

THE FOUR PRIMARY BENEFITS OF G7 TO THE SCREEN-PRINTER

Mike Ruff discusses the advantages of working to a standard



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Before 2005, the sheet-fed offset and the web-offset print community world-wide worked from international standards that produced very good results if a printer took them seriously and

applied them diligently. Print standards were based on the ISO 12647 print standard series. 12647-1 set forth the parameters and measurement methods of the print standard families and then the ISO Print Standards added special requirements for different print technologies. They then were separated by a dash + a number. For example:

ISO 12647-1: 2004 = Graphic technology – Process control for the production of half-tone colour separations, proof and production prints – Part 1: Parameters and measurement methods

- ISO 12647-2 = Offset lithographic processes
- ISO 12647-3 = Coldset offset lithography on newsprint
- ISO 12647-4 = Publication gravure printing
- ISO 12647-5 = Screen-printing
- ISO 12647-6 = Flexographic printing
- ISO 12647-7 = Off-press proofing processes working directly from digital data
- ISO 12647-8 = Validation print processes working directly from digital data

THE 2005 BREAKTHROUGH

In 2005 a small group from the IDEAlliance Print Properties & Colorimetric Council took note of a common weakness of the print standards that were currently in use. The weakness was that, if all elements of the standard were followed, there was still a high likelihood that the result would not be the same from printer to printer and job to job. The reason was that colour was being specified and controlled by 'non-colorimetric' measurements we call TVI (dot gain) and density, (the amount of light reflected back to a densitometer that indicated the 'strength' of a primary colour.)

Don Hutcheson of HutchColor LLC had been using a neutral grey calibration technique to neutralise non-standard inks and substrates for years. The Print Properties Pioneers were encouraged by Hutcheson to

test a colorimetric method of print calibration on multiple presses at multiple locations and evaluate the feasibility of this, solving the print variation that was not corrected by TVI. He freely shared his technique with the print properties committee and then with the world. Although it was not called G7 at first, G7 was born.

"G7 delivers a known arrival point at the press that a printer can print to in confidence and a production manager can defend that arrival point"

NOT A REPLACEMENT FOR ISO STANDARDS

The technique and procedures of G7 were not designed nor were they ever promoted as eliminating the need to use the parameters and measurement methods of the 12647 family; but it was obvious that G7 was a needed next-step in improving accuracy and productivity by adjusting TVI through the use of a spectrophotometer and colorimetric aim points. The unique formula and neutral grey

calibration methodology is now an ANSI Print Standard in TR015 and is referenced in CGATS.21-1 and CGATS.21-2 and is moving into ISO Standards as an accepted method to calibrate to neutral grey.

WHAT CHALLENGES OF SCREEN-PRINTING ARE BEING SOLVED BY G7?

The production of four-colour process in screen-printing is challenged by five very unique characteristics of our trade.

- 1 Print designers of process colour printing are not using the characterisation data sets that align with screen-printing.
- 2 We print with non-standard inks.
- 3 Most substrates we print on are not paper but durable substrates and mostly plastics. These substrates are not normally compliant to the print designers' assumptions.
- 4 The transparency of our ink is very different from other print technologies.
- 5 Screen-printers are challenged to match proofs produced for and by the most common print technology, ISO 12647-2 offset lithographic processes.



Printer A Result



Printer B Result

A print buyer sends the same file to two different print providers. Printer A prints the one on the left. Printer B's results are on the right. Who is correct to the file?

ANSWER: You don't know. The correct file could be the right or the left. However, if the printer prints to neutral, they are confident that they are printing accurately.

Figure 1: This image is an example of the challenges and the importance of knowing that you have printed the image accurately

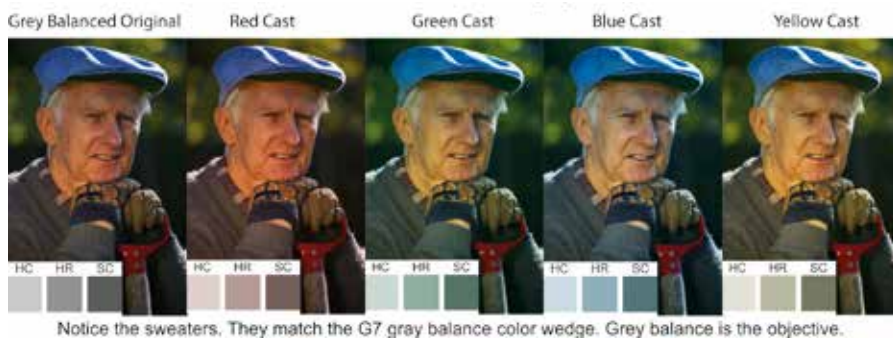


Figure 2: Correct grey balance image and four images with a colour cast

G7 IN SCREEN-PRINTING AND WIDE-FORMAT INK-JET PRODUCTION

I taught the ISO methodology for many years at SGIA's Screen Print 4-Colour Process Control class. We would explain to the classes that the objective in four-colour process printing was to print to a specified TVI (dot percentage) and use ink that was targeted to a specific density, and the colour result would be as close as possible to a common accurate proof excluding the effect of the substrate and ink colour. This was true but there was a flaw in the system that G7 would soon fill.

