



Printer's Guide to G7®

IMPLEMENTING G7 CALIBRATION FOR YOUR PRESS

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ABOUT THIS GUIDE

G7 has been a key part of the standardization of printing around the world, helping companies to become more efficient and make better use of their manufacturing process. This guide presents background information about G7, as well as technical details on performing calibration. For Techkon SpectroDens users, there is a section at the end that highlights specific instrument features that can make G7 implementation easier.

INTRODUCTION

G7 has had a revolutionary impact on how printing is done in North America, as well as other regions. The term is used every day in the world of print to refer to an expected print condition. G7 was invented by Don Hutcheson out of a need for a simple and effective way to calibrate CMYK devices. He noticed that photographers had used gray scales for image calibration for more than 100 years. Don used this as a basis and created methods and aim points for G7 that we use today when performing a calibration, or assessing a print. Unlike other print specifications which rely primarily on dot gain, G7 is a colorimetric specification that has been mathematically formalized in CGATS TR015.

G7 has precise definitions with several key elements:

- G7 is a specification for gray scale appearance and applicable to any CMYK printing process
- G7 defines two elements, tonality and gray balance
- Tonality represents the weight of the CMY and K curves, and is referred to in G7 as Neutral Print Density. Tonality in G7 can be defined by density or LAB values.
- Gray balance represents how gray should appear to the human eye. In G7 it is defined in terms of CIELAB a^* and b^* values.
- In addition to being a specification, G7 also is a calibration method that can be used to calibrate any CMYK device.

One of the most valuable things about G7 is its applicability to any CMYK printing system. When used across multiple systems, each can produce a result visually similar to the others, even if they are completely different print processes

1. Why use G7?

One of the most valuable things about G7 is its applicability to any CMYK printing system. When used across multiple systems, each can produce a result visually similar to the others, even if they are completely different print processes. This is often referred to as common visual appearance. For example a plastic bag produced using G7, and a folding carton produced using G7 will have similar tonality and gray balance. This means a brand or print buyer can have one proof and have similar results across many printing methods and locations. It is the common G7 tonality and gray balance that achieves this. This common visual appearance was very difficult to achieve prior to G7 and required many different proofs and sets of color corrections. Traditional print calibration methods have relied on TVI (tonal value increase) curves and do not work across multiple print processes. While the common visual appearance resulting from G7 is not perfect and cannot control all variables in color reproduction, the results are surprisingly good.

2. G7 and Paper

G7 is substrate relative. This means the color of the G7 gray adapts to the color of the substrate. For example, on a blue paper the gray will have a bluer target value or aim than it would on a yellow or neutral paper. There are no fixed values for the gray balance targets in G7 and, since it adapts to the substrate, the gray always looks natural. One of the really handy features of the Techkon SpectroDens is that it dynamically calculates and advises on these gray balance targets based on the color of the paper.

3. Key Metrics

G7 is based on color, not dot gain or density. We determine the correct color based on LAB measurements. So when we are working within G7 we need to have a good understanding of how to measure and evaluate LAB measurements.

The two main things we will be measuring with G7 will be:

- Gray balance, which is expressed as LAB values. (Gray balance is evaluated with a metric called weighted ΔCh .)
- Neutral print density (NPD), which is commonly expressed as density, but can also be expressed as LAB values. (NPDC is evaluated with a metric called ΔL .)

There are several patches that are used for G7 control and evaluation:

- HC  – The Highlight Contrast patch is made of C 25, M 19, Y 19
- HR  – The Highlight Range patch is made of C 50, M 40, Y 40. It is the most commonly used G7 patch for evaluation and process control.
- SC  – The Shadow Control patch is made of C75, M66, Y66

4. G7 Compliance Levels

There are 4 different levels of G7 Compliance that can be achieved. Which level depends on the type of printing you are doing and the precision needed.

1. *G7 Gray* is when G7 gray balance and tonality are achieved. For devices that cannot match the gamut of reference color space, G7 gray will provide basic common visual appearance. Examples of this may be a wide format printer or silk screen press than cannot achieve the gamut of GRACoL or SWOP.
2. *G7 Targeted* is when you achieve G7 Gray, and also match reference print condition primary solids within 5 ΔE , and overprints within 6 ΔE . An example of this would be matching GRACoL on a sheetfed-offset press.
3. *G7 Colorspace* is when you achieve G7 Gray, G7 Targeted, and a specific delta E average across the entire colorspace. Some offset presses can match this, but a more typical example would be an inkjet proofer.
4. *G7 Extreme* is essentially the same as G7 Gray, except that the colorspace must have a larger gamut than GRACoL.

