

Myths & Facts About JPEG

With the explosion of scanners, digital cameras and the World Wide Web, the JPEG image format has quickly become the most widely used digital image format. It's also the most misunderstood. Here's a collection of some common misconceptions and facts about JPEG images.

JPEGs lose quality every time they are opened and/or saved.

False. Simply opening or displaying a JPEG image does not harm the image in any way. Saving a JPEG repeatedly during the same editing session (without ever closing the image) will *not* accumulate a loss in quality. Copying and renaming a JPEG will not introduce any loss, but some image editors *do* recompress JPEGs when the Save As command is used, so in order to avoid more loss you should duplicate and rename JPEGs in your file manager rather than going through a photo editing program.

JPEGs lose quality every time they are opened, edited and saved.

True. If a JPEG image is opened, edited, and saved again it results in additional image degradation. It is very important to minimize the number of editing sessions between the initial and final version of a JPEG image. If you must perform editing functions in several sessions or in several different programs, you should use a image format that is not lossy (TIFF, BMP, PNG) for the intermediate editing sessions before saving the final version. Repeated saving *within the same editing session* does not introduce additional damage. It is only when the image is closed, re-opened, edited and saved again.

JPEGs lose quality every time they are used in a page layout program.

False. Using a JPEG Image in a page layout program does not *edit* the source JPEG image, therefore no quality is lost. However, because each page layout software uses different types of compression on their native document files, you may find your layout documents are considerably larger than the sum of the embedded JPEG files.

If I compress a JPEG at 70%, then later reopen it and compress it at 90%, the final image will be restored to a quality setting of 90%.

False. The initial save at 70% introduces a *permanent* loss in quality that cannot be restored. Saving again at 90% quality only introduces additional degradation to an image that has already had considerable loss in quality. If you must decompress and recompress a JPEG image, using the *exact* same quality setting each time seems to introduce little or no degradation to the unedited areas of the image. Because of the way JPEGs are processed, however, the same setting rule just explained does not apply when *cropping* an image. JPEG compression is applied to an image in small blocks, typically 8 or 16 pixel increments. When you crop a JPEG image, the entire image is shifted so that the blocks are not aligned in the same places

Choosing the same numeric quality setting for JPEGs saved in one program will give the exact same results as the same numeric quality setting in another program.

False. Quality settings are not standardized across graphics software programs. In other words, a quality setting of 75 in one program may result in a much poorer image than the same original image saved with a quality setting of 75 in another program. It's also important to verify what your software is asking for when you set the quality. Some programs have a numeric scale with quality at the top of the scale

so that a rating of 100 is the highest quality with little compression. Other programs base the scale on compression where a setting of 100 is the lowest quality and the highest compression. Some software and digital cameras use terminology like low, medium, and high for the quality settings

A quality setting of 100 does not degrade an image at all.

False. Saving an image to JPEG format, *always* introduces some loss in quality, though a quality setting of 100 will usually not be detectable by the average naked eye. In addition, using a quality setting of 100 compared to a quality setting of 90-95 or so will result in a considerably higher file size relative to the degree of image loss. If your software does not provide a JPEG preview, try saving several copies of an image at 90, 95, and 100 quality settings and compare file size with image quality. Chances are, there will be no distinguishable difference between the 90 and 100 image, but the difference in k-bytes could be significant. Keep in mind, however, that subtle color shifting is one effect of JPEG compression—even at high quality settings—so JPEG should be avoided in situations where precise color matching is important.

Progressive JPEGs download faster than ordinary JPEGs.

False. Progressive JPEGs display gradually as they download, so they will appear initially at a very low quality and gradually become clearer until the image is fully downloaded. On a slow Internet connection, this may give the illusion of a faster download, but usually a progressive JPEG is larger in file size and requires more processing power to decode and display. It's important to note that some software is incapable of displaying progressive JPEGs, most notably, the free Imaging program bundled with many versions of Windows.

JPEGs require more processing power to display.

True. JPEGs not only need to be downloaded, but decoded as well. If you were to compare display time for a GIF and a JPEG with the exact same file size, the GIF would display marginally faster than the JPEG because it uses a different compression scheme which does not require as much processing power to decode. This slight delay is barely noticeable, except perhaps on extremely slow modem connections.

JPEG is an all-purpose format suitable for just about any image.

False. JPEG is best suited for large photographic images where file size is the most important consideration, such as images that will be posted on the Web or transmitted via e-mail and FTP. JPEG is *not suitable* for most small images under a few hundred pixels in dimension, and it is not suitable for screen shots, images with text, images with sharp lines and large blocks of color, and images that will be edited repeatedly.

