FAG FLEX³PRO: a new, easy to use and powerful tool to control and interpret your FLEXO plate making process

by Lukas Pescoller, 02.06.2010

There are now a wide range of new technologies in flexo plate materials, types of screening and imaging equipment these are continuously improving the printing results that can be achieved in flexo.
The minimum dot size and the screen rulings now possible using flexo are comparable to the best results in litho offset.
These new techniques require more sophisticated measurement tools, with a higher resolution and requiring vital new functions to assure a constant and predictable manufacturing process.
FAG Graphic Systems has launched the FAG FLEX³PRO Flexo Plate reader at IPEX.
FAG FLEX³PRO is an affordable, easy to use Flexo Plate reader that can help you to immediately see, manage and interpret any changes to the parameters and thus achieve a superior quality output
The state of the art illumination, pickup optics and camera technology of the FAG FLEX³PRO flexo plate reader delivers extremely sharp images.
The shoulder portion of the dot is clearly separated from the surface of the dot.
Dot printing surfaces with sharp corners that are not artificially rounded due to overexposing can be measured accurately (see figure 1)

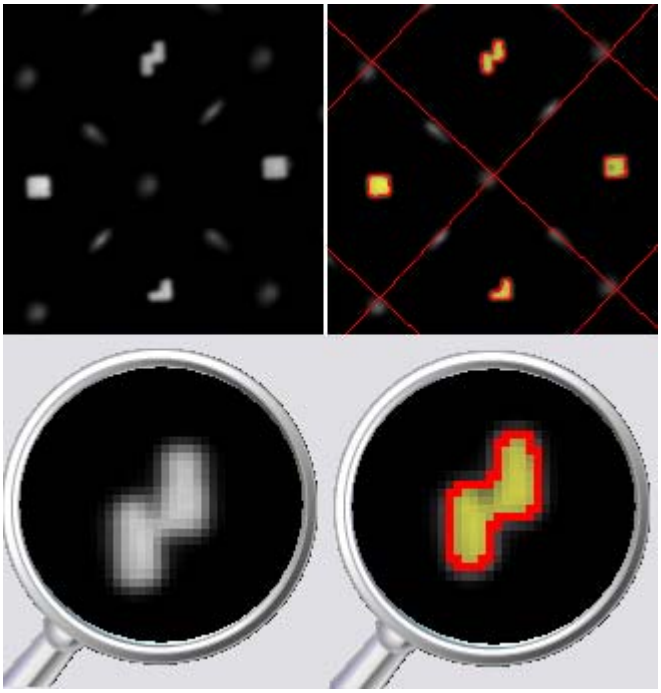

Figure 1: dot printing surface with sharp corners

Having a high quality picture of the dots printing surface is the prerequisite to make the details visible when comparing plates that have been produced with different process parameters. The FAG FLEX³PRO software offers a function to directly compare images, enabling you to see directly the impact of any changes of process parameters. Images captured with any FAG FLEX³PRO device can be loaded and then resized with a resolution of 12700DPI, rotated, corrected in brightness and finally overlaid. The resulting image showing the difference in blue or yellow can be easily interpreted. Figure 2 shows an example of an ablation mask engraved at 1000RPM at the left next to an example of an ablation mask exposed at 700RPM in the middle.
Finally the overlay of the images is displayed at the right.

