



Why You Should Employ G7™; the New Proof-to-Print Process

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G7™, the new IDEAlliance Proof-to-Print Process provides an easy to follow recipe for implementing ISO printing standards and adds modern metrics to enable an efficient way to match visual images from proof to press. G7 is named for its gray scale calibration technique (“G”) and the 7 ISO ink colors it requires. G7 is a trademark of IDEAlliance. Although G7 was developed by the efforts of the GRACoL Committee, it should not be confused with GRACoL or with GRACoL 7.

Origins of the G7 Process

In 2004, the IDEAlliance (International Digital Enterprise Alliance) GRACoL® (General Requirements and Applications for Commercial Offset Lithography) Committee, published a characterization data set, based on a sheetfed offset press run, that the committee believed represented good commercial printing on a #1 coated sheet for commercial printing. Almost immediately this data set was deemed to be unacceptable by the printing community. When the GRACoL Committee went back to the drawing board its next attempt to define specifications for commercial printing took a radical turn that even today has printers and the print-buying community abuzz. Their development of a radical, new proofing and printing methodology grew out of a demand from the print-buying community for a closer “visual” match between proofs and the final printed product. The effort was guided, in part, by one of its co-chairs, Anthony Bellacicco, then Director of Prepress Services, Foote Cone & Belding, New York. Anthony strongly advocated developing not only new aims for commercial printing, but a new process that would assure him of a closer visual match between the vision of the creative and the finished product on press.

The GRACoL team was rounded out by its chair, Don Hutcheson, a leading color management consultant and Gerry Gerlach, a printer and former scanner and digital photographer. This team lead a series of 19 research press runs to refine the G7™ Proof-to-Print Process and to develop a characterization data set for commercial printing on a #1 coated sheet that will be published as GRACoL 7.

GRACoL® and G7™ are not Standards

It is important to note that works published and promoted by the IDEAlliance GRACoL Committee are not standards. This work was never intended to compete with existing printing standards and, in fact, is built upon and relies upon ISO printing standards. For example, the use of ISO inks is critical to the process. ISO is the International Standards Organization governing all industries including printing. ISO 12647-2 is a

standard for "Graphic technology - Process control for the production of half-tone color separations, proof and production prints - Part 2: Offset lithographic processes". ISO 12647-2 is remarkably valid today, but its reliance on a small number of solid ink colors and TVI (Tonal Value Increase or dot gain) curves limits along with the lack of a colorimetric definition for gray balance limit its value in controlling the visual appearance of an image. Today's users want a way to define the 'appearance' of the final image more precisely than is guaranteed with ISO 12647-2. This is where GRACoL's G7 Proof-to-Print Process comes in.

According to David Steinhardt, President of IDEAlliance, "The GRACoL Committee is not attempting to create new standards but instead utilizes existing ISO Standards as the basis for good printing. G7 requires ISO 2846-1 inks and is an implementation of a legal subset of ISO 12647-2 printing standard with further limiting metrics, methods and characterization data."

Why all the Controversy?

Many of the principles behind the G7 Process have been found controversial by the traditional printing community. Because G7 is intended to provide a closer visual match between proofs and the final printed product and between printed output from press to press, they are seen as radical and foreign. In addition the G7 process makes use of new technologies that can help us control the appearance of visual images more efficiently than methods used a generation before. Hence G7 is not only controversial but is sometimes seen as a threat to traditional printing methods.

The new G7 process was developed during a series of 19 press runs conducted during 2004 and 2005 on sheetfed offset presses. Through these press runs the G7 process, based on principles of digital imaging, spectrophotometry, and computer-to-plate (CtP) technologies, was refined. The G7 process differs from traditional proofing and printing calibration methods in a number of significant ways:

- G7 relies on measuring color with a spectrophotometer rather than measuring the thickness of dots of ink on paper using only a densitometer. GRACoL's research indicates that the measurement of dots of ink on paper is not the best basis producing a consistent visual appearance from device to device. G7 breaks from tradition by focusing on colorimetric data rather than on densitometric aims, i.e. dot gain, for each color.
- G7 hypothesizes that visual appearance, how an image looks to the eye, is best controlled by gray tones from the shadows to the highlights than by measuring dots of ink on paper. G7 breaks from tradition by focusing gray balance in the mid-tones rather than dot gain, for each color. G7 adds a formal definition for gray balance and introduces the concept of a Neutral Print Density Curve (NPDC) for the 3-tone gray and black as limiting metrics to those defined by ISO 12647-2. G7 relegates measurement and control of dot gain to a process control for proper press performance rather than for determining the image appearance.
- With G7 we use detailed spectrophotometric analysis of multi-tone gray scales to compare the natural curves of a press or proofing system to the ideal aims for that type of printing. We then correct the curves in the CtP RIP to force the press to recreate the visual appearance of the image as closely as is possible. G7 breaks from tradition by using the power of CtP to help control visual appearance of the printed image.