JPEG is ideal for long-term image archival.

False. JPEG should only be used for archival when disk space is the primary consideration. Because JPEG images lose quality each time they are opened, *edited* and saved, they should be avoided for archival situations where the images will need to go through further processing steps. *Always keep a lossless master copy of any image you expect to edit again in the future.*

JPEG images do not support transparency.

True. You may think you've seen JPEG image with transparency on the Web, but in fact the image was created with the intended background incorporated into the JPEG in such a way that it *appears* seamless when layered on a Web page with the same background image. This works best when the background is one with a subtle texture where seams are indistinguishable. However, because JPEGs are subject to some color shifting, in many cases, the overlay may never appear totally seamless.

JPEG2000 is on the way and it will solve all the problems with JPEG.

Let's wait and see. JPEG2000 was initially proposed in 1996. We're now in the second quarter of 2001, and JPEG2000 is still not yet an accepted international standard. It can take years before image editing software and Web browsers are able to support a new format and that cannot happen until the format is finalized and accepted as a standard. For more information on JPEG2000,

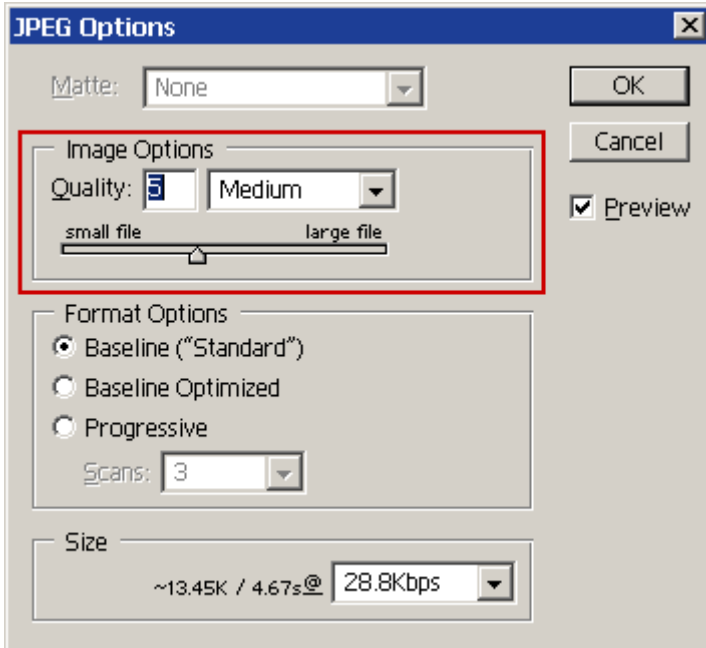
I can save disk space by converting my GIF images to JPEGs.

False. GIF images have already been reduced to 256 colors or less. JPEG images are ideal for large photographic images with millions of colors. GIFs are ideal for images with sharp lines and large areas of a single color. Converting the typical GIF image to JPEG will result in color shifting, blurring, and loss in quality, and in most instances the resulting file will be larger. In general, it is not of any benefit to attempt a GIF to JPEG conversion if the original GIF image is more than 100 Kbytes. PNG is a better choice.

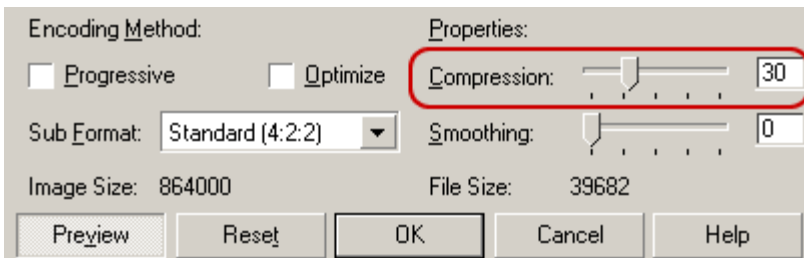
All JPEG images are high resolution, print-quality photos.

False. Print quality is determined by the pixel dimensions of the image. To print a 4 by 6 inch photo, the image must have at least 480 x 720 pixels for an average quality print, and 960 x 1440 pixels or more for a medium to high quality print. Because JPEG is often used for images to be transmitted and displayed via the Web, these images are typically reduced to screen resolution and do not contain enough pixel data to get a high-quality print. When saving JPEG images from your digital camera, you may wish to use your camera's higher quality compression setting to reduce the damage done by JPEG compression. I'm referring here to the *quality* setting of your camera, not resolution (which effects pixel dimensions). Not all digital cameras offer this option.

