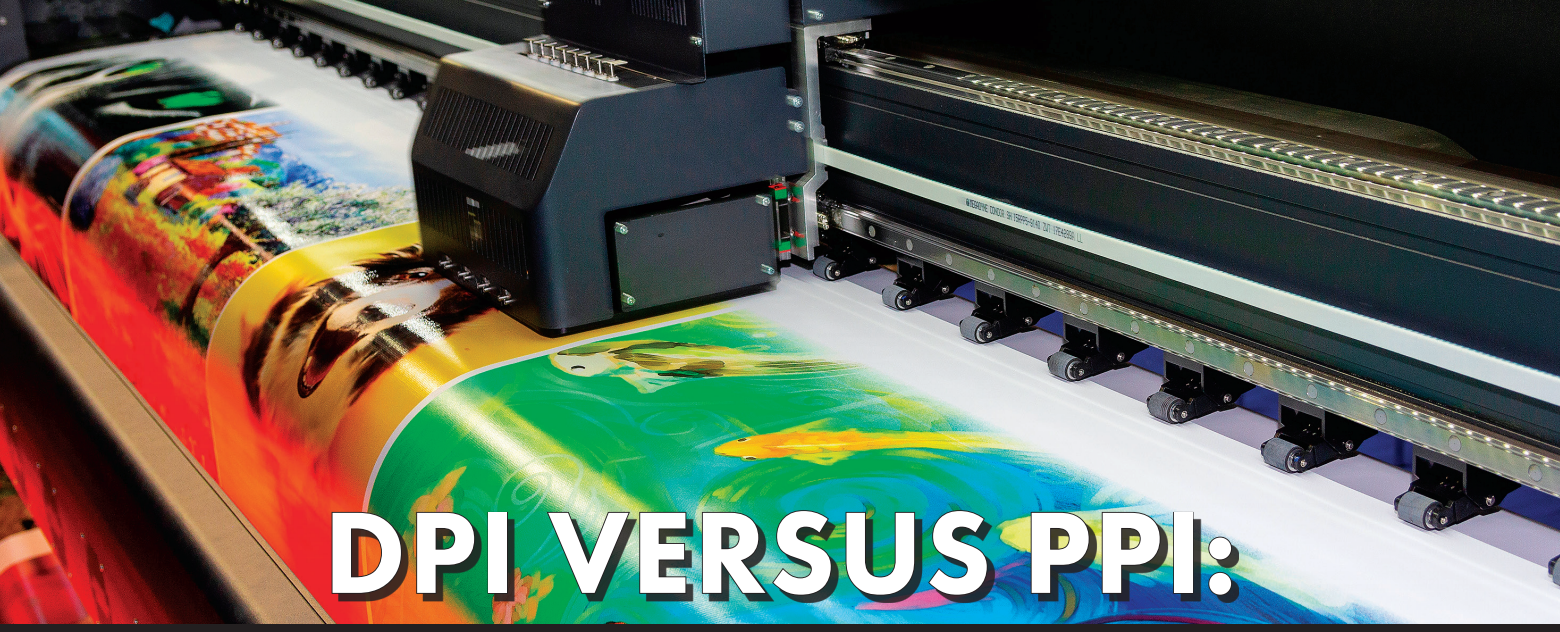


DPI VERSUS PPI:

DEMYSTIFYING DIGITAL AND PRINT RESOLUTION

By Marc Aguilera

For professional framers getting started with digital printing, DPI and PPI are fundamental elements of today's digital workflows. While the terms are related, many people mistakenly use PPI (pixels per inch) and DPI (dots per inch) interchangeably when talking about resolution, extending confusion surrounding both terms.

The term DPI stems from traditional offset printing and drum scanning workflows where halftone dots were converted to halftone dots for image setting. Before digital workflows, DPI was the term used to discuss the computer to plate workflow. However, today the terminology is applied to digital processes inappropriately. You won't find references to DPI or dots in Adobe Photoshop or image editing software because everything digital is made of pixels.

DEFINING PPI AND DPI

While both DPI and PPI are related to resolution, they are two completely different measurements:

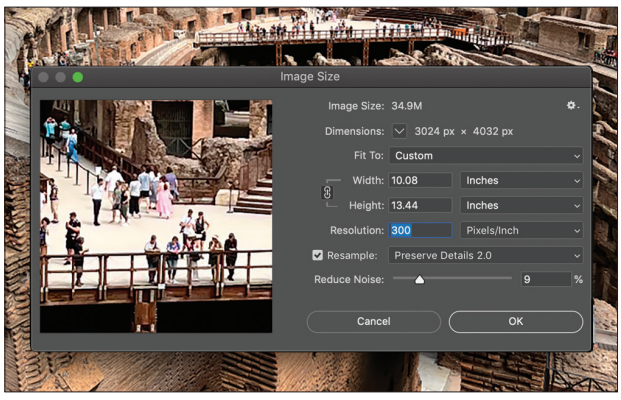
- **DPI** = Dots per inch refers to the number of dots used to create a printed image. In digital printing, tiny colored dots of ink are used to create an image on paper, canvas, metal, and more. The density of the dots impacts the quality of the final print. This term should be referenced when discussing the print quality.
- **PPI** = Pixels per inch refers to the resolution of a digital image on a screen. Older displays traditionally offered 72 PPI. This term is referenced when discussing the digital file and the digital image details.

Both measurements are crucially important to creating a final image as you view work on a screen and then prepare a file for printing.

