

Screen Printing on 100% Polyester

Screen printing (also known as silk screening) is a printing technique that uses stencils and ink to create designs on fabric. Although it requires significantly more set-up time than digital printing or heat transfer, screen printing is the most economical method for producing large quantities. Commonly used on cotton or cotton blend apparel, screen printing can be done on 100% polyester using special inks and additives.

SCREEN PRINTING PROCESS

Screen printing on 100% polyester presents two unique challenges.

The first is dye migration – ink discoloration that occurs when exposure to high temperatures causes dye to “migrate” from the garment into the screen print ink. To prevent this problem, use highly opaque ink or print a base layer of a barrier material, and cure at the lowest recommended temperature.

The second challenge is shrinkage. To avoid this, careful handling is essential when applying heat to polyester fabric, which can shrink or burn at high temperatures.



FOR SUCCESSFUL SCREEN PRINTING ON 100% POLYESTER, FOLLOW THESE RECOMMENDATIONS:

- Work with your ink supplier to select the correct ink for your project – usually a one-step nylon ink or an opaque plastisol ink with a nylon hardener. (The hardener will shorten the life of the ink, however, so prepare only as much ink as you will use in an hour of production.)
- When preparing screens, use a high-tension mesh with thin thread. Use consistent off-contact printing (leaving space between the screen and the substrate), which allows a uniform application of ink to the shirt's surface.
- Polyester fabrics tend not to adhere to the pallet as securely as cotton fabrics, therefore be cautious not to shift the garment during printing. Apply ink with a single stroke, which is sufficient to achieve good coverage. In addition, use a direct screen print only if you have a one-color print, or print two colors only if they do not butt up against one another.
- Follow ink manufacturer's directions for curing time and temperature. Generally, polyester garments are cured at temperatures under 320°F. To achieve this, you may need to use a catalyst in your ink to reduce the curing temperature.
- Before going into production, allow a printed shirt to rest overnight and wash it to ensure that you have consistent coverage, good adhesion and no signs of dye migration.

Screen Printing

Screen printing (also known as silk screening) is a printing technique that uses stencils and ink to create designs on fabric. Although it requires significantly more set-up time than digital printing or heat transfer, screen printing remains popular because it is the most economical method for producing large quantities.

SCREEN PRINTING PROCESS

Screen printing has a steep learning curve that requires knowledge of everything from making screens and press set-up to actual printing.



IMAGE DESIGN:

Create a customized graphic using professional graphics software. The graphic must be separated by color, with each color printed on its own clear film positive. Fewer colors mean a simpler set-up, resulting in lower costs.



SCREEN MAKING:

Following a process that requires the use of a darkroom and photographic chemicals, a stencil, known as a screen, is made for each colour in the graphic image.



PRINTING:

Each screen must be inserted and carefully aligned in the printing press to ensure that adjacent colors in the image are correctly aligned. The printing press applies ink to each screen, then uses pressure to squeeze the ink through the screen's open mesh areas and onto the shirt. There are three common types of screen printing presses: flat-bed; cylinder; and rotary, which is the most widely used.

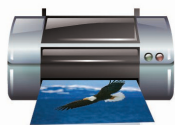


DRYING:

After all colors are printed, the shirt is placed in a drying chamber at around 350°F for about 40 seconds to cure the screen print ink. Once cooled, the shirt is ready to wear.

Dye Sublimation

Dye sublimation is a transfer process that produces a full-color, photo-quality reproduction of a digital image using ink that turns into gas when heat is applied. The gas permeates, or dyes, the substrate – becoming an inherent part of whatever material it's applied to. Dye sublimation is a tremendously versatile technology with applications in apparel, awards, promotional products, signage and much more.



DYE SUBLIMATION PROCESS

IMAGE DESIGN:

Create a customized graphic using professional graphics software. Sublimation images are capable of rendering millions of colors in high resolution to produce photo-quality images as well as vector graphics and text.

PRINTING:

Print your customized graphic to an inkjet printer using sublimation inks on sublimation-compatible paper.

