

Image Resolution vs. Printer Resolution

Confused over why you should not generate an image with a resolution of 2880 pixels per inch to send to your Epson 1280 DPI printer which prints at up to 2880 dots per inch? Join the club and read on.

First the digitized image in your computer is based of pixels, little square boxes composed of one color, some combination of red, green and blue in an RGB image, The more pixels you have in the image the more the image looks like its analog partner, film. The film is not truly analog since it consists of grains of silver which carry the color and you could measure the film in grains per inch. Film is much closer to analog than digitized images since the grains per inch in film are much higher than the pixels per inch in most digitized images today. The more pixels per inch the more the digitized image looks like a continuous analog image not made up of little squares. The bigger you make the image the more total pixels you need in order to minimize pixel visibility. If you magnify any digitized image enough you will see the pixels. If you magnify any film enough you will see the grain or silver particles in the film.

How many pixels per inch are enough to make the image look reasonably close to a continuous analog image? Consider that the computer you are now reading this from has a screen resolution probably somewhere in the 80 pixels per inch category and the image looks pretty good. If you look close you can see the jagged oblique lines caused by making a straight oblique solid line from a series of little squares but it is not bad and you get used to it. With a resolution of somewhere between 200 and 300 pixels per inch the jagged lines become obscure and you generally cannot see them from a normal viewing distance.

A print generated from a digitized image composed of 200 to 300 pixels per inch will look pretty good. Now comes the confusion. Inkjet printers spray ink onto paper and you cannot make the print head squirt little square droplets. The printer sprays ink in little elliptical droplets and the more little droplets you squirt the more the image will look like a continuous analog image. The printer software will intercept the image you send to the printer and convert it to droplets or dots per inch to tell the printhead what color to squirt in each droplet location on the paper. The printer is rated in droplets (dots) per inch and this gives you a figure of merit as to how small the droplets are. The more the better, 2880 DPI is better than 1440 DPI.

The number of pixels per inch in the image is NOT related to the droplets per inch produced by the printer.

You never want to send a digitized image with a resolution of 2880 pixels per inch to a 2880 dots per inch printer. If you tried to make a 2880 pixels per inch image that is sized to 13 x 19 inches you would wind up with a 6 GB (Gigabyte or 1000 MB) image. In addition to that once the print driver got a hold of that image it would try to create a file of dots to send to the printhead and that file will be much greater than 6 GB. In fact for some reason known only to printers the resultant print would look worse than if you sent the printer a file with a resolution of 300 pixels per inch.