All of the compliance levels above with the exception of G7 Extreme are recognized as compliance levels within the G7 Master program. More detailed information on these levels can be found in the [IDEAlliance G7 Master Pass/Fail document](#).

5. What about ISO GRACoL and SWOP?

Both GRACoL and SWOP are what is referred to as Reference Print Conditions. Print buyers and designers use these reference print conditions even when they don't know exactly what press or printing machine they are going to print on. There are additional reference print conditions based on G7 in CGATS 21 and ISO 15339. These are well-defined color spaces that, in addition to meeting G7 specifications, have complete characterization data sets including specification of reference paper color.

To target a G7 colorspace like GRACoL or SWOP we pay close attention to the color of solids and overprints, as well as gray balance and tonality. Additional details on how to do this appear later in this document in the calibration session.

Table showing G7 Colorspaces

Colorspace	Print method	Measurement method
GRACoL 2006	Sheetfed offset printing	M0
SWOP 3 2006	Web offset printing, 3 grade paper	M0
SWOP 5 2006	Web offset printing, 5 grade paper	M0
CGATS 21-2_CRPC1	Cold new offset printing	M1
CGATS 21-2_CRPC2	Heatset news offset printing	M1
GRACoL2013UNC_CRPC3	Uncoated sheetfed offset printing	M1
CGATS 21-2_CRPC4	Super calendared	M1
SWOP2013C3_CRPC5	Web offset offset printing	M1
GRACoL2013_CRPC6	Coated sheetfed offset printing	M1
CGATS 21-2_CRPC7	Expanded coated wide gamut printing	M1

ISO 12647 is a print standard used by printers around the world. Initially, G7 was intended to be in harmony with ISO 12647, and the G7 NPDC curves were averaged from multiple press tests using ISO standard paper and ink. If you compare GRACoL 2006 with other ISO 12647 implementations such as FOGRA 39 you will notice that the two reference print conditions are nearly identical.

In 2012 ANSI CGATS TR015 was published as a formalization of the G7 neutral print density and gray balance methodologies.

There are also additional print standards, developed in 2013, named CGATS 21 and ISO 15339. These contain a collection of TR015-based reference print conditions that range from newsprint to premium coated. Updated versions of GRACoL and SWOP are based on reference characterizations contained in CGATS 21 and ISO 15339.

G7 is how we calibrate to the print standards from CGATS 21 and ISO 15339.

- G7 is a valid method for calibrating to ISO 12647-2:2004
- CGATS TR015 is a standard that formalized the G7 method
- All of the datasets in CGATS 21 and ISO 15339 are based on G7

HOW TO PERFORM A G7 CALIBRATION

In this section we will go through how to perform a G7 calibration on a sheetfed offset press using a lookup-table (LUT) or curves.

1. Picking a Reference Print Condition

Before we begin to calibrate we need to pick our target reference print condition. That is because the color of the inks, the paper, and other materials are dependent on this print condition. For example GRACoL and SWOP contain LAB definitions of solids, overprints, and paper. For this guide we will be targeting GRACoL 2006. By calibrating to a reference print condition such as GRACoL we should be able to create a good proof to press match between the GRACoL proof and the press sheet. This compliance level is usually G7 Targeted, which means we will be achieving gray balance, tonality, ink solids and ink overprints.

If we do not care about matching a reference print condition and only want to achieve G7 then we do not need to worry about what ink and paper we have. In some cases if we know we have an ink or paper that cannot match an existing reference print condition we may just choose to only match G7. This calibration would be to the G7 Gray compliance level, and means we would only be achieving G7 gray balance and tonality.

2. Tools and Prerequisites

In order to perform the calibration there are prerequisites that we need to have on hand:

- Color and density measurement device for pressroom.
- Measurement device for plates.
- Inks capable of achieving ink solids and overprints specified in ISO 12647-2.
- Curve 3 software from Chromix. (You can also use fan graph method)
- Paper that is compliant with the reference print condition you are trying to match.

