Empire — THE ART OF PRINTING

Printers use CMYK – Cyan, Magenta, Yellow, and Black inks. Mixing these four colors in various percentages of dots, creates an entire spectrum of colors. This process is called halftoning or screening. Halftoning is when a continious tone image **(Fig. 1A)** is converted into a pattern of dots **(Fig. 1B)**. These dots can range from 20 lines per inch (LPI and/or frequency) to 175 LPI, depending on the output device and the type Aof printing involved. The higher the line count, the smaller the dots and the finer the detail.

FIG. 1A

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

FIG. 1B

FIG. 2
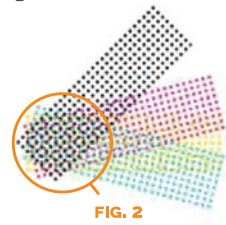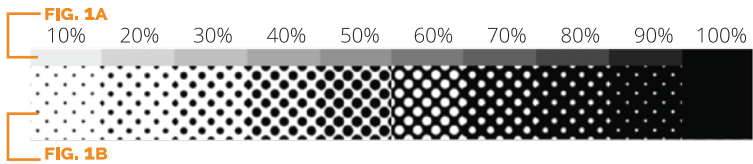
When printing CMYK, each color has it's own screen or plate, so each color has it's own halftone. To improve print quality and reduce morié patterns, each color is output at a different angle. The C, M, K screens/plates are set 30° apart, which produces a rossette pattern **(Fig. 2)**. The yellow, being less noticeable, is set 15° from the other colors.

AT A GLANCE

SCREENPRINTING RESOLUTION:
- 92 LPI / 1270 DPI
- 65 LPI / 1270 DPI

FLEXO RESOLUTION:
- 150 LPI / 2450 DPI (4CP)
- 133 LPI / 2450 DPI (Spot colors)

INDIGO 5600 (DIGITAL) RESOLUTION:
- 175 LPI / 2450 DPI

LINE COUNT (LPI)

From a distance, a viewer cannot see the dots in an image because the line count gives the impression that there aren't any. The human eye no longer sees dots, but rather the complete image. According to the SGIA's "Rule of 240", the optimal LPI is found by dividing 240 by a given viewing distance (in feet). For example, if the image is to be viewed from a distance of 2.4 feet, the LPI would be 240 / 2.4 feet = 100 LPI.

Other examples of when to use different line counts:
Objects held at arm's length..(2.4 feet or closer)........................100 LPI
Counter mats and displays..(2.6 feet)..92 LPI
Overhead counter displays...(3.7 feet)...65LPI
Retail display rocks...(5.3 feet or farther).......................45 LPI

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