

Color Reproduction – Best Practices

By Dan Remaley PIA/GATF, Process Control Manager

Introduction-

Over the last 30 years I have worked in color lithography. Working as a camera operator, color stripper, press operator, production manager, and plant manager. For 14 years I worked at high quality color separation house., My duties included going on press checks to confirm that my proof's would match the press. You know the common statement when the proofs don't match the press, "it must be 'bad' film or proof"! This 'Dirty Harry' position helped me to understand the entire printing process, from scanning, proofing, platemaking and press. What an experience! I have often looked for a book explaining the entire process with measurement controls, to no avail. I could only find individual topics without continuity. I hope this series of articles helps explain the process in general terms.

Through process control measurements we can define where the problem lies. The last 8 years I have worked at GATF as a process control specialist. Currently, I manufacture all the color bars, test forms, and plate control targets for the printing industry to exact specifications. I also present seminars on Process Control at the PIA (Printing Industries of America) affiliates and throughout North America. I also present a Process Control Boot Camp, here at GATF twice a year. I will share these experiences and questions with you in these articles.

The foundation of printing process color is with process control, even color management will not work without excellent process control. What are we measuring? Do we measure films, proofs, plates, dot gain, gray balance, print contrast? If so, what are our standards, tolerances or targets?

The control of process color printing is very complex with many variables. My intent of this series of articles is to convey the information necessary to produce quality color printing through measurement, calibration and process control. We will look at every department, scanning, proofing, platemaking and press. The common theme will be what, and how are we measuring this color reproduction system.

Let's begin with the discussion of color. It's certainly subjective! Different people 'see' color differently. Some people are more sensitive in gray's, some in red's, some in blue's. Usually, people who work around color printing pay close attention to neutral's. There is good reason for this, when images are in balance they are neutral throughout the tonal scale. If they are 'out of balance', they are quantified as 'casted', toward Magenta, Cyan, or Yellow. If you look at a Lab CMC color tolerance chart, the elliptical shapes represent the measurable Delta differences in lightness, hue and saturation. The smallest ones are in the neutral gray region.

When viewing color we should be in an area that simulates 5,000K, GATF makes a small metameric strip that shows 'stripes' if it's not 5000K. When I was the plant manager at the color trade shop we placed one of these strips on every proof that was sent out, to confirm their viewing condition. It is really important to have the correct lighting condition for the viewing color proofs and originals. I can remember working all evening to color correct an advertisers 4/color proof. When the new proof was made it looked great! The following morning at 9:00 am the agency called and said the flesh

tones were way to 'red'. I realized he was viewing this proof under the morning sunlight, which is 'warmer' than our viewing conditions. He agreed the color was OK after viewing it under 5000K controlled lighting.

It is imperative that we standardize the printing process, we need a target, a guideline. Lithography has SWOP, GRACoL and newsprint has SNAP, these guidelines help us define our process control and establish acceptable tolerances.

In scanning for example, how can we convert the original, print or digital, to the printing process without knowledge of the color reproduction system, proof and or press? When we proof the image, do we have something to measure? A color bar, a GATF Proof Comparator, something, anything? Typically not! The proof only contains the color image. Was the proof made correctly? Was it made to specification? Was it made to match our print condition?! This is the biggest problem in the industry today, proofs are made without any process control element. Proofs come from everywhere, laser printers, dye sub printers and ink jet technology. Some of these systems can be profiled to match your print condition but other's cannot. How do you know? I recommend placing a GATF Proof Comparator on every proof and measure any changes from proof to proof in Lab color space or with a densitometer.

In platemaking we control the size of the printing dot. Prior to computer to plate, we never actually measured the size of the dot on the printing plate. We measured the film output and controlled the dot size through calibration. Now we have the tools to measure and calibrate the plate .

The press is still the largest variable. Ink, water, paper, blankets, pressures, temperature, humidity all impact the print quality. Newsprint has its 'special' set of circumstances, including printing without room for a color bar, or any measurement device!

In the following articles we will investigate each of these areas in detail, scanning, proofing, platemaking and press work. We'll discuss the use of GCR, color management, digital capture, all part of the manufacturing process. If you have any comments, questions, or private inquiry please contact me at –

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* If you send me your e-mail address, I'll forward you the PDF of my Process Control Reference guide.