

ACTEGA Kelstar Technical Bulletin

Stochastic Issues

Stochastic Imaging is Different!

Traditional screening (AM) is the use of varying sized dots in a fixed grid arrangement. The number of dots (LPI) may vary from 60 to 175 per inch or more. Stochastic screening (FM) uses a fixed spot size (10-40 microns) and varies the number of dots per are to achieve a near continuous tone look.

•**Stochastic Advantages** - The visualized or advertised advantages may be greater than actually realized in a production environment, but there are a few real pluses:

- No Moiré** – Because there are no screen angles or fixed grid, there can be no moiré.
- Less Critical Register** – If the images are a tiny spot or two out of register it does not show or shift color.
- More Continuous** – There are no jump in the number of spots for changing tonal values, thus the prints may look more like photos.
- Wider Gamut** – Some users report being able to more accurately reproduce a wider range of colors in CMYK.

Production Tradeoffs

Several production issues come with using stochastic imaging.

- Proofing** – Accurate and predictable proofing is more important for FM screening because color manipulation on press is almost impossible.
- Over Emulsification** – There is much more opportunity for the ink and water to interact at the dot edges. The small stochastic dots have a much larger edge/area ratio than conventional dots.
- Piling** – If the ink takes on too much water, it will not transfer well and can pile on the image or non image areas.
- Half Tone Mottle** – Too much water will reduce the tack of the ink, and allow first down colors (K and C) to be pulled off the M and Y blankets causing mottle in screens.

Getting the Numbers

Let's compare the actual differences in both types of screening (assume round dots for simplicity):

133 Line Screen – 50% Dot

Diameter = 0.19 mm
Area = 0.028 mm²
Circumference = 0.60 mm

20 Micron Spot

Diameter = 0.020 mm
Area = 0.00031 mm²
Circumference = 0.063 mm

The 133 line dot is about 10 times bigger, but the area is almost 100 times more. Now let's calculate how many 20 micron dots will equal one 50% dot.

$0.028/0.00031 = 90$ spots give an equal area

•**Calculate the Total Perimeter (Edge)** – To calculate the perimeter of both, multiply 90×0.063 mm = 5.7 mm of spot / non image interface versus 0.60 mm for the 50% dot. This means that the fountain solution has nearly ten times higher access to the ink. This greater water interaction is why the problems of over emulsification and piling are often worse with stochastic.

What Can Printers Do?

By understanding that stochastic imaged plates do not behave differently, it may be possible to minimize problems.

- Do not use strong inks** – Weaker inks with more varnish can tolerate more water
- Reduce the water pickup on the ink** which helps to prevent over emulsification
- Increase the non piling additives in the fount** to minimize back trapping and non image piling
- Use a fast release blanket** to reduce blanket tack and thus help with back trapping.

•**Contact ACTEGA Kelstar** at 856 829 6300 or info.actega.kelstar@altana.com for additional information or technical assistance.