



Optimizing images for web

Not optimizing images properly results in extremely slow loading time. When you intend to publish your images online, you have to compromise the quality.

This tutorial explains in detail how to use Photoshop's **Save for web** option to get the best possible quality in the smallest file possible.

At the bottom of the page is a comparison table so you can see how these different formats and compressions play out in real life.

Image formats

There are many image formats available, but only a few work on the web. They differ in some important properties.

There are two kinds of image compression, **lossy** and **lossless**.

Lossy compression means once you decompress the compressed data, you will not get the exact same image as the original. However, this will only be visible at a closer look. Lossy compression is good for web, because images use small amount of memory, but can be sufficiently like the original image.

When you decompress a lossless image, you will get exactly the same image as the original. This compression uses greater amount of memory, so sometimes it may not be good for web.

JPEG

JPEG is a format with the extension **.jpg**. This image type is lossy, and you can control the compression level in image editors.

It is good for saving images with millions of colors, like photographs, drawings with many shades, images containing gradients etc.

This is an example of a JPEG image:



GIF

This format is a **bitmap**, which means it's a grid made of tiny pixel squares. Data about every pixel is saved (so it's lossless), and you can save up to 256 colors. Pixels may also be transparent.

GIF may contain more than one frame, so it can be animated.

Since image programs can control the exact number of colors stored in a particular image, it is a good format for saving images with less colors, like charts, small graphics (bullets, website buttons), images containing text, flat-color drawings etc.

This is an example of a GIF image:



PNG

This format was created to become the new and improved GIF, because GIF was patented. PNG is a lossless format.

There are two types of PNGs, an 8-bit and 24-bit. 8-bit can store up to 256 colors, like GIF. 24-bit can store millions of colors, and it also has partial transparency.

It's best to save images in this format when you need to preserve both transparency and a large amount of colors.

This is an example of an 8-bit PNG image:



This is an example of a 24-bit PNG image with transparent background:



Saving images for web

Option for exporting images for web is found under **File > Save for web...** — other graphic editors must have something similar, probably under **File > Export**.

Saving images with many colors

Original image saved at 100% quality [171KB] (<http://inobscuro.com/image.php?file=extras/tutorials/images/optimize00.jpg>)

Choose **File > Save for web...**

Since it's a photograph, choose JPEG.

You can check the option **Progressive** if you like, it's only difference is how the loading will look like. Progressive images first appear blurry, and then become clearer as the image loads. Non-progressive images load line-by-line.

First choose quality level, **High** if the image will be visible, **Medium** or **Low** if it's meant as a background.

To have more control over the quality, use the slider or enter number in the field **Quality**

Look at the file size and estimated loading time displayed in the lower-left corner while adjusting settings. At the same time, look at the image to decide on what quality looks good enough.

If it's a background, make sure file size is under 5KB, up to 2KB would be better.

If the image is a layout header, up to 40KB is acceptable.

If it's an image to be displayed on the page, up to 70KB is reasonable, depending on dimensions.

Artworks and photographs for your portfolio may be saved in better quality, since people who will look at them already expect to see large images. In this case it's normal to have file sizes from 100 to 200KB, but not more than that.

Once you have found the perfect balance between quality and compression, click the button **Save**

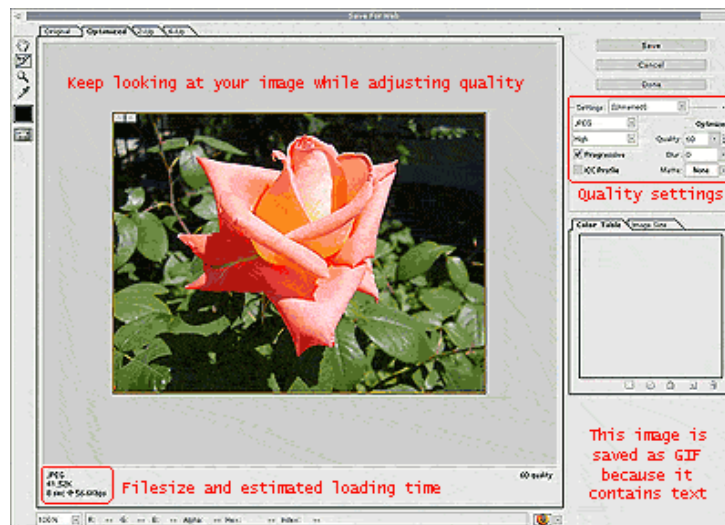


Image saved at 60% quality [42KB] (<http://inobscuro.com/image.php?file=extras/tutorials/images/optimize02.jpg>)

The image above would load in about 8 seconds on 56kbps connection. Its quality is not the best, some areas appear blurry, but it's still good enough for web purposes, and we used 75% less memory than before. This is how images with lots of colors should be saved.

