Printing to Gray Balance. . . .

Most recently there has been a lot of discussion about "printing to gray balance". The new GRACoL (G7) describes the methods to achieve gray balance at press.

What's so important about gray balance at press?

The concept of gray balance is essential for excellent color reproduction in scanning, proofing, and in the pressroom. In scanning, images that are not in gray balance are considered "casted." Images that are casted show a magenta, cyan, or yellow (or combinations of M-C-Y) color appearance in the highlights, midtones, and/or shadows. Casted images require color correction to remove the unwanted colors. Images that are in gray balance only need to be adjusted for specific areas of color enhancement, i.e. greener grass, or bluer skies.

Proofing systems must be able to reproduce neutral gray without any cast as well. If the file is correct and the proofer introduces a cast, then all the color is shifted away from gray balance. A proof that is casted will require the press to print away from neutral gray to match the proof.

The little "secret" of process color printing at press is that you can only print two ways on press - in gray balance or casted - that's it! You are either neutral throughout the tone scale, or you are casted in some way. If you're casted, color reproduction suffers.

The fact is that all press operators abide by this principal. Press operators look at a printed press sheet and notice casts of too much magenta, cyan, or yellow and reduce whichever color is creating the cast. The control for the press operator is more or less ink, however the TVI, or dot area, is equally important. The press operator can't change the size of the dots on the plate, but he or she can change the gain by adding or subtracting ink.

The major problem in printing today is that the values on the plate are incorrect. The values on the plate need to be adjusted for all four colors, each color Y-M-C-K, needs its own plate curve to reproduce neutral gray at press. A lot of printers have only one plate curve for all colors! The other issue is weight - how dark or light is your midtone reproduction? Screen builds and Photoshop images are adjusted for around a 20% TVI, or midtone gain, meaning a 50% patch will print as a 70% value. Most linear plates (50% = 50%), gain around 14 to16% on press, and print too light for separations created in Photoshop.

The majority of printing plants I encounter have this platemaking problem. It is impossible for the pressroom to control gray balance and color with the wrong size dots on the plates. The procedure is to print a test form with complete tone scales at the required density.

Next, compare the scales against a standard and adjust the plate values accordingly. Every color bar should include a three-color gray patch represented by 50C-40M-40Y. This patch, when printed at the correct density and dot gain, will appear neutral - without any casts. It can also be measured with a reflection densitometer. The densitometer needs to be set for "ALL" filter readings, now the yellow, magenta, and cyan inks can be measured as a density. When all three filter readings are equal, the patch is neutral. A 0.03 density among all three filter readings is the tolerance for an acceptable neutral appearance.

If you have any questions, or would like me to help you on-site, please call me here at PIA/GATF. I'll include my personal cell phone number as well.

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