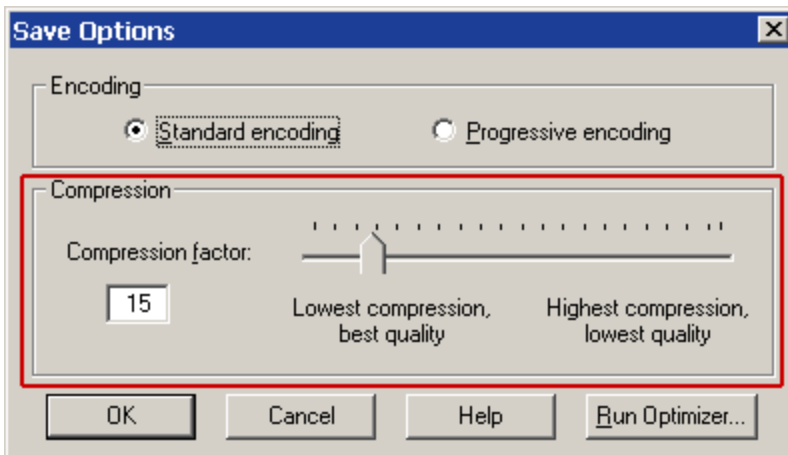
Below you'll find screen shots for the JPEG save options in various image editing software. Sometimes you have to click a "more" or "options" button in order to access these settings in your software when you use the save command. If you don't see a button for more options, chances are the options will pop-up automatically after you choose a file name and click Save. Note the Progressive option in each screen shot. Some programs offer previews or estimate the file size of the final JPEG image according to your settings. I've cropped out the previews in these screen shots to reduce the size of these screen shots.



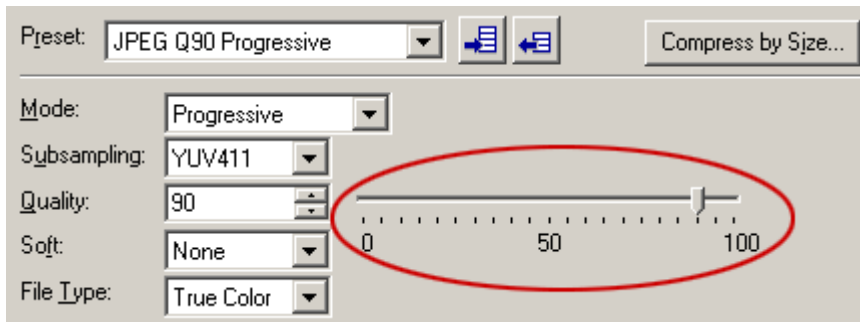
JPEG save options in **Adobe Photoshop 6.0**. The highest setting is 12 which results in the least compression and the largest file size.



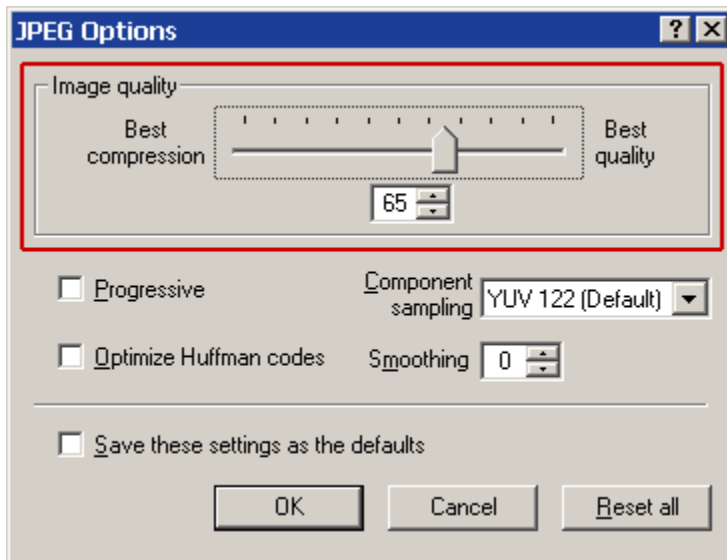
JPEG save options in **Corel Photo-Paint 10**. The more you move the slider to the right, the lower the image quality will be and the smaller the file size. Preview images have been cropped out.



JPEG save options in **Paint Shop Pro 7**. Not much explanation required here. The Run Optimizer button takes you to Paint Shop Pro's Image Optimizer which provides before and after previews and file size estimates.



JPEG save options in **Ulead PhotoImpact 6**. A quality setting closer to 100 results in a larger file with higher quality. The preview image has been cropped out of this screen shot.



A higher quality setting results in a better image and larger file.