DYEING:

Place the printed image face down on the sublimation-ready surface, such as a 100% polyester T-shirt. You may wish to secure or “tack” the paper to the item with repositionable adhesive spray, found at craft and hardware stores. Place the product and sublimation print under a heat press, following manufacturer directions for temperature and time. (Usually, recommended temperature for T-shirts is around 400° F for about 50 seconds at 30-40 PSI.) Strive to achieve continuous contact between the heated platen and the sublimation transfer. When time is up, use heat protective gloves to remove the transfer. When the item has cooled, it's ready to wear.

DYE SUBLIMATION EQUIPMENT AND SUPPLIES

- **COMPUTER:** A desktop or laptop computer with graphics software such as Adobe Creative Suite. Wide format systems may require RIP software, a printer driver that can be calibrated for color and quality for your specific print set-up.
- **DYE SUBLIMATION-COMPATIBLE INKJET PRINTER AND INK:** Choose from a growing number of dye sublimation printers, many from the same manufacturers that produce home office inkjet printers.
- **HEAT PRESS:** Clamshell or swing-away presses with a platen large enough for apparel items.
- **SUBSTRATE:** Only 100% polyester garments such as the GILDAN PERFORMANCE® 42000 and 42400 T-shirt families are suitable for dye sublimation. White or very light colored garments are also essential, since any background color will affect the appearance of the image.
- **DESIGN:** Generally, high-resolution JPEG art produces the sharpest, most vibrant images.

Foil Printing

Foil printing is a premium process that gives decorated items an attention-getting metallic shimmer. It's a highly effective way to add a bright accent to traditional screen printing or can be applied to large areas for maximum shine and impact. Foil printing involves screen printing a layer of adhesive onto the garment, curing the adhesive, and then using heat and pressure to apply foil. It requires skill, attention and the right materials, but achieves a special look with a high perceived value.



IMAGE DESIGN:

As with screen printing, create a customized graphic using professional graphics software. The graphic must be separated by color, with each color – including the foil portion of the design – printed on its own clear positive film. Foil must be the top-most layer of the design, applied after all other ink has been applied and cured.

SCREEN MAKING:

Using a darkroom and photographic chemicals, make a stencil – known as a screen – made for each ink color and for the foil. For the foil screen, use a mesh with fine thread and high tension.

ADHESIVE APPLICATION:

Carefully position the foil screen in the screen printer. Using a squeegee with a hardness of about 75 shore, apply a 100-micron layer of viscous glue using two print and flood strokes. Angle the flood bar to ensure that the screen is well flooded and that the adhesive is pressed into the surface and not merely floating on top. Too little glue causes poor adhesion; too much will cause the glue to melt from under the foil, resulting in uneven edges. The printed glue should have a smooth, glass-like finish. Flash cure the glue as well as any underlying ink layers. You may also need to print a separation fluid to prevent the foil from adhering to inked areas other than the intended design. Dry time for regular plastisol is a minimum of 90 seconds at 165°C = 330°F. The polymerization of the ink that happens at 330°F after two seconds is usually enough, but we suggest using 90 seconds or more to be sure that the garment is heated up to the required temperature. Many ink suppliers use a temperature of 380°F to ensure that the plastisol is dry. However, that temperature may sometimes cause scorching or burning which could damage the print or fabric. You may print a grey layer of ink under a silver foil and a gold/yellow layer of ink under a golden foil, etc., or dye the glue grey or gold. Doing this means someone will not see that the foil is peeling or falling off of some pin spots after the first washes, and the image will look fresh for longer.

FOIL APPLICATION:

Set your heat transfer press to the foil and ink manufacturers' recommended time, temperature and pressure. Make certain that the hot plate is clean, the rubber pad is in good condition, and that the press applies consistent pressure across the entire surface. Position the item in the heat transfer press, place the foil sheet over the adhesive-printed area and apply heat and pressure. Make several test prints to ensure that the foil is adhering smoothly and completely, and that your design has sharp, even edges.

LONGEVITY AND CARE:

Foil printing is one of the least permanent decorating processes, with a tendency to tarnish or flake after numerous washes. A quality printing job produces in a more durable result, and proper care can substantially increase the life of foil prints. Encourage your customers to turn foil printed items inside out before washing; launder using their washing machine's delicate cycle or hand wash; hang to dry. Also let them know that they should never use an iron on a foil print.

