, coarser or finer mesh counts can be used based on your respective printing conditions.

PROPER CURING PARAMETERS

When printing on any polyester fabric, remember that polyester dyes can potentially sublimate at temperatures exceeding 360°F. As traditional plastisol inks cure at 320°F, take measures to ensure that the temperatures of your flash units, platens and dryer keep the ink film and fabric as close to this temperature as possible. This may

include decreasing your flash settings once the press platens are heated to the 100°F-plus range. This will hold especially true when printing on an automatic screen printing press as opposed to a manual. A non-contact pyrometer is a good means to determine that the ink film does not exceed the required temperatures when exiting the dryer.

HEAT TRANSFERS

Heat transfers have been a primary embellishment method on micro mesh for many years. This especially holds true for athletic sporting apparel, where names and numbers are required. Vinyl transfers have the advantage of easily creating a smooth finish across the fabric surface while easily withstanding the demands that athletic apparel requires.

When embellishing micro mesh garments for a football or basketball team, precut vinyl transfers allow for easy application, as opposed to screen printing, which would require shooting a screen for each garment that requires a specific name. Vinyl transfers will produce a continuous and smooth finish, which will completely cover the fabric's mesh holes.

Sublimation transfers allow for an entirely new application for micro mesh embellishment. This is primarily due

to the fact that it involves printing on 100% polyester fabric. In the sublimation transfer process, the ink film (inkjet) printed onto the transfer paper will sublime into a gas during the transfer process and penetrate into the garment's polyester fibers.

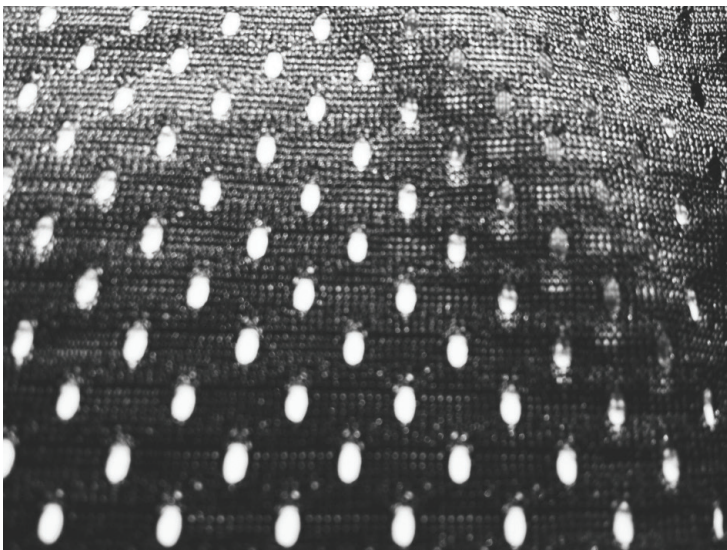
Sublimation transfers will allow for the embellishment of team apparel, but they will only work on white or light-colored backgrounds. The additional advantage of sublimation transfers is the fact that the hand of the print is nonexistent since the print is introduced to the fabric fibers as a gas.

EMBROIDERY/APPLIQUÉS

Micro mesh is a light, soft and relatively thin fabric. From the casual apparel standpoint, standard embroidery is not ideal because of the stiff and harsh hand that the embellishment would create on the fabric. From the standpoint of athleticwear, appliqués often are used for nameplates across the back of a sports jersey, or as a logo or patch applied to the garment.

The American Apparel garments used in this article show the wide range of embellishment options apparel decorators have with this garment. These options will only grow as new fabrics and embellishment methodologies are created moving forward.

STEP-BY-STEP *Printing facilities and materials provided by Reliable Custom Imprints, Longwood, Fla.*



STEP 1 Shown here are the holes woven into the mesh fabric, which give it breathability and make it ideal for an array of sports or casual wear.



STEP 2 The red ink printed onto white here was produced through a 230 mesh, allowing for a minimal ink film and soft hand.



STEP 3 The print shown here is a heavier ink film from a 110-mesh screen with a double pass to ensure opacity and performance



STEP 4 Using a non-contact pyrometer will help you determine proper temperature control when printing heat-sensitive fabrics.



STEP 5 Vinyl transfers offer an easy alternative when printing names and numbers onto micro mesh.



STEP 6 Sublimation transfers allow for small or all-over graphics, allowing for a wide range of sales and marketing opportunities.



STEP 7 Here is a heat-applied appliqué used as a team logo on the bottom of a garment.

Rick Davis is a screen printing veteran with more than 30 years in the industry. His background spans contractor management, plant management, consulting, international sourcing and sales. He is currently the southeast regional sales manager for the Triangle Ink Co. and is a member of the Academy of Screen and Digital Printing Technology. Rick also is a speaker at industry trade shows and a regular contributor to industry trade magazines. For more information or to comment on this article, email Rick at rdavis@triangleink.com.