Optical brighteners have a negative effect on the validity of traditional M0 measurements, and thus affect the calibration.

3. Selecting Paper

The choice of paper is one of the most important choices you can make. If you are calibrating to GRACoL 2006 (and unless you are performing an M1 calibration such as GRACoL 2013) then make sure to avoid papers with excessive optical brighteners. The closer the paper color is to the target reference print condition, the closer your proof to press match will be. Even if you typically use brighter papers, for this calibration pick the closest match the reference print condition, and then at the end of the calibration you can tail in your normal production stock and make sure the proof to press match is acceptable. Optical brighteners have a negative effect on the validity of traditional M0 measurements, and thus affect the calibration.

4. Machine preparation

A press calibration is a moment in time. We need to make sure the press is in good mechanical condition. To do this make sure any major repairs or changes to the units are done before the calibration. Doing these types of changes after the calibration will often invalidate the calibration. Rollers should be striped, pressures adjusted, water checked. Blankets should be replaced a day or so prior to the calibration, and packing checked. Everything on the press needs to be checked and set to standard print conditions.

5. Documenting your Print Conditions

Because this press run is a moment in time, it is very important to document the print conditions. Use a [worksheet such as this one](#) to record these print conditions. This includes inks, blanket type and packing info, conductivity, roller stripes, pressure, and other information. This information is very important, because if the calibration drifts this information will help determine what has changed. Without being able to return to the referenced machine calibration state we will be unable to tell what has changed.

6. Preparation of the Press Form

The press form can be [downloaded here](#) or you can make your own form. Most important is that there should be at least 2 P2P25x targets on the form. You will notice that these are located on left and right, and top and bottom of the sheet. The form should be imaged as a linear plate. Before running we want to measure the plate with a plate reader and make sure we have a linear plate. Acceptable tolerances for a linear plate are generally +/- 2%. If for some reason you do not have linear plate, or choose to run with a non-linear plate make sure to record the values on the plate so that you can return the plate to this condition should your platesetter drift. Over linearization can cause printing issues. Keep in mind different line screens and screening types will require different curves.

7. Perform First Calibration Run

In the first calibration run we want to make sure that we can adjust ink solids to the right color for solids and overprints. We also provide linear sheet for measurement and creation of initial curves.

We will start up and have the press operator run the press up to normal densities. At this point lower densities are better than higher as it is easier for the press operator to add ink rather than to remove and take ink off.

Once the press operator is running pay close attention to the following:

- **Registration:** The press operator needs to achieve the best registration they can achieve. While no press is perfect, and paper has a great deal to do with this, fit can have a great impact on gray balance.
- **Evenness:** Make sure the press sheet is even. If the press does not have a scanner and you are reading with a handheld you can focus over the P2P targets. Even color is important and uneven inking can invalidate the calibration.
- **Charge:** Measure vertically up and down the sheet and have the operator adjust the charge if it is not even. In normal production operators cannot measure charge but the typical G7 test form contains bars that let you check and measure charge, which is important for a valid calibration.

Once we know we are printing correctly, we can begin to adjust for ink targeting. In G7 we do not have static target density number. We create the numbers for that press and ink combination by using LAB measurement.

To do this we make sure we have the target values for our reference print condition on hand. Below are the target values for GRACoL 2006. (Values for other G7 based datasets are available in CGATS 21 or ISO 15339.)

For GRACoL 2006 the required ΔE is 5 or less for solids, and ΔE 6 or less for overprints. Ink targeting requires increasing or lowering density until we achieve the lowest possible ΔE .

GRACol 2006	CIE L*	CIE a*	CIE b*
Paper	95	0	-2
C	55	-37	-50
M	48	74	-3
Y	89	-5	93
K	15	0	0
R	47	68	48
G	50	-68	25
B	24	17	-46

We read each ink solid and compare it to the desired solid, and then adjust. For example if yellow should be L* 89 A* -5 B*93 but the measurement is L*90 A*-4 B*89 you need to increase yellow density. Doing this requires a basic understanding of LAB. The goal here is to achieve the lowest delta E on press when compared to the reference print condition. For GRACoL 2006 the required ΔE is 5 or less for solids, and 6 or less for overprints. Ink targeting requires increasing or lowering density until we achieve the lowest possible delta E. Most current measurement devices have the ability to provide you with the deltaE calculation and LAB numbers. The Techkon SpectoDens can provide you with the delta E and LAB numbers, as well as a density recommendation and prediction of the lowest delta E, making ink targeting very easy to do.

