

## EPS

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The EPS (**Encapsulated PostScript**) format is widely accepted by the graphic arts industry for saving images that will be placed into programs such as Adobe Illustrator® and QuarkXPress™. It is used on both the Mac and PCs. It was originally created as an output format for printing images. The EPS format is usually used for vector files but can also be used for raster files. One reason to use EPS in an image editing program would be to save duotones, as they can only be saved as EPS. If you are using bitmap mode, the EPS format allows you to save the white areas of your image as transparent areas. The EPS format is also used if you are saving an image with a clipping path.



Save vector images as EPS



Save raster images with clipping paths as EPS

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## GIF

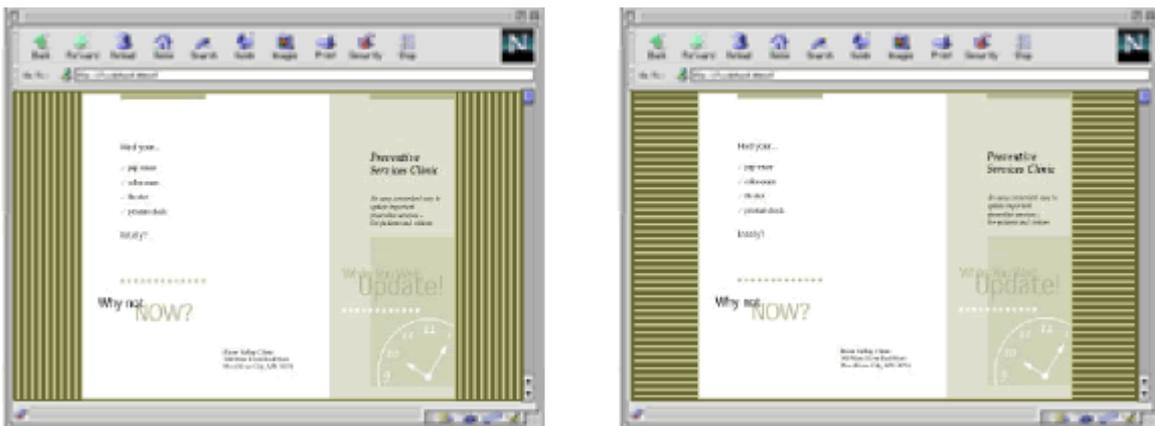
GIF (**Graphics Interchange Format**) is an image format developed by CompuServe and is the most common type of image format used on the Web. It was developed as a way to store images in small files that can be quickly exchanged and easily downloaded. GIF files have a color depth of 8 bits per pixel, so the image must be in Index color mode in order to be saved as a GIF. The word pixel is short for picture element, the smallest unit of a digital picture. 8 bits per pixel makes a total of 256 different colors (see **color bit depth**). GIF files can be accurately displayed on a greater number of systems, as most systems can display at least 256 colors. GIF files are also saved as low-resolution, usually 72 ppi. The GIF format should never be used for images that will be professionally printed. If you have an image you would like to put on the web and also printed, you will need to save two separate files, one as a GIF and one as a TIFF or EPS.

GIF compression is known as a "lossless compression" method, in which the image is analyzed and compressed without the loss of the original picture data. The GIF format is best suited for items like logos, banners, buttons, and graphics, because most of these items are designed with the 256 color palette (8-bit color). If the items are saved as a GIF, none of the original color data will be lost. If the GIF format is used for an image that is larger than 8 bit color, such as a photograph, then the colors in the image that are not found in the 8-bit color palette will be **dithered**. There is no problem with dithering the colors except that it creates a much larger file size because there is more information to store due to the number of extra

pixels required to create the dithered color.

The compression technique used with GIF is called LZW compression, which stands for Lempel, Ziv, and Welch. Lempel, Ziv, and Welch are the mathematicians who were the inventors of this technology. The computer maker Unisys holds the patent on LZW file compression technique which means that anyone creating GIF files should owe Unisys a licensing fee for the use of the LZW compression technology. Most software programs like Adobe Photoshop® and Macromedia Fireworks®, that are used to create GIF files, are already licensed by Unisys, so most people should not have to worry about it.

A technique called "run length encoding" is used in GIF compression. The "run length encoding" technique records the color changes of each horizontal line of pixels, from left to right. If a complete row of pixels is of one color, then there is less data to record. When there are fewer color changes per row of pixels, the result will be a smaller GIF file and a faster loading time. If the file size and the loading time are of a major concern, then large amounts of extra vertical detail should be avoided. In the example shown below, a border of stripes was added to each identical GIF image. The image with the vertical stripes on the left, will cause the file size to be larger because there are more color changes to record on each horizontal row of pixels. The horizontal stripes on the image on the right, create a smaller file because there are fewer color changes running horizontally along the image.



