Screens represent a method of printing that breaks up continuous-tone images into printable dots. There are two main types of screening: conventional, in which dots vary in size but are all equally spaced in a grid arrangement; and stochastic, in which all dots are the same size but are unequally spaced. Most offset printing is done with conventional screening. Stochastic, in spite of its quality, has been traditionally less popular due to its memory demands. However, it’s gaining ground as technology progresses.

CONVENTIONAL SCREENING

Conventional halftone dots vary in size depending on the amount of ink density. Higher ink density results in a larger dot; lower ink density results in smaller dots. Screens for halftones and separations are measured in lines per inch (lpi), an expression of the screen ruling to the relative size of halftone dots. The grid of halftone cells is commonly referred to as line screen. High screen rulings (175 and 200 lpi) have relatively small dots. Low rulings (85 and 100 lpi) have relatively large dots.

A high screen ruling (finer screen) means the scanner has captured more information. These resulting high resolution images will possess more detail; on the other hand, it will take up more hard-drive space and it will be slower to output. The higher the line screen, the higher the quality in output and in print.

A line screen value, noted as lpi, is very different than ppi and dpi. Resolution is measured in pixels per inch (ppi) on the computer screen and dots per inch (dpi) on a desktop printer or imagesetter. Dots printed as halftones by a printing press are not the same as toner dots output by a laser printer. Resolution is generally discussed in terms of screen frequency. High-resolution scanners, imagesetters, and platesetters produce a wider range of halftone dot sizes than low-res devices and yield a wider range of tones.

There are three halftone dot shapes generally used today--round, square and elliptical. Elliptical is the most commonly used, because it gives smoother midtones in offset printing.

Most projects printed on uncoated papers are printed with 175 line screen. A textured uncoated paper may print effective results with 133 line screen; a well-formed, smooth uncoated paper can handle a 200 line screen or higher. Coated papers are typically printed with 175 or 200 line screens. Each printer will suggest a line screen based on his equipment, the paper specification, and your expectations. Paper representatives can show you samples of various images printed at various screen rulings.

continued
STOCHASTIC SCREENING

Stochastic screening differs from conventional halftone screening in that high ink density results in more dots—not bigger dots. And low ink density yields few dots—not smaller dots. Because stochastic screening involves millions of miniscule dots—many more than are used for conventional halftone screening—the files are enormous. Not all printers have the capability to process the files. It requires sophisticated software and tends to be better suited to computer-to-plate systems. Stochastic offers some distinct advantages over conventional halftone screening:

> It can eliminate moire with repetitive patterns such as herringbones and checks.
> It can print fine line screens (equivalent to 200 lpi and higher).
> It creates easier and smoother tint builds: fine type is smooth; delicate shades such as pastels are possible.
> It can give you virtually unlimited use of spot color.
> It has less dot gain.
> It can correct an image that prints out of register.

Stochastic screening also addresses problems specifically associated with digital printing. For example, stochastic screening can reduce banding when one tone blends into another. It’s good for images with lots of smooth, curvy shapes. Also, because there are so many randomly placed tiny dots, stochastic can soften the hard edges inherent in digital printing.

Talk to your printer about whether or not they use stochastic and what type they are using. Because of the level of detail, provide higher resolution images (300-400 dpi) when your printer is using stochastic screening. Be sure to specify a very smooth paper—either coated or uncoated. Stochastic dots are so small, they can disappear in the crevices of textured paper.

Paper merchants can help by showing you different line screens and stochastic screening examples on your paper of choice. Please call your local paper merchant or Mohawk at 1-800 THE MILL for more information.

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