Heat Transfer

glitter and rhinestones

Adding special effects such as glitter and rhinestones lets you create dazzling designs that grab attention for your customers – and your business. You can achieve this form of head-turning decoration using heat transfer, which is ideal for quick turn-around times and small quantities, including one-off items.

HEAT TRANSFER PROCESS

IMAGE DESIGN:

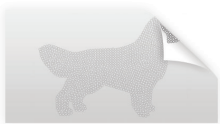
Create a customized graphic using professional graphics software, incorporating any of hundreds of ready-made rhinestone designs, from lettering to licensed sports team logos. When the design is complete, flip it horizontally to create a reverse image. This can also be created with a screen print process and is not limited to digital software. The preparation cost to print a transfer is the same as for a classic screen print (film, screen, ink). The advantage of a transfer is that you can print easily on a manual press, print a few more transfers if you need on stock for later use, and create transfers for specialty garments such as polyester and polyester blends and/or for special positions where a machine cannot work.

TRANSFER IMAGE PREP:

Print your reversed digital image onto transfer paper using an inkjet printer and heat transfer-compatible ink. Transfer images, including graphics utilizing glitter ink, can also be screen printed onto transfer paper. Special heat-resistant, self-adhering rhinestones are available on special transfer paper, ready for application.

PRINTING:

Place your garment on a platen to keep it wrinkle-free, and heat press for three to five seconds to remove moisture and wrinkles. (If combining rhinestones and transfer, use a cover sheet to protect the entire print area, so that ink will not stick to the upper platen.) Remove the rhinestone or glitter transfer from its backing and position carefully on the shirt. Follow manufacturer's application instructions – typically using medium-firm pressure at around 350°F for 10 to 12 seconds for rhinestones, and 15 seconds for glitter.



RHINESTONE & GLITTER HEAT TRANSFER EQUIPMENT & SUPPLIES

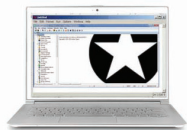
- **Computer with graphics software**, e.g., *Adobe Creative Suite*
- **Heat transfer-compatible inkjet printer, ink and transfer paper; glitter and rhinestone transfer**
- **Heat press**
- **Substrate:** Heat transfer is suitable for cotton, cotton blend and polyester garments. Light colors are preferable, but dark colors can be successfully printed with proper preparation.

Embroidery

Embroidery is the process of turning a graphic or text into a needle-and-thread work of art for application to a garment or other fabric item. Using state-of-the-art software and multi-head industrial sewing machines, embroidered designs can be simple, one-color designs or multi-colored works of intricate detail. Of all the methods of fabric embellishment, embroidery is considered to add the most sophistication and a higher perceived value to a garment.

EMBROIDERY PROCESS:

Today's custom embroidery is a primarily automated process that translates a digital image into data that guides the operation of industrial sewing machines capable of up to 1,500 stitches per minute.



DESIGN AND DIGITIZE IMAGE:

Create or adapt a design for embroidery, bearing in mind that simpler designs with open areas translate best into stitches. Designs with open areas will allow fabric to drape more naturally. Once complete, the design must be digitized to translate it into stitch data for the sewing machine. This may be done in-house using software compatible with your embroidery machine, or outsourced to a reputable digitizing firm. Send the digitized image to your embroidery machine.



STABILIZE AND HOOP:

Select the appropriate stabilizer for your item's fabric, apply temporary spray adhesive, and smooth the stabilizer onto the item. Next, place all layers firmly in your embroidery machine's hoop, which holds the fabric securely and moves as the item is sewn. The fabric should be smooth and flat, but not stretched out of its original shape. Insert the hoop into your embroidery machine.



STITCH THE DESIGN:

Once you insert the hooped item and send your digitized file, the embroidery machine does most of the work. It will stop when it's time to change thread or if other action is needed. When the machine finishes sewing, remove the hoop, unhoop the fabric, and trim any excess thread from the stabilizer. Some items may need a light steam pressing to smooth any creases caused by the hoop.