Once we have achieved the lowest possible ΔE here we then want to target the overprints. Overprints are perhaps more important than the solids. Keep in mind that few people are buying printing made up of solid Cyan or Magenta. Poor ΔE on the overprints can indicate problematic proof to press match. In the same manner as above we need to adjust the overprints to have the lowest delta E possible. For example if my CM overprint reads L*24 A*17 B*-20 but should be L*24 A*17 B*-26, then I would need to increase Cyan. You may require slight adjustments to the solid densities to achieve the best overprints. If so make sure they stay below the ΔE limit for the reference print condition.

Keep in mind the color of the paper has a great effect on your ability to achieve these solids and overprints. A paper that is too blue will make some of these difficult to achieve, as will a paper that is too yellow.

Once you have the solids and overprints dialed in you are going to read the solids and these will become the target densities your operator will use. Have the press operator level the sheet and keep an eye out for registration, doubling, and print defects. Once the sheet is even, have the operator run a long set. Being stingy on paper doesn't help here, and running too few sheets will not represent the actual print condition. If you normally coat, then have the coater on with the most common coating. One benefit of coating is that it fixes the sheets and simulates dryback.

Once you have a level sheet, take at least 3 sheets for measurement. Look closely before leaving the press as bad sheets are often the culprits in failed press calibrations.

8. Measurement

The next step is to measure the sheets. Ideally the sheets would have set over time for dryback, but in many plants they do not have the luxury of waiting overnight before continuing the calibration. Part of the reason we drive the ΔE of the solids and overprints as low as possible is so make sure they will be valid after dryback. If you do notice a large color change after dryback you will need to wait for dryback before continuing with the calibration.

The sheets should be measured using UV included, and with the same measurement parameters as the reference print condition. Typically this will be done using a measurement application provided by the instrument manufacturer. The application should be set to XRGB as the output type. We are going to measure 3 press sheets, with 2 targets on each sheet. Name the measurements noting sheet number and position so you can make correlations if there are issues with the targets.

9. Curve Creation

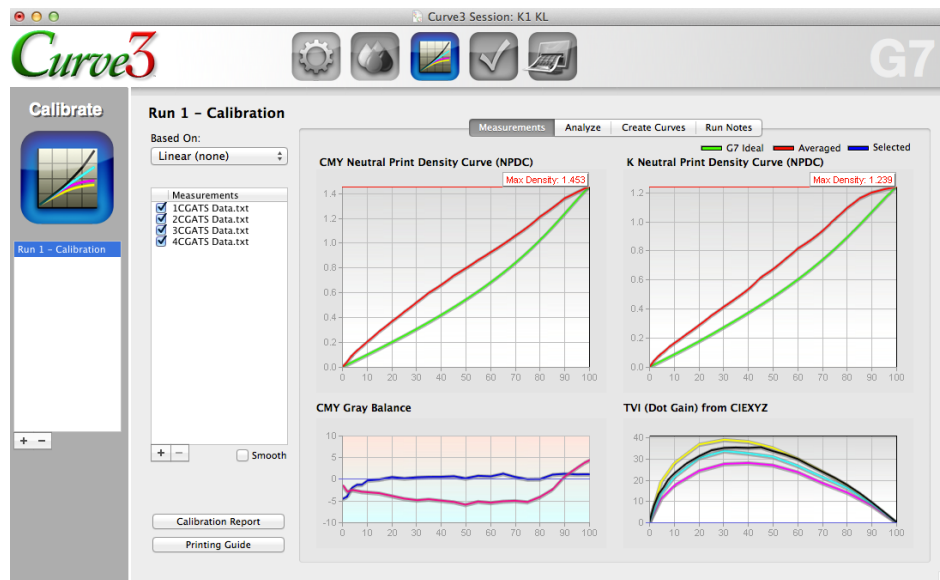
Once measured, we launch the software for making curves. In Curve 3 this involves launching the software, and importing the measurements.

Additionally, the following IDEAlliance Certified G7 Systems are certified to calibrate printing devices to meet the G7 grayscale definition using four 1-D Curves.