According to Anthony Bellacicco, "After witnessing the GRACoL press run at Sandy Alexander and the latest press run at Integrity Graphics, the results are promising. The methodology makes sense and the process works. Say good-bye to measuring dot gain

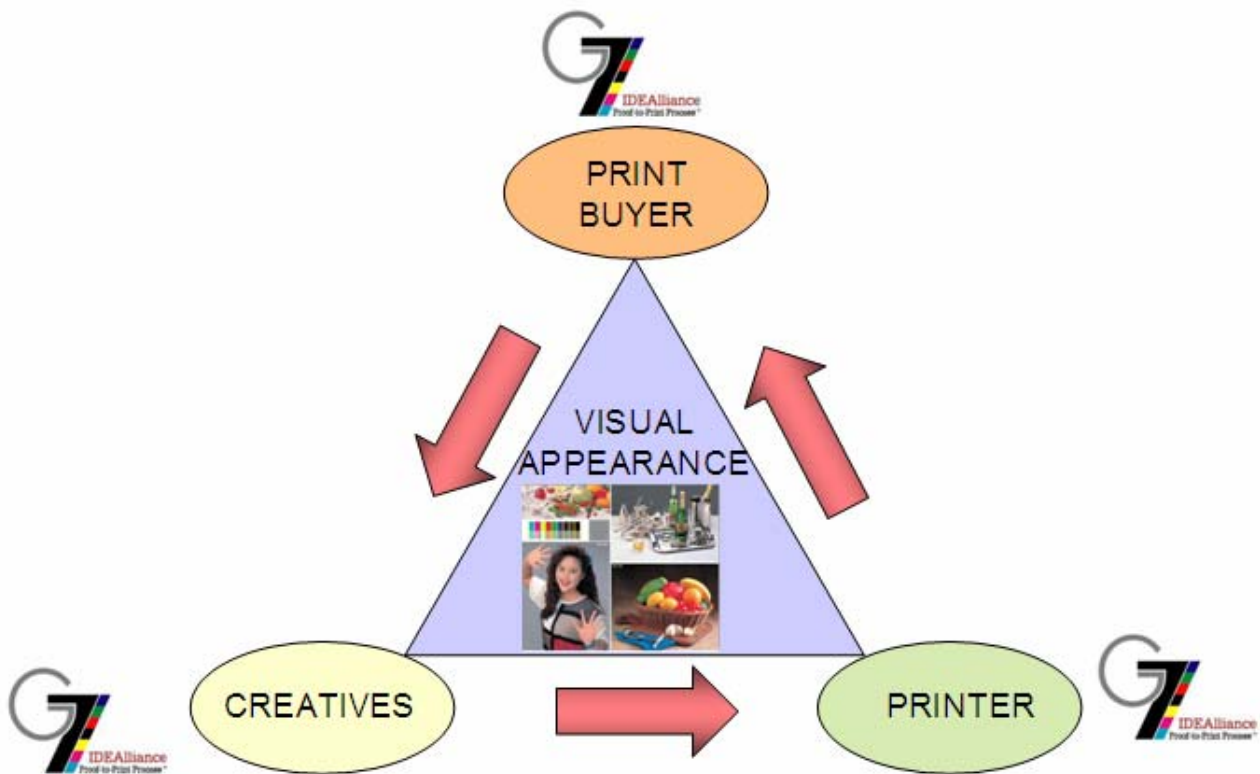
and hello to measuring gray balance. Both printers made an organized program appear effortless." And Victor LaValla, COO of Integrity Graphics added, "The more we learn about color -- the more black and white it becomes. The colors we see all become shades of gray."

Of course achieving gray balance and matching the black and 3-tone gray curves from the highlights to the shadows is a critical first step of matching visual appearance, the second stage uses ICC (International Color Consortium) profiles or similar color management to optimize the match to a reference characterization data based on ISO-standard print conditions or the new characterization data sets developed by GRACoL and SWOP.