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## JPEG

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The JPEG (**J**oint **P**hotographic **E**xperts **G**roup) format/compression technique was developed specifically for photographs. JPEG is utilized to gain high compression levels for photographic images without sacrificing the image quality. It is used exclusively for the compression of 24-bit images and it will not work for images less than 24-bit. It also does not work very well for non-photographic images such as illustrations, cartoons, flat color areas, or images with defined edges. JPEG is much more suitable for images that contain irregularities and soft edges rather than images with many straight lines and hard edges. The irregularities cause the pixels to be less well defined, which decreases the size of the file. The more irregular the image is, the better suited it is for JPEG.

**Note:** The JPEG format is used mostly for the web and for PhotoCDs. Images that will be used in a page layout program and printed on a press should NOT be saved as JPEGs.

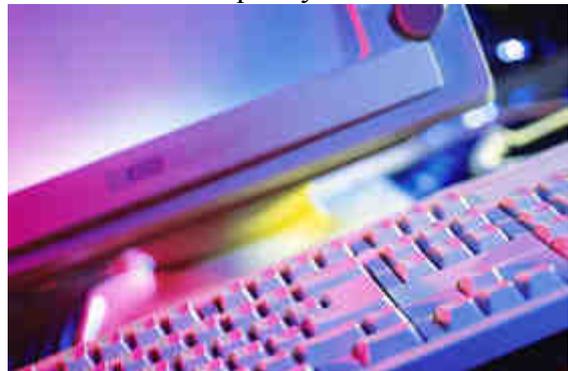
24-bit JPEG images look great on 24-bit monitors, but may not look so good on 8-bit or 16-bit systems. The colors in the 24-bit image that are not contained in the 8-bit or 16-bit palette of the computer system, will be dithered. Even if flat areas of color in the JPEG image are among the colors in the 8-bit or 16-bit color palette, there could still be problems with the JPEG image when viewed on a lower bit depth system. The JPEG compression process introduces elements into the solid color areas that make the images look muddy or blurry.

JPEG compression is known as "lossy compression", which means that non-essential data is lost during the compression. JPEG images may be compressed at several levels. The way the compression works is that the image data is separated into levels of importance. The more the image is compressed, the more levels of information are thrown out, which creates a smaller file, and along with it, the loss of image detail. The loss of this data is permanent and it cannot be restored. If the image is not compressed by too great a factor, the overall quality does not suffer that much. With JPEG, you have the choice of compressing an image without sacrificing too much in the way of image quality, or you can have the advantage of having a greatly reduced file size, but a resulting image of much poorer quality.

100% quality = 78.81k



25% quality = 6.73k



Even though the image on the right has been compressed to 25% of the quality of the original image on the left, the quality of the right image is still tolerable and the file size has been reduced to less than one-tenth of the original.

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## Native File Formats

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### Native File Formats - Photoshop

As you are working on your file, you can save it in the native Photoshop® format. The Photoshop® format retains layers, channels, and clipping paths. Once you have completed the file, save it again as a Photoshop® file and then do a "Save a Copy as", in order to save it in another format such as TIFF or EPS. When you save the file in the TIFF or EPS format, you have to flatten your layers first which makes it harder to come back later to edit the file.

Because the flattening makes it difficult to edit, you should always keep your original Photoshop® file so that additional editing can be performed later. QuarkXPress™ cannot import the Photoshop® format without a special XTension, but Adobe InDesign™ is capable of importing the Photoshop® format.

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## PDF

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Adobe® Systems developed the PDF (**P**ortable **D**ocument **F**ormat) as a file format which allows a document to be viewed on any computer, and it will look the same on all of them, regardless of how it was created or on which operating system it is viewed on. The PDF format stores all of the fonts, colors, and graphics in such a way that these components will look exactly as they were intended to look. Also, regardless of the printing device that is used, a PDF file will print correctly on all of them.