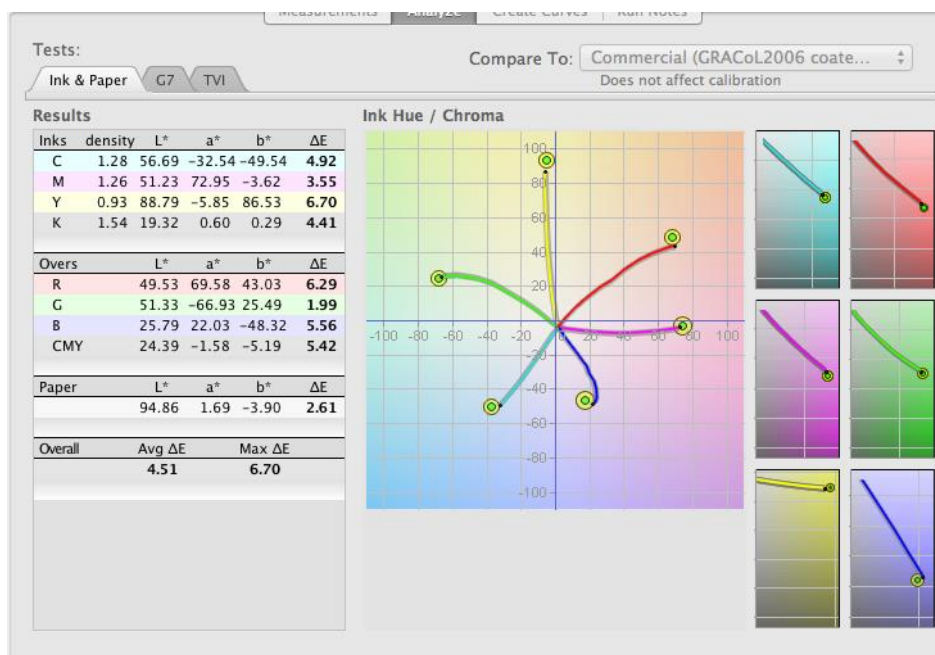
1. FUJIFILM ColorPath™ Sync®
2. Heidelberg Prinect® Color Toolbox
3. CHROMiX/HutchColor Curve2™
4. Alwan Dynamic Printer Calibration™
5. ColorGATE Productionserver / G7 Calibration Module
6. Konica Minolta Color Care™ version 2.2.1 with CurveCore™ Module
7. CHROMiX/HutchColor Curve3™

Once the measurements are imported, The Curve software will automatically calculate the NPDC aims, as well as gray balance aims, and will show these on the main screen. This first glance gives you an idea of how close you are on this first run. Click on each of the measurements and look for any measurements that have a high ΔE compared to the other measurements. In Curve 3 this shows in the lower right corner below the measurements. If you see that any of your measurements have a high ΔE compared to the others uncheck that measurement so it is not included in the calculations. The bad measurement could be due to a misread, bad patch, etc. Bad measurements are another thing to watch for as they can invalidate the calibration.

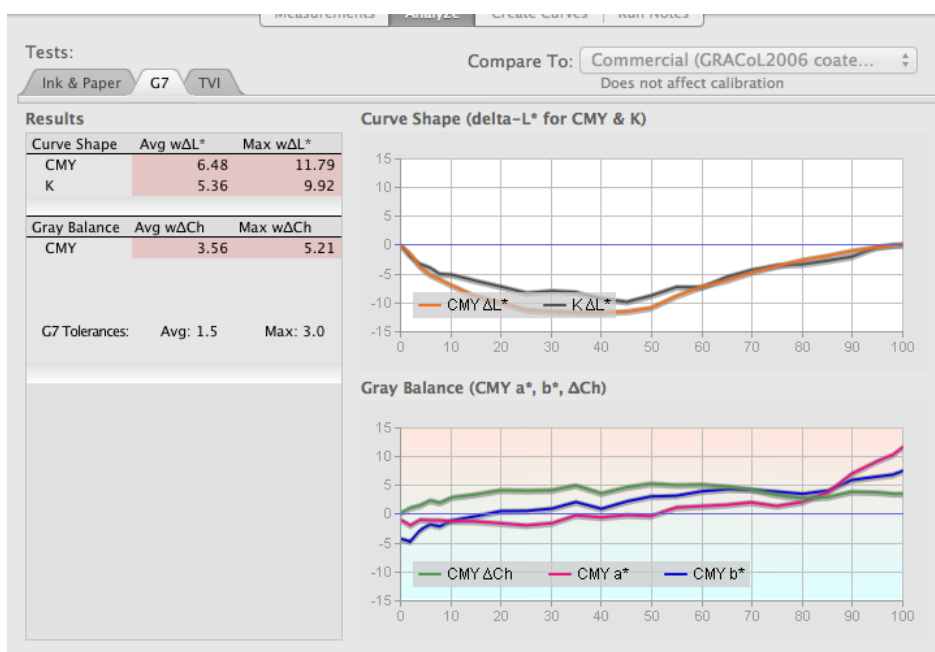
Next thing we want to do is go to the *Analyze* tab, and select ink and paper. Look at the deltas for the inks. These measurements should be similar to what you were measuring on press with the handheld spectrodensitometer. The tab to the right of ink and paper is G7. Select this and this will show you how close we are to G7 compliance. This screen shows ΔL (tonality) and ΔCh (gray balance). Unless these screens are green we will need another press run to achieve our calibration.