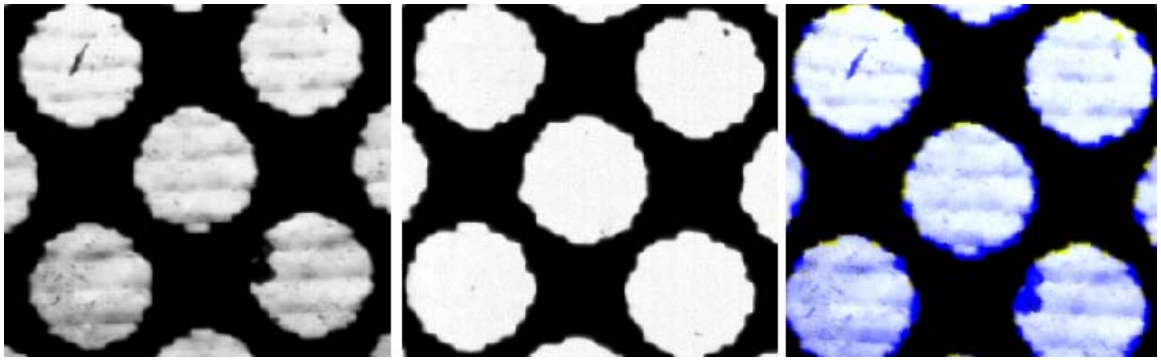

Figure 2: images of ablation masks
engraved at 700RPM, at 1000RPM and overlaid

The blue area of the overlaid image in figure 2 shows the difference in dot size and dot shape between the two imaging speeds. This feature now makes it easy for everyone to understand the impact of process parameters to the finished product. This image comparison is a simple but powerful tool to understand what is happening between mask and plate, what happens to the plate during printing, and what happens between plate and print.

The minimum dot of the flexo plate making process defines the range of one values and the perceived resolution of the printed product.
But what is the minimum dot?
What should the minimum dot look like?
How can it be defined and how can it be consistently maintained from one plate to the next, from one day to the next? Analyzing the minimum dot in transmission mode will result in 0.1% to 0.2% numbers that will not significantly differ from each other however we now know that the Dot Area % value alone is not good enough to control the minimum dot in digital flexo any more (see figure 3).

