

## The Low-Down on Art Programs

*A primer for working with **vector**- and **raster**-based graphics programs.*

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MARCH 01, 2005 -- Undeniably, top-notch graphics are what make the difference between good screen printing and great screen printing. The graphics programs used in our industry are divided into two general categories, vector illustration programs (Adobe Illustrator, CorelDRAW and Macromedia Freehand, etc.) and raster, or bitmap, programs such as Adobe Photoshop and Corel Photo Paint. It's sometimes necessary to import and export files between these two programs but, before you can do that, you must understand the differences. Here's the scoop:

Vector-based programs are mainly used for spot-color separations for the bread-and-butter orders in our industry — typefaces, solid-colored graphics and clip-art images. The program identifies the math coordinates (or vectors) between point A and point B and the image is made up of connected lines.

Raster-based programs are designed for high-end, photorealistic work on light or dark shirts because they are image editors dealing with continuous-tone images. These images are only used for process color work. The program treats images as small pixels (or dots) of color that are connected and can be used to tweak, enhance and lighten photos. Bitmap images are created by scanning artwork or digital photographs, or by "painting" with a photo editing or paint program such as Corel PhotoPaint or Adobe PhotoShop.

Unlike vector images, the quality of a raster image is directly related to the image's resolution or number of pixels. Vector images, on the other hand, are created by mathematical equations, so pixels don't impact the image. As a result, they can be scaled up or down in size without loss of quality (Figures 1 and 2).

### TRANSFER TIPS

So why should you transfer files from program to program? Artwork used in the screen printing industry lives in two different worlds and sometimes there's a need to marry the two.

The best way to explain this is by example. In a typical work day, an artist might create artwork or paintings in Photoshop or Painter (using the raster image editing program) and then separate that design. If he needs to add any logos or text, he should import the separation data file into a vector program to ensure that the output films are printed with crisp, clean edges.

The raster images, our "painting," must be printed with halftone dots, which will then be applied to the entire image printed on T-shirts. If you imported vector text into the raster program and then printed the films (rather than vice versa as noted above), the

vector text would appear to have rough edges. This happens because the halftone is applied to the entire file.

The trick to transferring vector artwork between programs is selecting a file format that preserves the integrity of the original graphic including colors (spot or process), trapping, fonts and halftones or gradient fills. Although an Adobe PDF file (portable document format — .pdf) is a good choice for transferring into a different graphics program, properly creating the file requires Adobe Acrobat or CorelDRAW version 10, 11 or 12. That's because the PDF creation function in Adobe's Illustrator, PhotoShop or Freehand programs doesn't allow the user control over the image's technical attributes.

Conversely, the EPS (encapsulated postscript — .eps) file format does allow control of the image's technical attributes because it can contain both bitmap and vector data, handle spot or process colors, maintain font integrity and preserve trapping, halftones and gradient fills. EPS files are generic in nature and aren't sensitive to version numbers because they're not tied to a specific program. They are compatible with both Windows and Macintosh formats.

### Critical Factors

Now that you've chosen to work with the EPS file format, three technical attributes must be controlled when creating the file in Illustrator, CorelDRAW or Freehand: 1. creating bitmap previews, 2. converting text to curves, 3. and using file extensions and version compatibility.

1. Previews are important so you can "see" the file in an import window. Most EPS files have both mathematical vector data and a bitmap preview embedded into the file. This preview exists solely so the user can view the file in an import window and doesn't impact vector graphic quality.

When saving an EPS file in CorelDRAW, you can adjust the preview's resolution (dots per inch, or dpi). Many users increase the preview size to 300 dpi or greater, resulting in a huge file with a correspondingly big bitmap preview. Doing so is unnecessary since vector graphics don't rely on resolution for quality. If they're not being output, there's no reason for such a big image preview.

So a 72 dpi Windows- or Macintosh-compatible preview is generally preferred when using CorelDRAW. An EPS file created in a consumer graphics program will generate only the bitmap header portion of the EPS file and will always import as bitmaps.

2. Converting text to curves is standard procedure for transferring files. Text in a vector graphic is composed of editable fonts. If the person you are working with receives a file but not the fonts, he'll have no way to accurately reproduce the graphic. In a worst-case scenario, he could substitute an incorrect font. Converting all the text to curves prevents this by rendering the text uneditable as a font.

Most professional graphics programs give you this option during the export process. Both CoreIDRAW and Adobe Illustrator let you manually convert text to curves by selecting your object and choosing the "Convert to Curves" or "Convert to Outlines" command. It's essential that you save a copy of any graphic you convert to curves in the event that you need to edit the text at a later date (Figure 3).

3. When it's time to name the file, the .eps extension offers the widest level of compatibility with most professional graphics programs. To do so, save the file as an EPS or export it as such – don't just type those three letters at the end of the file name. The file makeup must be an encapsulated postscript, which entails more than just changing the name (Figure 4).

### Extension Tension

Stay with us here... The export function in any version of CoreIDRAW and the save function in any version of Illustrator or Freehand will create a fully editable EPS file with the extension .eps. The save command in Adobe Illustrator will let you save an Illustrator file with an .ai extension or an .eps extension (Figure 5).

Illustrator will also let you make EPS files compatible with older versions of the same program. Adobe Illustrator version 6 is a good choice — version 5 or lower may distort gradients and blends when imported into some graphics programs.

But when created in a consumer graphics program, the .eps file extension on the end of an EPS file does not ensure that the file is vector based. The only way to tell if an EPS file contains vector data is to open it in a graphics program and preview the artwork; you're just looking for the outlines the file contains. Once open, it will display the vector lines in the image as opposed to pixels for a bitmap.

To better understand this, let's look at an example of a national advertising icon: If the file contains a flat logo that says PEPSI and was opened in "normal" view, it would appear filled with the company's traditional red and blue colors. But if you went to the "artwork only" or "outline" preview, you would see just the black outline that makes up the logo.

Properly importing and exporting EPS files should eliminate most file compatibility issues associated with transferring files electronically from one graphics program to another. It's still a good idea to include a PDF proof as an insurance policy, but most graphics professionals will have no trouble importing and editing Illustrator EPS files if they are properly exported.