Because G7 process is based on colorimetry and adds new metrics to control the factors that determine how images appear to the eye, this process can be applied to many diverse printing types. G7 is currently being applied to commercial and publication printing, newsprint and even to packaging. The IDEAlliance GRACoL and SWOP Committees recommend that G7 be used as the basis for proofing and good publication printing. Tests have also been conducted for newsprint and flexo and the packaging printers have adopted the G7 as a basis for good printing as well. Being able to use the G7 process controls for different printing types is attractive to print buyers who want a similar visual appearance from magazine ads to sheet fed brochures to packaging in order to maintain brand identity.

Why Employ G7?

Employing G7 provides benefits to using G7 for both creatives and printers. And the benefits of G7 for print buyers are quickly making G7 a critical print buying requirement. G7 creates a "closed loop" for visual appearance from conception to print.



G7 Benefits for Printers

The major benefit for printers of using G7 is that this calibration and process control method seems to make the printer's job easier. G7 specifies a simple calibration process that helps the printers reliably achieve a close "visual match" from proof to press. Once presses have been calibrated and correction values applied in the RIP, the press can be forced to reproduce visual images that match as closely as is possible, given the variation of pressroom conditions. Reports from printers indicate that when plates are made, matching the proof to the press takes less time and fewer plate makeovers are required. According to printers using this process this means faster make readies and happier customers.

Because G7 enables printers to use the CtP process to force a press to reproduce visual images with a very similar visual appearance, G7 also enables printers to split jobs across printing devices or even across locations. Printing to the numbers with G7 means printers can use different equipment, even in different locations, to print materials that look quite similar to the human eye. Reports indicate jobs split across an old piece of equipment and a new one produce pages that look so much alike that no one can tell which sheet came from which press.

Benefits for Those Producing Proofs

Chasing the proof on press has always been a problem. The "disconnect" between those producing proofs and those printing the final output has long been troublesome, not to mention time consuming and expensive. Color management with ICC profiles by both the agency and the printer has lessened this disconnect, but the problem still remains. G7, the "Proof-to-Print" Process was developed to bridge the final gap between prepress and printers so that the visual appearance of the proof can easily and reliably be reproduced on press. G7 is all about establishing a closed loop for visual appearance from print buyer to the agency to the press.

The benefit of G7 to agencies and prepress service providers is two fold. First is the ability to match proofs on the different proofing systems within the agency. It is common for an agency or prepress house to have a variety of different proofing systems. And it is equally common that even with careful calibration and use of ICC profiles, the proofs from different systems still look significantly different. If agencies can't match proofs from one proofing system to another, how can they have any hope of matching the press to the proofs? The answer is G7! By adding G7 into the mix to control gray balance from the highlights to the shadows, agencies can bring the visual appearance in line across proofing systems.

Of course the second step is to produce a proof that can easily be matched on press. If proofs are produced in a color managed environment and G7 is applied to control the neutral print density curves, and if the printer likewise employs color management along with G7, we have closed the loop of factors determining visual appearance. G7 enables agencies to be confident that customers who approved a proof will be equally happy with the final printed product, no matter what the type of printing.

Benefits for Print Buyers

While the benefits to agencies and printers are drivers for G7 adoption, the biggest driver comes from the print buyer community. Print buying has changed and buyers are struggling to meet new challenges. G7 can help print buyers meet the challenges.

Always a challenge for print buyers is the ability to maintain brand identity when buying across print media types. The assurance of maintaining brand imaging from advertising, to sales collateral to packaging is critical. G7 solves this problem by

enabling printers to achieve a similar visual appearance across a broad range of printing types. Basing print buying decisions upon the G7 process provides the benefit of maintaining branding no matter what the type of print.

Another advantage G7 provides to print buyers is the ability to purchase globally yet assure a common visual appearance. In order to truly take advantage of global buys, the print buyer must have confidence that a piece printed locally, in Europe and in Asia will maintain the intended visual appearance. The quality assurance that G7 provides means that print buyers can take advantage of global buying opportunities.

Because G7 closes the loop on visual appearance, it makes life easier for every partner in the print supply chain. This benefit to the print buyer can be priceless.

Building G7 Expertise

To date the IDEAlliance G7 Expert training program has trained press room and color consultants from Asia, Australia, North America, Latin America and Europe. In turn these consultants are working with agencies, prepress houses and printers to qualify them to the new G7 process control and printing methods. Programs like the one presented by Margie Dana, at the Boston Print Buyers meeting this spring, are helping print buyers learn more about G7 and why that should be on every print buyers checklist.

You can learn more about the new G7 Proof-to-Print Process at www.gracol.org. You can employ a G7 Expert Consultant at www.gracol.org/experts. And you can find agencies, prepress houses and printers who use G7 at www.idealliance.org/g7masters/.

* G7 is a trademark of IDEAlliance (www.idealliance.org)