



Digital Images in Print

Ever taken digital photos that turned out to be too “low resolution” for print? For better results, read on.



300 PPI

50 PPI

In printing, we reproduce photos using screens. Look at a photo on a printed piece more closely and you’ll find that smooth variations in tone are actually dots in a uniform pattern. The dots vary in size to make lighter or darker shaded areas.

Some dots are very noticeable – such as those used in newspaper printing. Others are very tiny and complex – such as those used for fine art printing. The difference is that the newspaper uses an 85 LPI screen while the art print uses a screen of 175 LPI or more. To say a screen is 85 LPI is to say 85 dots will fit in a one inch row. The finer the dots, the higher the number of lines per inch – and the smoother the illusion of a continuous tone.

When a digital photo is used in offset printing, photo pixels must be converted into line per inch dots. There must be 2 pixels per line screen dot. In order to look good at 150 LPI, the photo needs to contain 300 pixels per inch or 300 PPI. This is a “high resolution” image.

In a holdover from pre-pixel days, this might also be referred to as 300 DPI or dots per inch. At any rate, if the image is less than 300 PPI, it may appear “jagged” or “pixellated” in print — the pixels draw attention to themselves. This is true *even if the same image looks fine on your website*. Your computer monitor requires less resolution.

If you have any questions regarding the images you intend to use in your print project, our staff is happy to answer them. Call us toll free at (800) 622-0676, and a representative will assist you.



When using a digital camera to take photos intended for offset print, it is important to choose a setting which will yield high resolution images. Unfortunately, you probably will not discover a “300 PPI for Print” setting on your digital camera. Here is an easy solution. Your camera settings do use terms like pixels and megapixels. Each pixel occupies one byte of memory. More pixels eat up more memory *and* more pixels equals higher resolution

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images. So the setting which yields fewer pictures (say 12 images rather than 64) is the setting which provides pictures of higher resolution. Larger images naturally take up more room.

Or you could take a more complicated approach. File size is determined by a few things: the number of color channels, the image pixel size and the file format used. If we have an image intended to appear on the printed page at 4 x 6 inches at 300 PPI, multiply 4 times 300 and 6 times 300. That works out to 1200 x 1800 pixels. So a 1200 x 1800 setting is what you're looking for on your camera to get the result you want.

Something to keep in mind: all digital cameras process images at 72 PPI. In our example of 1200 x 1800, the dimensions of the image at 72 PPI would be 16.67 x 25 inches. When that image's resolution is changed to 300 PPI in Photoshop (making sure that resample is unchecked), the resulting image is 4 x 6. So the math works!

So if 300 PPI is acceptable won't 600 PPI be even better? Not really. As an image is processed for print, the RIP (raster image processor) only needs so much information for each image. An image above 450 PPI contains more info than the computer needs to "RIP" that image for 150 LPI printing. Resolution that high simply slows down the process.



Lastly, we want to look at different file formats that can affect file size and picture quality. Saved as a TIFF with no compression, our 4 x 6 300 PPI photo would take up 6.4 megabytes. TIFF also offers the option of LZW compression which is non-lossy (doesn't degrade the image each time it is compressed). JPEG is a more common format for digital cameras and it compresses the information as well, but some of the information is lost each time you resave the image. So repeated use of JPEG tends to degrade the photo. Make a copy of an image using a slightly different name. Open the copy, re-save as JPEG, then repeat this 9 or 10 times. Then re-open the original and compare. The differences are quite noticeable. We always recommend saving images as TIFF or EPS to retain image quality.

Don't forget: Panaprint offers complete scanning and color correction services for your non-digital photos!