

The Pressroom

By Dan Remaley

We made it! Final destination, the pressroom. I hope we didn't lose anyone! The pressroom is the ultimate customer of scanning and pre-press. The measurement and control of these variables are paramount for process control in the pressroom. In theory, we are at the last device, in reality - it's the first! We must first know the print conditions of the press before scanning, proofing, and platemaking can be accurate. Fortunately, we have some specifications like SWOP and GRACoL to guide us.

We'll deal with film generated plates then Computer To Plate issues. We'll believe that everything has been accurate in pre-press, now with good plates, we're ready to print. Our machine specific, press settings, should be checked and measured. With new blankets we should run a PIA/GATF test form. This form should be evaluated and measured against the SWOP or GRACoL numbers for density, dot gain, gray balance, print contrast, etc. Any mechanical problems will show on the test forms diagnostic elements, and should be corrected immediately. Hopefully, the press prints within specification, if not, you may need a PIA/GATF consultant to help with this evaluation.

Solid ink density is the measurement of a solid printed patch on the paper, including the paper density. It generally relates to ink film thickness, however, a higher 'pigment load' ink will measure the same density at a 'thinner' ink film thickness, this helps in controlling dot gain while meeting density requirements.

Dot gain is the measurement of the increase in tone value (TVI) from original file to the printed sheet. An imaged piece of film will measure 50%, after plating it becomes 54-58%. When printed it becomes 70% which includes all these steps. Have you heard that Computer To Plate (CTP) prints 'sharper'? It does, but why? The main reason is that we make the plates linear (similar to the imagesetter) but their isn't that 4-8% 'bump' from the traditional platemaking. Be aware that you may need to add 'weight' to the CTP system to match images that printed fine in the past. On the other hand, if you printed with too much gain in the past, CTP will help your print condition. Beware that CTP can 'mask' problems present in the pressroom.

The density values include paper and are 'Status T' response.

At press we need a good densitometer, one that reads density, dot gain, gray balance and print contrast. These measurements are used to establish the printing condition and its relationship to SWOP/GRACoL or the proof. In all pre-press areas I have described the importance of gray balance control, now we need to measure it at press.

The first method is to use the densitometer to measure the density of the midtone 3/color build (50C/40M/40Y). Set the densitometer to read "ALL" filters and measure the density. The overall density should be around .60 (+/- .05). Now go through the color channels and record the density of each color C-M-Y these measurements are the corresponding Red-Green-Blue filter readings. When the RGB numbers are the same, you are neutral in color! If the numbers are higher than desired, but equal, we have a 'darker' gray. If the numbers are lower than desired, but equal, we are lighter gray. If any of the numbers are spread by .03 the color will be 'casted' in that direction.

The second method is to measure patches of 50% as dot gain. The procedure is to set the densitometer to measure dot area or dot gain. The procedure is zero out the paper, then measure the solid patch, then the 50% tint. The result will be 'dot gain', a value of increase from the 50% patch (i.e. 20%). If we measure as 'dot area' the value would read 70%. When these values are correct, gray balance will be achieved and appear gray. One other measurement is Print Contrast, this measurement is the difference between the solid ink density and a 75% tint. The contrast reference is a measurement of print quality. When the percentage drops, the 75% patch begins to fill in and plug, showing poor print quality.

All of this applies if the scanning and proofing are controlled, if not, the pressman makes adjustments to the solid ink density to 'match' a proof or sample. The increase or decrease in density reflects a change in dot gain, more ink, more gain – less ink, less gain.

By printing to a standard (SWOP) we can define the print condition and pre-press can adjust for a stable and controlled process.

NOTE: these are the 'old values'. SWOP and GRACoL are in the process of re-establishing the specifications and tolerances using the new G7 methodology based on gray balance and colorimetric values. I include this data for printers that are printing four color work on a two color press. These are good 'starting' numbers.

Old SWOP has the following value and tolerance-

Cyan	1.30	20% gain	40% Print contrast
Magenta	1.40	20% gain	40% Print Contrast
Yellow	1.00	18% gain	35% Print Contrast
Black	1.70	22% gain	40% Print Contrast

Density Tolerance +/- .10 Dot gain tolerance +/- 3% Print Contrast +/- .5%

Now that we realize the tolerances required and can measure the standard deviation of the press, we can help the pressroom by using GCR in scanning. The use of GCR will allow for a wider deviation of the press without 'changing' the color at press. The concept is to remove the graying component of the Y-M-C values and replace with black. This process reduces the size of the 3/color dots and increases the value of the black dots. This reduced size of Y-M-C dots allows the press to increase or decrease dot gain without changing the color on press. The only concern is the black printer, if printed to 'heavy' the color will be darker and muddy. (see color separation article)

Today's hot topic is color management. The idea is to measure each device and 'profile' it's color space. By attaching this profile to the file the next device can interpret the desired color. In order to do this correctly we need to print an IT.8 target or the new ECI target, on press at the correct density, dot gain, print contrast and gray balance. This data, through software can be used in the proofing and scanner to match the established print condition. It absolutely cannot happen without process control! Without defined measurement procedures and controlled tolerances color management will fail.

Any questions or comments, please call. Thank you for the opportunity to share this series of articles with you. I hope we have helped your process control methods.

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