EMBROIDERY EQUIPMENT AND SUPPLIES

- **COMPUTER:** A computer with specialized software that translates digital imagery, e.g., a GIF or JPEG, into stitch data to guide the embroidery machine, or the services of a digitizing company that will translate the image into stitch data for a fee.
- **EMBROIDERY MACHINE OR SEWING MACHINE:** A wide range of machines are capable of doing embroidery, ranging from low-cost, consumer-grade sewing machines to automated, multi-need industrial machines capable of producing complex, highly detailed stitched graphics.
- **SUBSTRATE:** Many fabric items are suitable for embroidery, from T-shirts and fleece to totes and hats. Very lightweight or highly elastic fabrics can be challenging to embroider, with a greater tendency to pucker or wrinkle. Plush fabric such as fleece require densely stitched embroidery to prevent the fabric from showing between stitches.
- **STABILIZER:** Even low-end home embroidery machines can make several hundred stitches per minute, putting tremendous strain on most fabrics. A stabilizer supports the fabric during stitching to prevent shifting, stretching or distortion.

Direct To Garment

Direct to garment printing (DTG) is printing on textiles using inkjet technology which usually utilizes specialized water-based inks. Most systems are CMYK however there are exceptions like the Kornit DTG Hexachrome system. DTG is particularly effective for short runs, full color printing, or for reproducing fine detail.

PROCESS:

STEP 1: PREPARING THE GARMENT

DTG usually requires a pre-treatment solution to be applied to the garment before the ink can be printed on it. This solution is a “primer” that is designed to create a bond between the ink and the garment. All dark colored garments require this process but it is optional on light colored garments. Depending on the equipment, the pre-treatment may be applied by the DTG printer or it may have to be applied beforehand in a separate process.

STEP 2: PRINTING

The shirt is placed on a platen that keeps it flat and smooth during printing. It is essential that the shirt is flat as possible or the print heads will move away from the substrate and the printing can become blurry. The artwork is loaded into specialised RIP software (rasterized) and is sent to the printer. For light garments the machine makes a pass over the garment surface, while applying a highly controlled spray of each of the process inks. This may be one or multiple passes. For dark garments it first lays down a white underbase and then returns to print the process inks.

STEP 3: CURING

Once the image is printed on the shirt, the ink needs to be cured in order to make the image permanent. This heat may be applied in a conveyor oven (dryer), a special drawer-based cabinet oven (dryer), or using a heat press. The length of time and amount of heat are dependent on the exact ink system, and the thickness of the ink. As with all types of inks on all garments/fabrics the atmospheric conditions or the temperature or humidity in the garment may also affect the cure.

TIPS

1. DTG is less complicated than traditional screen printing. Compared to screenprinting, DTG requires less experience and specialised knowledge, it is simpler with many less steps, it uses fewer chemicals, and it takes up less floor space.
2. 100% Ring Spun cotton fabrics garments are the easiest substrate for good results with DTG since they have a smooth print surface. Many blended fabrics also work but they can be more difficult. 100% polyester previously was not able to be printed DTG but now advanced equipment and ink sets are available which get superior results, even on polyester.
3. DTG is a great solution for print-on-demand, on-line stores, and for individual special projects. It allows for single pieces or short runs to be affordable or when there is particularly fine detail.
4. A high resolution is best for artwork. 300 dpi at full size is the minimum resolution for the best results. Artwork with an inferior resolution will not give ideal results but with DTG you may get passable results that are superior to screenprinting from such files.
5. For the highest level of quality always pre-test the exact garment you are going to print. Different garments in terms of color, fabric, and means of manufacture require different DTG printing parameters. Garments of the same color and style but from even a different factory (for example a different country of origin) may require different printing parameters and therefore should be retested.
6. Heat pressing the garment before printing can give superior results as a nice flat surface is the best printing surface.
7. The Gildan® 64000 and 64000L get superior DTG results due to the 100% ring spun cotton, consistency of manufacture, and the tight knit of the fabric. Halftone dots reproduce better and you also get a nice even print on broad areas of color with the smooth fabric of Gildan Softstyle® shirts.