USING PPI IN PHOTOSHOP

From a capture standpoint, it is always good to capture an image with a camera or scanner using the highest possible resolution. You can always remove data from a file to make it smaller, but it is harder to artificially add data to a file to make it larger and ensure quality of details.

Once you've captured an image, the file will denote the number of pixels. From an editing standpoint, you can arrange these pixels in any array that you want. It's a simple math equation.

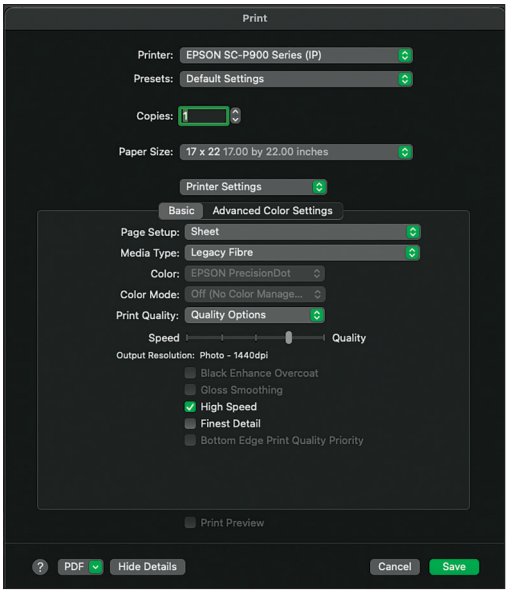


You can set up and adjust PPI in Photoshop by navigating to Image —> Image Size.

You can set up and adjust PPI in image editing software. In the case of Adobe Photoshop, navigate to Image, Image Size, and from there you can add or subtract pixels and view how the resolution range impacts the image makeup in the workflow window. While the process of adjusting an image based on resolution is

completely subjective, for a digital printer catering to the fine art community, it's important to ensure that you are working with a file that has enough resolution to print at the desired final print size.

If you are adding pixels, you are interpolating the image. If you need to make a file larger for printing, between 30-40 percent is the maximum range to use in order to preserve the details. In addition, software algorithms are improving, and image editing software offers a range of options for manipulating an image. For example, in Photoshop, there are options in settings to refine an image based on individual preference including Bicubic Sharpener, Preserve Details 2.0. Each setting is a little different and experimenting with each of them helps refine skills. Once you've made your image selections, click OK to view a preview of the updated image. Make sure that you are viewing the preview at 100 percent to see the true resolution of the file.

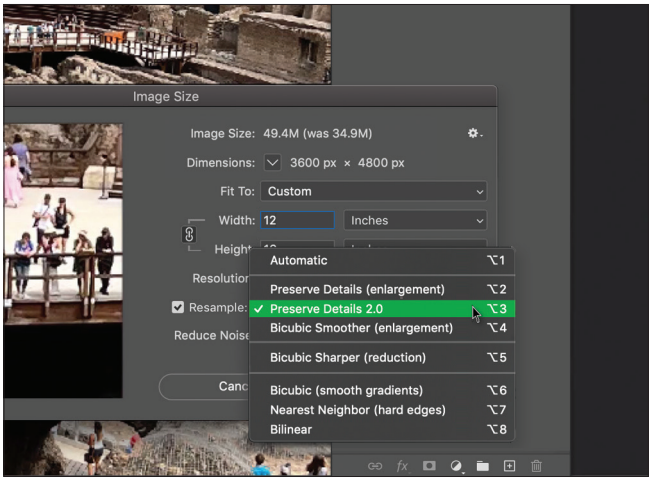


In Photoshop, make the appropriate selections for media type and print quality and then adjust the slider of DPI for printing.

RESOLUTION AND PRINTING DPI

When preparing an image for printing, you'll want to start by making sure you have the correct PPI (and inch dimensions). Secondly, ensure that your printer's DPI resolution is set to the appropriate setting. Some print manufacturers have helpful tools to streamline the editing process and quantify pixels in a file. For example, Epson Print Layout offers a subjective valuation of the number of pixels in an image based on the print size to help make the appropriate image adjustments for the print needs.

There is a general number to ensure the optimal image resolution for printing your file. With the advancement of digital printing technology, 300 PPI is an optimal range to ensure that you get the most photographic detail and output. However, if the original file size is a low-resolution image, it's common that clients aren't happy with the quality of the output.



If you need to make a file larger for printing, between 30-40 percent is the maximum range to use in order to preserve the details.

GOING FROM PIXELS TO DOTS

When printing a file, you go from pixels per inch in the digital image to dots per inch in the printed image. The printing process creates tiny ink droplets that become dots per inch on a surface to create the final image. In Photoshop, make the appropriate selections for media type, and print quality and then adjust the slider of DPI for printing (this might appear slightly different in print dialogue boxes). Depending on the printer, there will be defined print qualities. In the case of Epson Photo Printers, there are various names for print resolution with a defined DPI at each level.

Fine art printers must make a subjective choice on the quality to apply for a given print project based on the output needs for a client while balancing the overall time allotted for the job at hand. When communicating with clients, be clear on realistic expectations for the final output based on file size and resolution of the digital file. In addition, understanding the difference between PPI and DPI and how the two are not interchangeable, but related, will likely result in high-quality, clear output to suit client's needs. Over time, hands-on experience contributes to a printer's control of the final print. **PFM**

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Marc is a product manager at Epson America, Inc. where he is responsible for the SureColor P-Series product line of aqueous pigment inkjet photographic printers for the professional photographic community. With over 20 years of experience in the digital print industry from application engineering to CEO of a growing digital offset/large format print company, Marc is passionate about sharing knowledge of implementing color managed ICC workflows from capture to print.