

Preparing Art Files for Digital Printing

Any great print starts with the artwork. The first step a decorator must take when getting into the business of imprinting apparel is figuring out where the artwork will come from and the proper procedures for converting that art into a format that can be used by the chosen output device.

In this article, we will focus on digital methods of printing. Digital is defined as a process requiring a computer and a printer or cutter as the output device. Digital is ideal for quantities as low as one. With no setup costs involved, except for the additional ink and paper, the overhead is roughly the same to print one piece or 1,000 pieces. With digital printing, the artwork is sent to the printer and then is either directly printed to a garment or to transfer paper where it is then heat sealed to the shirt. The processes covered will include:

- **Digital Transfer (sublimation, inkjet and color laser printer)**

This is an indirect printing technique. The device prints ink or toner onto a carrier paper to create a transfer. The transfer is then placed on the garment and sealed using a heat press.

- **Digital Direct-to-Garment (DTG)**

This is an inkjet device that prints ink directly onto the garment. Dark garments must be pretreated prior to printing, which is an additional process step, then the print must be cured using a conveyor dryer or heat press.

- **Vinyl Cutting**

This is an indirect printing technique that requires a cutter. You insert a roll or sheets of vinyl, and a blade cuts out shapes that then have to be weeded and heat applied using a heat press.

- **Printer/Cutter**

This type of equipment marries an inkjet printer with a vinyl cutter. You insert a roll of white media. A design



It is possible to purchase stock art that is ready for cutting. This way you do not have to spend any time designing or preparing a file in the proper format. Photo courtesy of Great Dane Graphics.



By Dane Clement, President, Great Dane Graphics



Desktop dye-sublimation printers are loaded with paper sheets and use special liquid ink with sublimation dyes that are used to create the image. Photo courtesy of Condé.



Weeding makes vinyl cutting more labor intensive than digital direct-to-garment printing or digital transfers. Once the vinyl is cut, the excess must be removed before applying the graphic to a substrate. Photo courtesy of Stahl's.



Dye-sublimation transfers are a versatile digital decorating process that allows for vibrant color that will never crack, peel or fade. However, they can be used only on white and light colored garments. Photo courtesy of Great Dane Graphics.

is printed onto the material and then the media is rolled back and each design is contour cut. Designs are weeded and then applied with a heat press machine. It also can be used with pressure-sensitive and sign media for creating decals, wall graphics and other signage products.

Digital Transfers

Digital transfers are created using either an inkjet or color laser desktop printer. This is the exact same type of machine you use to print paper; however, you buy special inks or toners and specialty papers that allow the printed images to be transferred to a garment using a heat press.

In comparison to screen printing, preparing artwork files and production are much simpler. There are no separations, screen prep or screen exposure because you do not need to make screens. While screen printing increases in cost with every screen you make, with digital, the number of colors has no effect on cost so your choices are unlimited.

When the inkjet or toner head lays down the dots, they are smaller than when using screen printing mesh, so it's possible to get much finer detail. You may spend the same amount of time creating the design, but once that's done, there's much less overhead than screen printing and that makes creating even a single piece profitable.

There are three types of colorants used to make digital transfers for desktop printers. Inkjet printers use liquid ink; color laser transfers use toner, which is in powder form; and sublimation uses liquid sublimation dye. All three come packaged in cartridges that are loaded into the printer.

To print a digital transfer on a dark shirt without having to cut and weed, you must have a color laser printer that offers white toner capabilities. (I don't know of any inkjet printers with white ink that print transfers on paper — typically it's laser with white toner). When you prepare the artwork, you need to mirror the image and choose the white toner option; the printer puts down a white layer after printing all the colors. So if you want to offer designs on dark garments, be sure you are using a printer with white toner capacity.

You have to tell the printer that the design is for a dark color, and the art needs to be created on a transparent background. When this is done, the RIP or printer driver of your digital printer will automatically generate the white underbase.

The one exception is sublimation. This process cannot be done on dark colors:

It will either not show up at all or be significantly muted. Because sublimation inks literally bond with polyester fabric fibers, there is no way to put a layer of white on top of the garment for laying down inks. So all sublimation printing has to be done on white or light pastels with a high polyester content to be successful.

Raster art is recommended for digital printing. While vector art can be used, designs with large solid areas, which are common with vector art, are not recommended. They create too many uncontrollable issues. If the printheads get clogged or toner is low, streaking can result and is much more evident in a design with solid areas.

Since raster art is usually more of a continuous tone image of a photo or illustration, streaking can be camouflaged more easily. So most of the same rules apply here as for screen printing. You can create artwork in Photoshop or CorelDRAW PHOTO-PAINT. You can scan or photograph original artwork or use a photo. I recommend using the RGB color mode instead of CMYK.

The recommended size and resolution for digital artwork is the same as screen printing. Ideally artwork is prepared no smaller than 300 dots per inch at 14 x 14 inches. That is considered a high-res file. It is easy to make artwork smaller, but a low-resolution design cannot be made bigger.

Digital Design Tips

Anytime you create artwork for a transfer, you need to create it as a mirror image. If you don't, your type will read backwards when applied to the garment. Another tip is to avoid halftones or faded areas. The dots need to have enough substance to release from the paper and transfer correctly to the garment.

If you fade a design to nothing, the dots are spread so far apart and are so small, they have nothing to hang on to and will just fall off. Soft drop shadows with lettering also do not work well. Stick to designs with solid edges. You can, for example, do intricate designs with lots of holes or openings.

As mentioned previously, another general rule of thumb is to avoid designing anything with a solid flat area of color. A big block letter for a spiritwear shirt is a good example. Sometimes, you'll get banding or streaking when using an inkjet or toner drum. If you print a solid area, the streaking can be very obvious.