First Run: Green line is desired NPDC, Red line is actual press result. These sheets are too heavy. Gray balance in bottom left of window shows sheets are too green

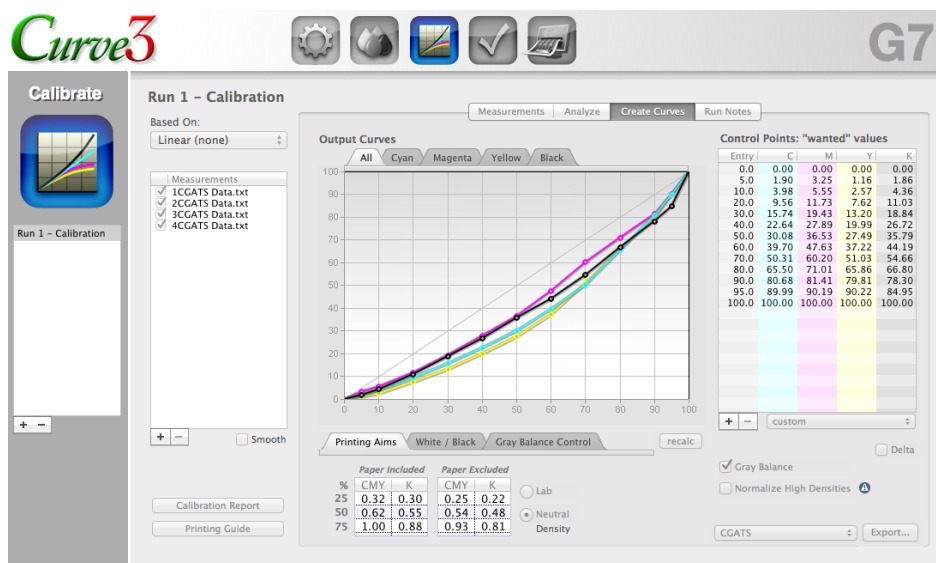


Ink and Paper: Check to make sure delta E of ink and paper correlate to what you were reading on press.



G7: The above screen shows failure to meet ΔL and ΔCh requirements. This is not unusual on the first run.

Next we click on the *Create Curves* tab. This tab shows us the required curves to achieve G7. Depending on the RIP you have you can save out the curve to a file and import it directly into the RIP, or hand enter it into the RIP. Once we have made these changes we output the corrected plates and go back on press. Before going back on press it is important to read the plates and make sure the requested changes have been made.



Create Curves: The screen above shows the curve values to be entered into the RIP for G7 Creation.

10. Second Calibration Run

When we go back on press we are going to run back up to the same exact densities. Once the sheet is level we will check ink solids and overprints to make sure they still meet the requirements of our reference print condition. If the sheet is level, registered, and the printed sheet has no defects we can begin to evaluate gray balance. For this we are going to do a quick check of the HR patch. We could also check for the NPDC now, or wait until we measure into Curve 3 to check the NPDC. In this case we will wait until we are back in the Curve 3 software.

Remember that gray balance definition of G7 is based on the color of the paper. Target aim for HR patch changes with the color of paper. Techkon SpectroDens dynamically calculated this calculation for you

Remember that gray balance definition of G7 is based on the color of the paper. This means the target aim for this patch changes dynamically with the color of the paper.

