

Print Resolution

Understanding 4-bit depth

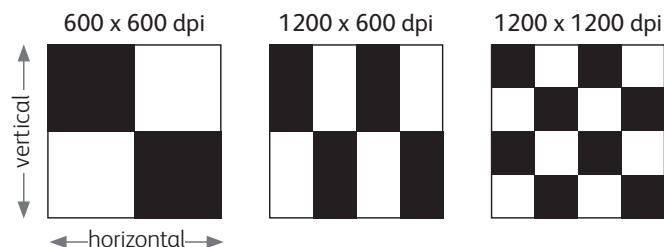
Print resolution capability is typically measured in dots per inch (dpi); however, a laser “dot” can behave differently depending on the output device. Xerox color printers and multifunction printers with 4-bit depth color technology are rated at 600 x 600 dpi, but can produce output that compares well to devices rating a much higher dpi resolution. Here’s why.

Dots per inch

In specifications for laser printers and multifunction printers, print resolution is listed as horizontal dpi by vertical dpi. Some common examples are 600 x 600 dpi or 1200 x 1200 dpi. Higher dpi numbers correspond to smaller dots when printing an image. In general, devices with higher dpi can produce finer lines and more detailed output. Horizontal dpi is determined primarily by the laser used in the device, and the size of the dots the laser utilizes as it scans side-to-side when preparing the image to be printed. Vertical dpi is determined by how quickly the device moves paper through the engine when printing. A device outputs pages slower in 1200 x 1200 dpi mode than in 1200 x 600 dpi mode.

1-bit depth

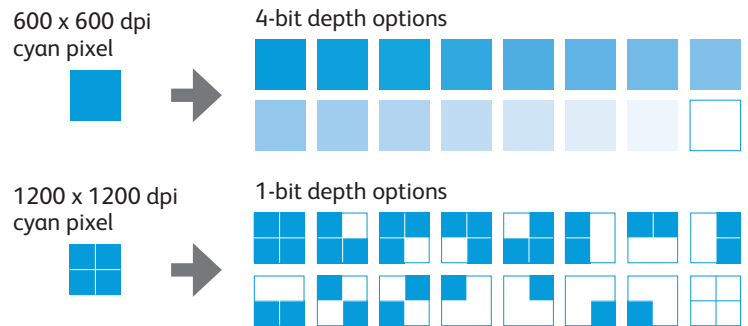
Each of these examples uses 1-bit depth. That means that in each dot position the device can print no dot, or a dot consisting of a fixed volume of toner. Another way of listing these resolutions would be to add bit-depth to the description: 600 x 600 x 1 dpi or 1200 x 1200 x 1 dpi.



These resolution examples show 1-bit depth. With 1-bit depth, each dot is either “on” or “off.”

4-bit depth

With 4-bit depth, a device can produce variable toner volumes at each dot position. This creates more options for each dot than just “on” or “off.” Each dot can have multiple shades of color — as many as 16 shades per dot. The resulting image will have smoother color transitions with more color levels than the image printed by a traditional 600 x 600 (x 1) dpi device. The output can appear similar to — or even superior than — output from 1200 x 1200 (x 1) dpi devices.



600 x 600 x 4 dpi printing delivers up to 16 shades per pixel (of each color). Compare that to 1200 x 1200 dpi printing which delivers up to 4 dots per pixel (of each color). These extra shades deliver more colors and smoother transitions without the speed penalty of increasing to 1200 vertical dpi.

The bottom line

When evaluating color output quality, look beyond the dpi numbers. By virtue of the equal shades of color possible per 600 x 600 dpi pixel space, and the equivalent amount of data used to render color gradation and quality, 600 x 600 x 4 dpi printers are able to intelligently optimize the outputted image and make it comparable to 1200 x 1200 dpi. When you see “1200 x 1200 enhanced image quality” in the Phaser 6600 and WorkCentre 6605 resolution specification, it is to highlight and welcome this comparison.

Xerox 600 x 600 x 4 dpi devices: Phaser® 6500, Phaser 6600, WorkCentre® 6505, WorkCentre 6605