Saving flat-color images and charts

Original image saved in JPEG at 100% quality [177KB] (<http://inobscuro.com/image.php?file=extras/tutorials/images/optimize03.jpg>)

Choose **File > Save for web...**

Since it has less colors, choose GIF.

If the image contains empty (transparent) pixels, make sure **Transparency** is checked.

Select the number of colors — try to make the number the smallest you can, while at the same time the image looks decent.

If the image is not in the main focus (ie. background) try adding some **Lossyness** by dragging the slider to the right. This will reduce the file size.

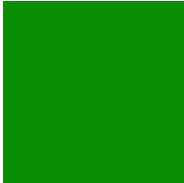


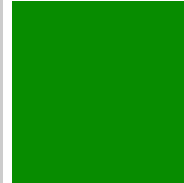










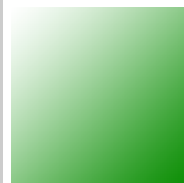
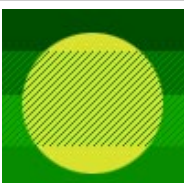
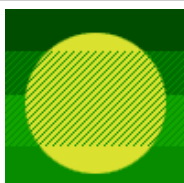
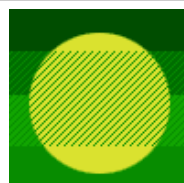
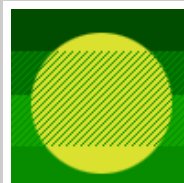
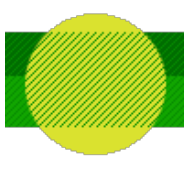
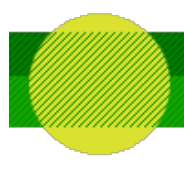
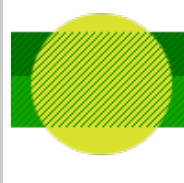



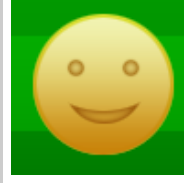
Once you have found the perfect balance between quality and size, click the button **Save**









Image saved in GIF, 8 colors, 50% lossy [25KB] (<http://inobscuro.com/image.php?file=extras/tutorials/images/optimize04.gif>)

The above image would load in about 5 seconds on 56kbps connection. If you take a closer look, you'll spot some differences, but the image still looks good enough to be a background — what is more important, it's only 15% of the original file size!

Comparison of formats

To provide a clearer overview of different formats and compressions, here is a table:

Graphic type	JPEG	GIF	PNG-8	PNG-24
Single color	 378 bytes	 156 bytes	 588 bytes	 809 bytes
Anti-aliased text on a solid background	 1876 bytes	 566 bytes	 1015 bytes	 1791 bytes
Anti-aliased text on a transparent background	no transparency	 365 bytes	 867 bytes	 1538 bytes
Gradient	 742 bytes	 2331 bytes	 1072 bytes	 1299 bytes
Flat colors	 3006 bytes	 964 bytes	 1237 bytes	 2346 bytes
Flat-color motive on transparent background	no transparency	 784 bytes	 1105 bytes	 2007 bytes
Full-color motive	 3006 bytes	 964 bytes	 1237 bytes	 2346 bytes

Graphic type	JPEG	GIF	PNG-8	PNG-24
	2942 bytes	2662 bytes	2270 bytes	4847 bytes
Full-color motive on transparent background	no transparency	 2373 bytes	 2333 bytes	 5211 bytes
Animation	no animation	 16086 bytes	no animation	no animation
Photo	 4208 bytes	 6995 bytes	 7521 bytes	 23810 bytes

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