The Techkon SpectroDens can dynamically make this calculation for you, or you can easily perform this calculation in your head.

The gray balance aim we will be using will be based on the A* and B* values from the color of the paper. The equation for calculating the A* and B* aim of the 50% HR patch is

$$1 - 50/100 = 0.50$$

So if our paper has A*=1 and B*=-4 then target values for gray balance on HR patch would be A*=0.5 and B* -2. The HRpatch is the easiest to calculate as it involves just cutting the A* and B* values in half.

We are going to read the HR patch and see if it is close to the gray balance target. If it is right on, then we will pull 3 sheets and measure them. If it is still a little off – say it is A* 1 B* -1 then we will do a small density adjustment to move it slightly closer. If you can make a slight density adjustment of a few points and bring the gray balance closer without moving the solids and overprints out of tolerance this will give us the gray balance we need and

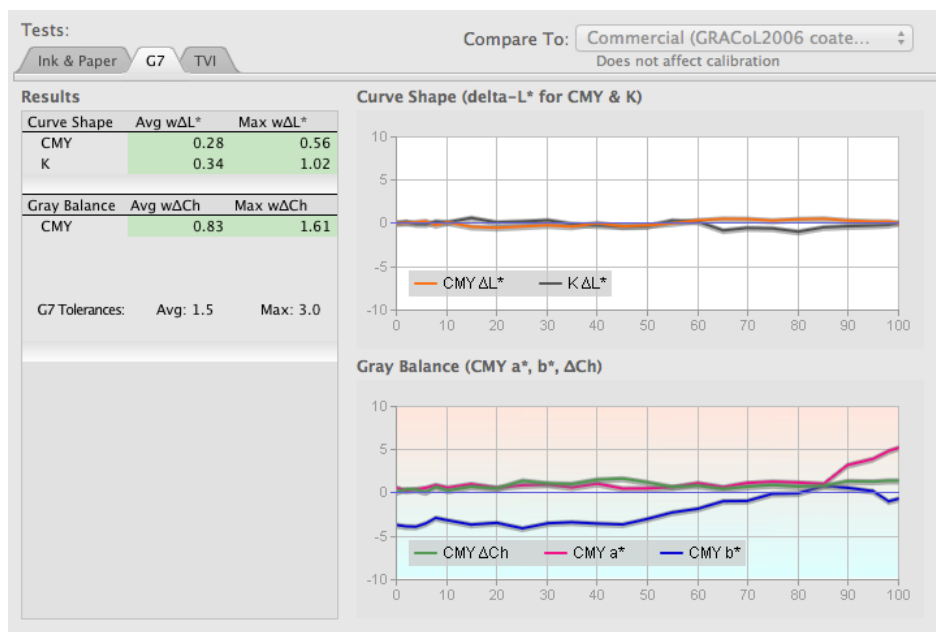
we can measure the sheet. If we cannot achieve the adjustment with a slight move, then we are going to have to pull off the sheets and make another curve adjustment by measuring these sheets and using Curve 3 iterate our current plate curve.

11. Evaluating Your Results

Once we have measured our sheets, we will import the measurements back into Curve 3. On the first screen we should see a much closer match between the target NPDC curves and our printed result. Next we will check the Analyze tab and select ink and paper and make sure our solids and overprints are still within tolerance. Finally we will click on the G7 tab. Here we can see that both our NPDC and gray balance are within tolerance. (If not, we have to regenerate correction curves and go back on press.) At this point we have achieved our G7 calibration. The next thing we need to do is to go look at the proof.



Notice the NPDC graphs are now close to the target NPDC Curve, and gray balance in the bottom left of the screen is close to the target aim.



With everything passing it is now time to look at the proof.

12. Proof to Press Match

There are several important things to keep in mind when evaluating the proof:

- You must have up to date bulbs and proper lighting for a proof to press match to be valid. In some cases when matching 2006 datasets with new lighting you may choose to place a UV filter between the lights and the viewing area. In either case without correct viewing conditions a proof to press match will not be valid.
- You must have a verified and valid proof. The proof must be to the target print condition, for example GRACoL. The proof must be verified by reading an IDEAlliance G7/ISO control strip with a UV included instrument.
- Expectations for proof to press match should be no greater than 85%-90%. That is to say that not everything on the sheet will match. The proof is a simulation and if 90% of the objects match, that is about as good as it will get.

