

# Technical Notes

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## Digital File Formats

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### **Vector, or Object-Oriented**

Vector files are a collection of geometric shapes - lines, vectors, and color information, or fills. Graphics created using most drawing software packages are vector, or object-oriented, files. The advantage of vector images is that they can be modified easily, use very little computer memory, and the resolution is determined by the output device-the image is literally drawn according to instructions. Vector images have their disadvantages as well. Vector files don't handle photographic detail very well, and they are often difficult to exchange across computer platforms. Also, complex vector files can require a lot of computer processing power to render the image.

### **Raster, or Bitmapped**

Raster files are used to depict continuous-tone (photographic), gray scale images. Images captured by a scanner, manipulated in image editing software or created in paint software are usually raster, or bitmapped, files. Raster images are described pixel by pixel and contain value information, in bits, for individual pixels. The number of bits per pixel is called bit depth. Raster file formats have many advantages. They maintain the fidelity of photographic originals very well, they require less processing time, and often they can be easily exchanged or converted to other raster file formats. A vector image can be converted to a raster image. Converting a raster image to a vector image, however, is nearly impossible. Raster images are not easily edited and require a lot of computer memory. Rasterization as performed by a RIP (raster image processor), converts a file into the actual dots that will appear on fill or plate.

### **Application/Native Files**

Application files are the native format of the application that created them. The majority of files delivered to pre-press service providers are application files. Application, or native, files are easily edited using the same software application that created the file. This ease of editing, however, may lead to inadvertent errors as the file moves through the production process. Another drawback of moving application files from one workstation to another is that it is difficult to duplicate the environment in which the file was created. Recipients of the file must have the same version of software as the originator. Also, if an application file is opened on a workstation without the same combination of fonts, plug-ins or additions used to create the file, problems are sure to arise.

### **EPS (Encapsulated PostScript)**

A common variant of PostScript, encapsulated PostScript (EPS) is a limited implementation of PostScript that allows users to exchange individual graphics and individual pages while maintaining the integrity of the files contents.

### **TIFF**

The tagged image file format (TIFF) is probably the most common format for the exchange of graphic, bitmapped files. TIFF files consist of two primary components: graphic data and tag information. The graphic data can consist of graphics in one of several possible formats. It is the tag information that describes the make-up of the graphic data to your software and makes TIFF such an excellent choice for file exchange.

### **TIFF/IT and TIFF/IT P1**

Because the TIFF format allows for such a great degree of flexibility. It is not necessarily an ideal format for graphic arts applications. ISO 126399 provides a variant of TIFF called the tag image file format for image technology (TIFF/IT) TIFF/IT allows for the exchange of CEPS (proprietary, high end graphic arts workstation) file formats. The TIFF/IT standard limits variability and its allowable graphic data formats are not easily editable. This format is very suitable for exchange of final files and delivery to printers, however, few desktop applications support TIFF/IT. A variant of TIFF/IT is TIFF/IT P1 (Profile 1) commonly used for transferring high quality composite color images from pre-press shops to the printer for plate making without the need to RIP the file at the target site.

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## DCS

Desktop color separation (DCS) files are used for four-color pre-separated images and include five image components: the cyan, magenta, yellow and black separation images and a low-resolution, composite placement image. The main problem with this five-file format is that it is loosely defined and many vendors have developed their own flavor of it. This has been compounded by the introduction of DCS 2.0, which has expanded the specification of this format and, consequently, increased the probability of output glitches. Also as production workflow now favors composite images it is likely that the usefulness of the DCS format will start to dwindle.

## PDF PORTABLE DOCUMENT FORMAT

Software applications now allow users to convert a file into portable document format (PDF). This format is a variation of PostScript and employs an object-oriented structural design that incorporates vector, raster, and text elements as objects and provides increased portability between computer platforms. The PDF format gained popularity quickly because of its ability to allow users to view a full formatted document on multiple operating system without the need to have the creation application and fonts of the user's system. Moreover, a PDF file can be printed on many output devices. A PDF file describes the relationship of elements to one another in a device- and resolution- independent manner. When converted to PDF, a file is smaller, nearly uneditable and very transportable. The first step in creating a PDF file actually involves writing the file as Postscript. Next, The Postscript file is distilled, or "normalized," to create the PDF file. This normalization step greatly reduces the chance for errors when PDF file is RIPed to an output device. Using an Accredited format such as PDF/X1a will increase predictability and is thus preferable to the generic PDF format. It cannot be stressed strongly enough that the use of applications that do not natively process PDF be carefully evaluated to ensure that all the functions included in the originator's files can be correctly reproduced in the recipient's workflow.

## POSTSCRIPT FILES

In most drawing, paint, image-editing and page-layout application when the operator selects "Save", the file is written to a storage medium (hard drive, floppy disk, etc.) as a file in native format. If the operator selects "Print" and chooses destination printer, the file is written across a network to an output device. If the operator selects "Print", however, and chooses destination "File", the digital information is written to disk in PostScript code. Two very different files result from two seemingly similar actions. The major difference is the actual format of the data that is created.

## PostScript is Not Considered a File Format

PostScript was the revolutionary technology that enabled electronic publishing to move from proprietary systems to the current environment of open systems, it is the de facto computer language standard in electronic publishing. The graphic arts industry has spent over a decade developing tools and procedures to make PostScript work in electronic pre-press workflow. PostScript is described as a "device-independent page description language". More accurately it is a 'document description language'. This definition implies that an operator should be able to send a PostScript file to any device that can interpret PostScript. PostScript, however, was not designed to be a file format for digital file delivery. It was designed to meet the needs of output devices, not the needs of production personnel. PostScript is a computer language, not a file format. Once an application file has been converted to PostScript, it is embedded with certain characteristics of the target device – a specialized dialect of PostScript, if you will, and there is a good chance the file will not output on any device other than the one intended. Converting an application file to PostScript for transport does render the file uneditable, but the file must be created to meet the exact output specifications of the pre-press service provider. Because of the need for intervention by the operator at many steps in the process. PostScript has not become an ideal solution for exchanging digital information.



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