Delta Graphics

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Vector vs. Raster

VECTOR

Vector graphics are the most universal format for almost any printing process. Adobe Illustrator is the standard program for creating vector graphics. Vector graphics are not resolution dependent: vector paths are based on mathematical algorithms, so no matter how large you use the graphic, the curves will be smooth and will not change in quality.

The image below on the left shows the graphic as it will appear digitally or printed. This graphic can be enlarged or reduced with no change in quality other than the limitations of the process in which the graphic is being reproduced by. The image below on the right shows the "vector" paths which make up the graphic itself.

Vector Graphic Vector Outlines

Vector graphics can be saved as pdf files, Adobe Illustrator files (.ai), EPS - Encapsulated Post Script (.eps) or Scalable Vector Graphic (.svg) formats for placement into other programs or for use on their own. Programs such as Illustrator can also export raster images if needed: jpeg, tiff, gif or png. The format that you select in the "save as" dialogue box helps determine how your picture will look when output.

Converting a font to "path/outline/curve"

When you create something on the computer and assign a font, what you see on the screen is what it looks like for you... but if you send that same file to someone else and they do not have that particular font installed on their system, then the computer will substitute a generic font for your original font, and it will completely change the way the font appears and prints. Converting fonts to outline allows the computer to read it as a graphic object rather than as just text.

your font as you see it on your computer

how it may appear on another computer, without your font

A very pretty special

Once outlined, the font will now become a vector-based graphic

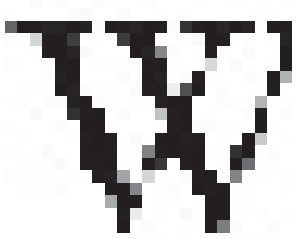
note the vectors that make up the text:

RASTER

Raster graphics are made up of tiny squares referred to as pixels (the dots in "dots per inch") and are resolution dependent. This means that the quality of the image is affected by the resolution of the original and the size that it's used. Resizing of the graphic will change the quality. Raster images include photographs and scans. Raster graphics, when used at the proper dpi, can be used for standard printing but are generally reserved for web use.

The image below on the left shows the graphic in the correct resolution to be displayed on a computer monitor: 72 dpi (dots per inch). Printing on a press requires a minimum resolution of 300 dpi when used at 100% of size. This graphic can be reduced – which will increase the dpi – but it cannot be enlarged without reducing the quality of the graphic. The image below on the right shows the 72 dpi image enlarged – you can see the edges of the graphic start to become jagged.

Raster Graphic
72 dpi at 100% of size



Enlarged View

Raster images and graphics usually cannot be color separated except in four-color process, and must be edited in a program such as Photoshop.

Raster art can be saved in a variety of formats - JPEG (.jpg) is probably the most common. JPEGs are files that have used a compression method to keep the size of the file down. For print media, use a maximum or high setting. Raster art can also be saved as a tiff (.tif) or PNG (.png), or EPS* (.eps) file. Raster images for the web are usually saved as gifs (.gif) or highly compressed jpegs (.jpg).

Raster images can be used in RGB, CMYK or Grayscale color modes, be sure to save yours in the correct color space.

*** NOTE: If a raster image is saved as an .eps or .pdf file, it is still a raster image and not a vector image.**

Why won't Web Graphics work in print?

- Most web graphics are very low resolution, usually 72 dpi. Resizing the graphics can cause it to become blurry or pixilated. In general, graphics created for the web do not have the quality needed to reproduce well in print.
- Color separation is often a problem... web graphics use an Indexed color or an RGB color space instead of the CMYK color space needed to print. It may be costly to convert the graphic if spot colors are desired.

What is "Resolution?"

Resolution refers to the dpi (dots per inch) or ppi (pixels per inch) that you use to create or scan a graphic and the "resolution" at which your job will be imaged. DPI is just what it sounds like - it means the number of dots (or pixels) per square inch.

Anything that you print, whether on your laser printer or a high-end imagesetter, is made up of a this series of dots (pixels). Ever wonder why your type and images look so much better when you have film output than what you ran on your laser printer? It is because most laser printers are 300 to 600 dpi as opposed to the 2400 or more dpi on an imagesetter. Since the output is made up of more dots per square inch on the imagesetter, you have smoother lines because the dots are closer together. This is called "output resolution."

Now for your "input resolution"... there is a rule of thumb for graphics that you scan or create in Photoshop or a similar program that are resolution-dependent (raster images). For high-quality raster art graphics, you must have resolution at least equal to one and one-half times the line screen when using at 100% of size.

For example, if you are printing out a job at 150 Line Screen, then you need at least 225 dpi input resolution on your graphics to ensure high quality printing, or if you are printing at 100 line screen you would need at least 150 dpi input resolution.

If you plan on resizing your graphics in another program, you will need to make sure that your "effective resolution" will support it. Effective resolution is the dpi that you get when resizing a graphic. As the size goes up in a raster image, the resolution goes down (or as the size goes down the resolution goes up). If your original graphic is 4" wide at 300 dpi, and you placed it in your program and enlarge it to 6" wide, you have cut your effective resolution in half to 150 dpi or if you resize it to 2" wide, you have raised your effective resolution to 450 dpi.

What's Line Screen?

Line screen (lpi) deals with a different type of dot than resolution. It refers to "halftone dot" - a pattern of very small black dots that simulate the different shades of gray.

All printed photographic images or screened colors are made up of halftone dot. The lower the line screen the more prominent the dots. That is because line screen means the number of halftone dots per square inch that make up the image.

The rosette pattern you see in cmyk images is a result of the screen angles that the job was printed on. Since all images are made up of dots, you have to print the inks on top of each other. When you try to exactly line up four different sets of dots, you will usually get a moiré (an unwanted "pattern" that appears in photos when the screen angles are not correct), so each color is output at a different angle (generally a change of about 15 degrees for each color) to form the more visually pleasing rosette pattern.

So why not print everything at 200 line screen to make it look better? Different types of papers and presses can only handle certain line screens. For example, a newspaper is printed on an uncoated paper that absorbs a lot of ink and cannot handle a line screen higher than 85 or 100 without plugging (plugging is when the ink fills in the space between the halftone dots). If you look at a magazine, it is probably printed on something like 80# gloss text (the weight and covering of the paper) which absorbs less ink, printing a cleaner dot that won't plug as easily allowing you to print at a higher line screen.

If you ever have any doubt about what line screen to use on your job, check with the shop that will be printing it.