However, if your design has a lot of detail — such as a forest with flowers, trees and birds — the streaking may not



This is an example of vector artwork. It is ideal for logos, text, borders, and shapes without a lot of jagged edges. It is the format needed for vinyl cutting or spot-color screen printing. Graphic courtesy of Great Dane Graphics.



When using a DTG printer, you want to avoid designing large blocks of color like a spiritwear letter. Sometimes, DTG printing will streak or show banding, and this is very obvious in a solid area. If the design has a lot of detail, it makes streaking less noticeable. Photo courtesy of Brother.



This is an example of a raster artwork. To create it within a graphic software program, you need either Adobe Photoshop (PSD), or Corel PHOTO-PAINT (CPT). Graphic courtesy of Great Dane Graphics.



There are tricks that can be used when designing a vinyl-cut design to make weeding easier. By including little "connectors" from one part of the design to another, you can sometimes pull away the excess vinyl in one motion. Photo courtesy of Stahls.



Using heat transfer vinyl and a cutter, it is a simple process to cut and weed a design that can be applied to a cap with a heat press. Photo courtesy of Stahls.

be noticeable. It's essentially employing a trick of the eye, but a good guideline to follow if you want to avoid redoing jobs.

Another common goof when designing a transfer is to have a solid-color border around the entire outside edge of the image or have the design itself in a rectangular shape. To avoid this, I recommend erasing edges or background areas so that the perimeter of the design is more free flowing. Have elements of the layout flow in and out of the design, creating a more varied outer edge. This also helps to reduce the hand of the print.

Many printer manufacturers offer color profiles for specific models of their equipment. If you are concerned about achieving an exact shade, then you may want to find out if color profiles are available for your equipment and learn how to use them. It will help, but it still isn't perfect. Color reproduction on garments is not an exact science.

Preparing Art Files for Vinyl Cutting

There is a wide range of products available for use with a vinyl cutter, and this process can be applied to the widest range of materials including hard-to-print substrates like nylon, polyester and leather.

There are also some brands of heat-applied graphic materials that can be cut with a laser. If you have a laser and want to use it for vinyl cutting, be sure to choose materials that have been approved for this purpose.

Vinyl and film materials are cut one at a time and heat applied. Some materials can be layered for a multicolor look, but in general, you would not want to layer more than three to avoid having a heavy hand. Keep this in mind when designing.

In most cases, the artwork is kept simple using mostly lettering and shapes such as logos and mascots. Vector is the file format required to do vinyl cutting. As mentioned, you will be using vector graphics software such as CorelDRAW and Adobe Illustrator or a lesser-known hobby-level graphics program.

If you are purchasing stock designs to use for vinyl cutting, make sure the designs you want are available in a vector format and are preferably weed friendly.

Vinyl Cutting Art Tips

Unique to vinyl cutting is the need to weed or remove excess material after it's been cut. This can be a labor-intensive procedure if you do not take care when creating the design.

Ideally, you want to avoid having to pick out tiny circles in the middle of an "O" or hole. You either want to avoid having a lot of cavities to pick out or restrict yourself to large cavities that can be grabbed and pulled out quickly.

You also want to make sure that your line weights are fairly thick because if the line weights are long and thin, they don't stay on a carrier sheet. They start curling up, and you've got to keep pressing them back down so they will stick to the transfer sheet until you are ready to heat apply. Avoid using a line that is less than 1/16 of an inch (0.062).

There are tricks to designing art in such a way that you can weed an entire design in one or two pulls. For example, instead of having two cavities next to each other completely separate, use a small connector, or small opening in the line that divides the two sections. It will not be that noticeable when you look at it, but when you are removing the first cavity, it also will pull up the second one.

Even though each color in vinyl printing cuts separately, you can include all colors of the design in the same file. For example, if the design has a brown football and the words "Turner High School" in green and you use Adobe Illustrator, I find it easier to create one "art board" for each.

Then, when you start production, you send the file to the cutter and it will cut the football. Replace the brown roll with the green roll, and you can then cut the second color.

You also want designs to cut in one continuous outline. This requires that you "weld" (CorelDRAW term) or "unite" (Illustrator term) the separate elements. So if your design incorporates a circle that overlaps a square, if you weld the two together, it cuts as one piece, it weeds as one piece and applies as one piece. If you do not

weld, you will end up with multiple pieces when you weed.

When decorating garments, no matter what process you are using, there are always unique variables that have to be taken into consideration. For this reason, when you are first getting started, there will always be some trial and error as you figure out how your equipment works, the difference between brands of products and materials, and your own personal preferences in terms of workflow and layout. That said, this overview has given you a head start on how art files need to be prepared to help you avoid some of the most common beginner mistakes.

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Heat-applied vinyl offers significant time savings over screen printing or embroidery. It's also ideal for small quantities. This process requires a vector file. Photo courtesy of Stahls.

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An advertisement for AccuRIP Black Pearl Software and Separation Studio. The background is a dark, moody image of a steampunk character with a large, ornate headpiece and mechanical components. The character has long, dark hair and is looking towards the viewer. The text "AccuRIP Black Pearl" is prominently displayed in a large, white, serif font. Below it, "SOFTWARE" is written in a smaller, white, sans-serif font. To the right, a smaller text block reads: "FREE version 5 upgrade for current Black Pearl Users. Discount for older version users." In the center, "SPOT PROCESS Separation Studio" is written in a large, white, serif font. The Freehand logo, a stylized 'F' inside a square, is in the bottom right corner, with the word "Freehand" written below it.