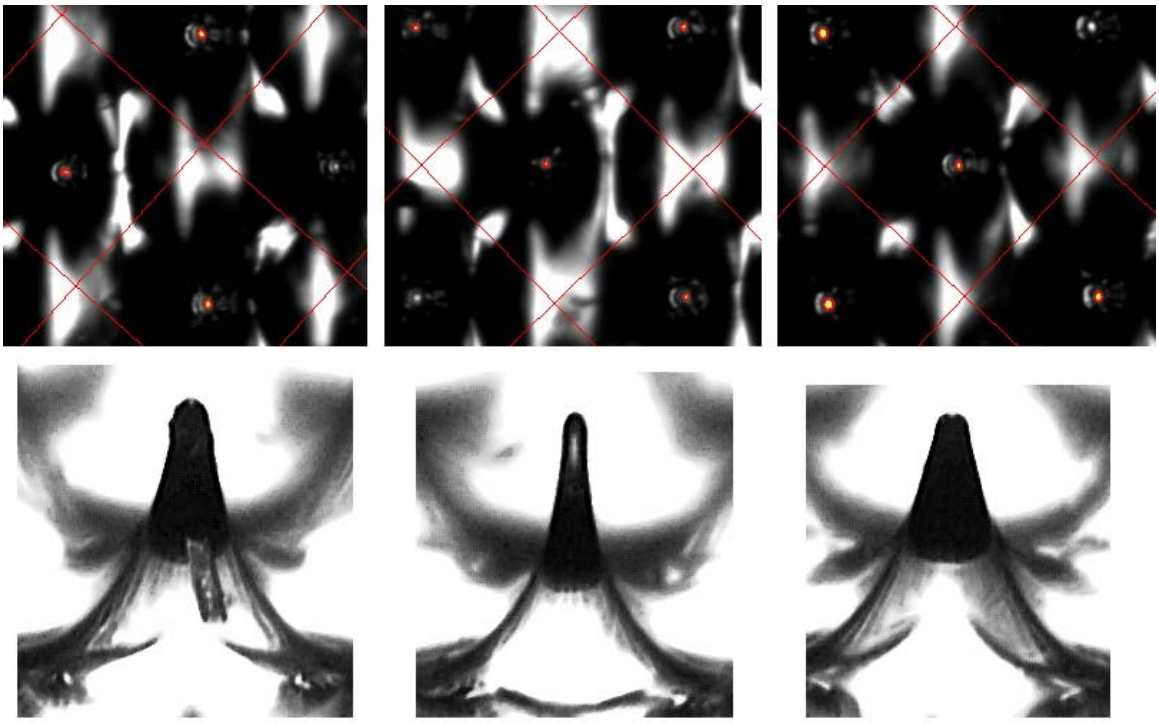

Figure 3: top view of minimum dot vs.
3D view of the same dot

Looking at the dot shape lets us understand immediately that the dots are not the same, even though the view from top would lead us to think that was the case. The dots differ in shape whilst having an almost identical printing surface. The dot in the middle of figure 3 is not necessarily worse than the other dots but it is different. A small dot might be more flexible and therefore less sensitive to pressures regarding the dot gain during print.
The plate material, the printing surface, the printing pressures, printing speed, ink, and many other parameters are the defining target to which dot should be considered to be the minimum dot to be used. At the end of the day it is important, that the minimum dot used for the cyan plate is of the same shape as the magenta and yellow plates. Having different minimum dots will result in different dot gain behavior therefore incorrect color casts and problems during the print. The FAG FLEX³PRO is used to capture the top view and the 3D image by a simple click of the mouse, without the need to re-position the plate.

In order to have an easy to understand function for checking the minimum dot, a Dot Structure Index has been created.
The dot structure is a measurement created for the dot shape and can be used to keep the dot shape of the minimum dot constant. It is calculated using the following formula:

*Index := Normalise [(Diameter_minus10+Diameter_minus30+Diameter_minus60) * (Diameter_minus60-Diameter_minus10)/ 50microns]]*

The smaller and the steeper the dot is, the lower the Dot Structure Index will be.

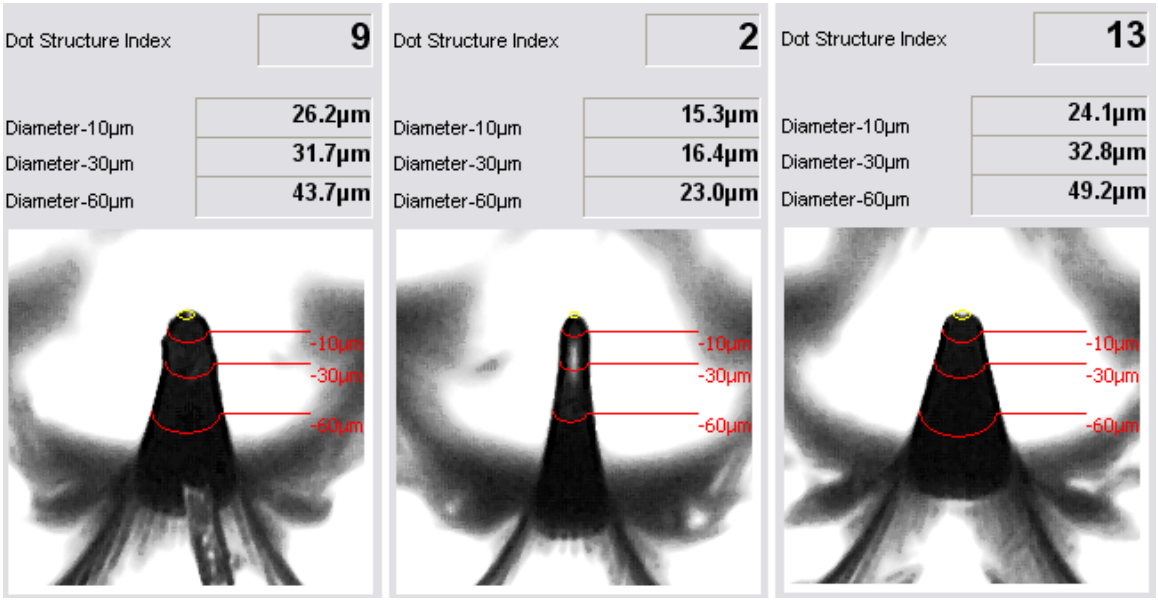

Figure 4: The Dot Structure Index

It must be decided if the minimum dot is reliable enough to print throughout the entire run of the job, it may break during cleaning or printing and create a void or bend and print as a line, A print test will not always give you the complete answer as the test form typically is printed on short runs only. A 3D visual check of the plate will help to forecast the reliability of the dot. If the top of the dot is too steep and not supported by surrounding dots, it can easily enter partially the Anilox cell and be broken (see figure 5).


Figure 5: a small dot with steep top

The FAG FLEX³PRO Plate reader is offering the Flexo plate maker and printer a totally new, easy to use and affordable way to take the next important step in quality control.

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Checking is very quick, by comparing any two images or by using the 3D picture of the dot thus making the analysis straight forward and correction faster, all achieved easily with a simple click of the mouse.

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