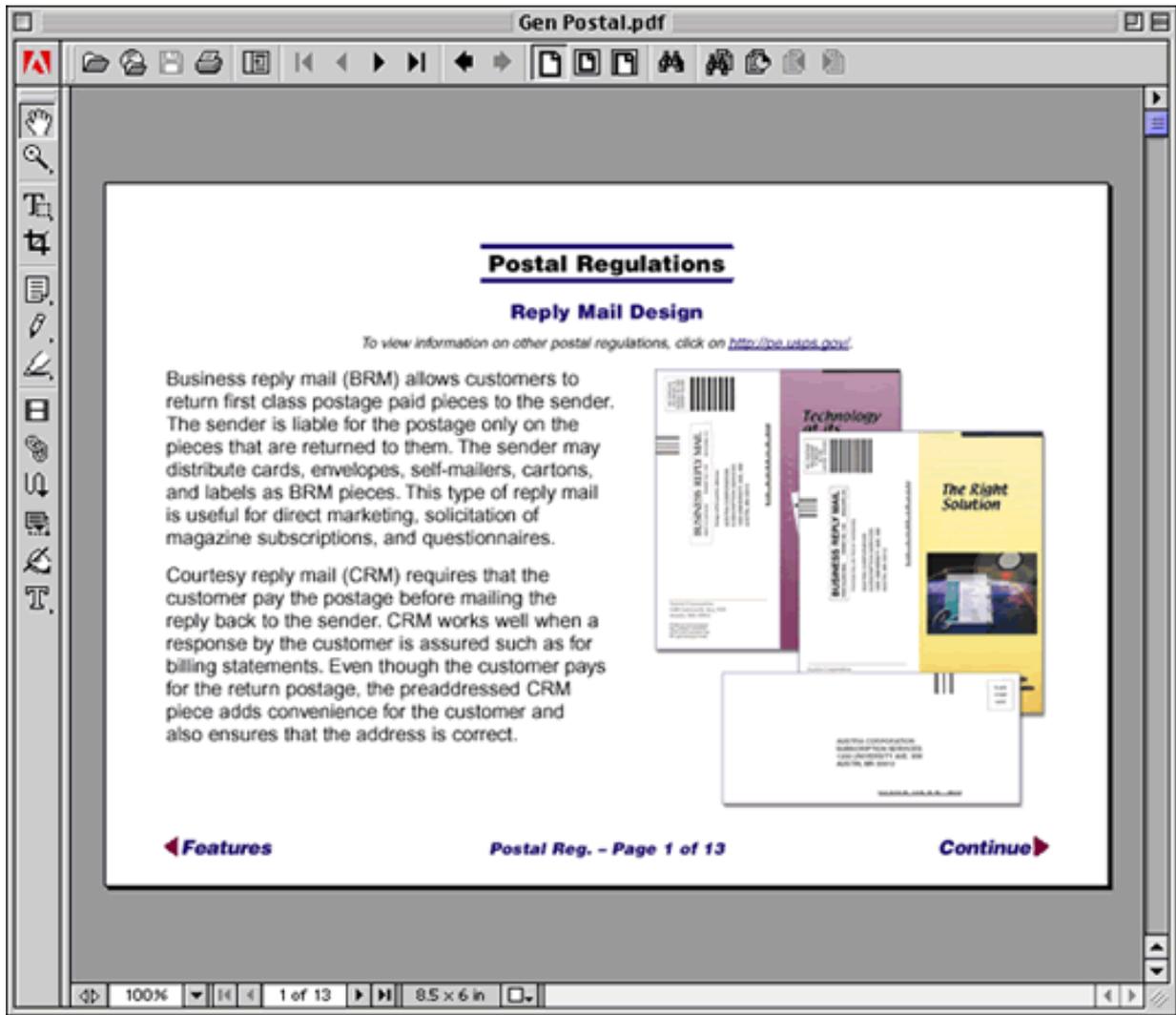
Converting files to PDF is one of the best options when transferring files via email or the Web. It ensures that the files will be readable on other computers. PDF removes the problems of files not opening properly on different computer systems or not opening at all.

PDF files are much smaller than the files they originate from and download faster for display on the Web. They can be attachments for e-mail and can be integrated with Web sites or CD-ROM applications. PDF files can be augmented with video, sound, Web links, and security alternatives for more enjoyable viewing.

Once a document has been saved as a PDF file, you are very limited with your ability to edit the document. Because of the editing limitations, the document should also be saved in its original format so that if it is necessary to make changes to the document, the editing can be accomplished easily using the original program in which it was designed. The edited document can then be resaved as a PDF file.

In order for a PDF file to be viewed on any computer, the computer must have Adobe Acrobat Reader® installed on it. The software is free and can be downloaded from the Internet from the Adobe® site at **www.adobe.com**.

The illustration below shows a PDF document displayed on Adobe Acrobat®.



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## TIFF

TIF or TIFF format (**T**agged **I**mage **F**ile **F**ormat) is the most common format for saving bitmapped images that will be printed or imported into a page layout program such as QuarkXPress™. It can be used on both the Mac and the PC. It was originally created by the Aldus Corp. for saving scanned images. A TIFF file can be CMYK, RGB, grayscale, index, or bitmap.

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## Proofing

A proof is a quality control tool that is used as a means of communicating the overall concept of a project between the production staff and the customer. The type of proof and the quantity of proofs that are made may vary with each job. If the proofing process is completed accurately, any problems or errors can be caught before a job is printed.

There are a wide variety of proofing systems and different technologies to choose from. It is important to understand the different processes and the advantages and

disadvantages of each. When choosing a proofing method, consider the following factors: cost, repeatability, accuracy, and the workflow used to produce the final image.

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