



# Scan Resolutions

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## Line Art

Line art refers to images that contain pure black and white but no tonality (that is, no gray). Line drawings are a common example.

Since these images do not need to be screened, they should be scanned at about 1,200 dpi (dots per inch) at actual size. Either scan these images in line art mode — also called bitmap mode — or use the command Image > Mode > Bitmap to convert the file to line art mode after scanning.

Although these images contain a huge number of pixels, the images are not complex and are of reasonable file size. Line art is usually saved in the TIFF format with LZW compression.

### Examples:

1,200 orthochromatic dpi for normal quality (paper printing)  
2,400 orthochromatic dpi for film quality (negative film)

## Laser Printing

Desktop laser printers use a halftone process similar to imagesetters. However, the extreme low quality of even the best plain paper systems, don't allow for the same tonal qualities. In general, using a resolution of twice the line screen (discussed to the right) is adequate. For most laser printers, 106 ppi at actual size in plenty of resolution. Even with toner-based printers capable of 1,200 dpi of interpolation, using a figure greater than 170 ppi (continuous tone) does not usually improve quality. Test your printer at different resolutions and see the results.

## Multimedia Usage

In general, multimedia uses pixel-based measurements instead of inches and dots per inch. Scanner software uses a far different system. In general, fullscreen multimedia images should be 72 ppi, just under nine inches wide and just under seven inches tall. Files larger than a few megabytes are rarely needed on interactive projects.

## Tonal Photography and Color Scans

Images which will be screened when printed should be scanned at a resolution based on the line screen. Furthermore, editing of these images should take place with anti-aliasing enabled. Anti-aliasing is a technique used to soften edges and avoid "jaggies." The equation used to determine the correct scan resolution is:

$$(\text{Scale Factor}) \times (\text{Line Screen}) \times (\text{Quality Factor}) = \text{Scan Resolution}$$

Scale Factor	the percentage the image will be enlarged or reduced. For actual size use 1.0; to double image size use 2.0; for one-third size use 0.33.
Line Screen	the frequency of the commercial dot screen to be used; that is, the number of halftone dots in a linear inch; i.e. 85 for newspaper; 150 for magazine printing
Quality Factor	the quality of separation desired: 1.5 for low quality ("deadline" quality), 2.0 for commercial quality, and never exceed 2.5. High values will not improve image quality; they will, however, slow down printing and may cause a loss of sharpness.
Scan resolution	the resolution in ppi that the should be scanned.

Once the scan has been completed using this formula, the image may need to be resized to take in to account the scale without changing the file size. Any other scale will affect processing time and quality.

In general, inexpensive scanners offer a percent scale, while more professional scanners require scanning at high resolution at the size of the original and then redistributing the pixels using image size.