In 2006 I was reading about Don Hutcheson and the G7 Pioneers testing a dynamic grey balance formula that produced a 'common visual appearance' on different substrates and even non-standard inks. I knew before I put the magazine down that this was the missing link that would drive productivity forward in the graphic screen-printing industry. I signed up for the training and started implementing G7 in the US screen-printing industry immediately. Johnny Shell, Jeff Burton and Mike Robertson of SGIA recognised the value and benefits and supported my efforts. The result was screen-printers could now deal with different ink and substrate challenges and produce a 'common visual appearance' by implementing the simple methodology of colorimetric grey balance through G7.

Don Hutcheson encouraged our efforts and Joe Fazzi of IDEAlliance realised screen-printing and wide-format digital were now ready to become a part of the G7 community. The rest is history and the history has now expanded to wide-format ink-jet, dye-sublimation and any other process colour imaging that is produced using the CMYK production process.

Now on a weekly basis I am asked what are the benefits of G7. There are many benefits of G7 and the list below is certainly not exclusive but I feel there are four primary benefits that are common to all G7 Qualified Master Printers.

BENEFIT 1: PRODUCTIVITY

The primary killer of productivity in the production of process colour is colour adjustments on-press. The in-line press didn't make it better; it just allowed us to make unnecessary colour moves faster. The clients were even invited to stand at the end of the

press and adjust their masterpiece in real time and our profits slipped away as they stood in incorrect lighting and made subjective colour moves.

G7 has not eliminated this entire problem but well trained print providers now are able to show a client they are in balance on the press and the print is as accurate as possible on the substrate they are printing through G7 compliant colour bars. G7 delivers a known arrival point at the press that a printer can print to in confidence and a production manager can defend that arrival point. The ability to know that a print is in grey balance drives productivity and eliminates much of the subjective colour tweaking.

BENEFIT 2: ACCURACY TO THE FILE

Accurate to what? This is a difficult question to answer in today's printing environment but the absolute truth is the file is our God. The trend now is to send a file and no hard proof. Since we do get a hard proof most of the time, we don't really know if our prints are accurate to what the customer wants so we now have to revert to being accurate to the file. After pre-flight standardisation is complete. G7 print methodologies have provided screen-print and ink-jet digital printers a point of reference that at least establishes a measureable point of accuracy – colorimetric neutral grey balance. Figure 1 shows the same image but two very different print results.

If a client sent you this file and you printed the print on the left and another printer printed the one on the right, who is accurate to the file? The accuracy metric that G7 provides is that if your press or printer is printing to neutral, you have not added any unwanted colour cast to the file (Figure 2). You are probably as accurate as possible to the file you have printed. A G7 bonus is you can prove it by measuring the neutral grey colour bars. This does not mean the customer will not want to adjust to colour or ensure that they will like the result; but it means there is now a high likelihood that they will accept this logical and accurate result. This is something that we have never been able to accomplish before using G7 methodologies and it has made many printers much more profitable and the client happier.

BENEFIT 3: CUSTOMER DEMANDS

G7 methodologies are now being driven by print buyers. The challenge of time to market and increasing shipping cost has created an opportunity for print buyers of major national and international retailers to use G7 Master Printers in different areas of the country or even the world. The reason they could not do this previously with confidence was that different printers used different ink colours and printed on different substrates. TVI and Density created good-looking prints but did not have a common visual appearance unless ink, substrate, colour sequence, overprint transparency and TVI were matched perfectly. (Whew!) That never happens printer-to-printer. Print buyers know that G7 Master Printers print with the same calibration aim points that are colorimetrically adjusted to a NPDC (Neutral Print Density Curve). This provides a common visual appearance world-wide regardless of substrate and ink challenges that are common to screen-printing and wide-format digital ink-jet printing.

BENEFIT 4: INTERNATIONAL COMPLIANCE

ANSI CGATS 21-1 and 2 are now print standards and are based on G7 methodologies. ISO standards are now being written or modified to include the 'Neutral Print Density Colorimetric Aim Points' established by G7. ISO 10128 provides the option for using the G7 based grey balance procedure. New print standards like ISO 15339-1 and -2 provide the grey balance formulae for G7 tonality and colorimetric grey balance as well as 7 CRPC (Characterised Reference Print Conditions) that are all grey balanced using the G7 principles. ISO 12647-7 Proofing from digital data has grey balance control patches that allow the proof to be G7 Compliant. ISO 12647-5 has removed TVI and density requirements and is now a colorimetric standard. Wide-format ink-jet standards are common colorimetric aim points. This means that if you are a G7 Master Printer you should be able to easily comply with these new ISO standards as they evolve.

CONCLUSION

The four primary benefits of G7 in screen-print and ink-jet digital printing are internal and external. They help move production to a new level. It gives printers and customers confidence in a visually acceptable result without blaming the substrate. It will drive quality and profitability to a new level. My advice is to get on this train as soon as possible. ■

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