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Normally in this process the proof to press match is acceptable. If not it often is lighting or paper. In some cases you may choose to make a slight adjustment to the press curves to improve the proof to press match. If you make this slight adjustment remeasure the sheet after the edit to make sure the sheet is still G7 compliant.

13. Recording Print Metrics

Once you have a final G7 press sheet, place several sheets in the drawer for reference and record the print metrics. These measurements will be used for troubleshooting in the future if there is a problem with proof to press match. Here are the metrics we want to record using the press operator's instrument. Keep in mind we already have an additional set of metrics recorded in the Curve 3 software.

- LAB values for solids: Used to tell if ink is the correct color, has changed, or has become contaminated
- LAB values for overprints: Used to tell if overprints have changed, chemistry issues, ink issues
- LAB values for HR, HC, SC: Used to check gray balance
- CMY density for HR: Used as an easy way for press operators to check gray balance during production.
- Density for solids: Used for press control
- Dot gain for all colors, 25%, 50%, 75%: Used to tell if there is an issue with a specific unit on press

14. Checking Production

During production operators should be periodically checking gray balance.

Gray balance can be checked via LAB targets, or by using CMY density all. If using CMY density all, it should be compared to the calibration CMY density all values. Adjusting the press values to the calibration values should improve the match.

Once we have recorded the above metrics we can use these in live production. If a press operator is having trouble matching a validated proof the press operator can check the following metrics:

1. Confirm they are at the target density
2. Confirm there are not any unit issues such as blanket, rollers, etc. by checking dot gain per unit and comparing to calibration data.
3. Check gray balance. Gray balance can be checked via LAB targets, or by using CMY density all.
4. Check LAB color of solids to make sure ink has not changed or contaminated.
5. Check LAB color of the overprints to make sure there is not an ink or chemistry issue

Normally reading the above metrics will quickly tell what has changed on a press sheet, and provide information for press troubleshooting and correction.

USING YOUR TECHKON SPECTRODENS WITH G7

The Techkon SpectroDens has many features specifically designed for G7. Many of these such as the G7 feature, which dynamically calculates G7 aims based on paper color, cannot be found in other instruments on the market. When performing a G7 calibration, checking production, or performing quality control measurements there are a number of features that are useful.

1. ISO Check – For Checking and Adjusting Solids and Overprints

One of the first steps in a typical G7 calibration involves targeting the ink to the LAB values of the reference print condition. G7 datasets such as GRACoL are based on ISO 12647 aims. ISO check provides a quick and powerful way to evaluate and correct ink issues. To use ISO check you need to go to ISO Check setup and make sure the proper paper type and background color is selected. (For GRACoL is this GRACoL c1 white). You then can take your SpectroDens and simply read the ISO ink solids. When you read a solid the screen will present you with a ΔE , showing how close you are to the target value. The screen also gives you a recommendation on how to improve the ΔE , telling you whether to move the density of the ink up or down, and predicting how low the ΔE can go. This feature is very handy because with one click you get all the information you need to move the ink as close to your reference value as possible. When selecting an overprint the SpectroDens gives you the Δ but does not give you the predictive information on how to improve the ΔE . It does give you the LAB values.



2. GrayGuide Feature

The GrayGuide G7 feature is one of the best features in the Dens. First go to the GrayGuide setup screen and scroll to the bottom. Here you can select the reference print condition. (For GRACoL is this GRACoL c1 white). Auto set a/b. This should be set to 0.5 for a and b. (This is performing the gray balance aim calculation according to G7/CGATS TR015). There is also a feature called SCCA, which performs relative substrate correction, according to CGATS 21/ISO 15339. Substrate correction adjusts the aim points for the reference print condition based on the paper color. If you are trying to match GRACoL 2006 you should leave this off, but if trying to get the best proof to press match based on the color of your paper you may want to consider leaving this on.



The GrayGuide performs a number of features. Most valuable is that in this one mode and on one screen you can see all the G7 values, along with traditional values such as density.

3. NPDC Functions

When selecting an NPDC patch such as the HR patch the Dens tells you how close you are to the target NPDC, and give you corrective information. By following the guide on how increase or decrease density you can improve your match to the NPDC target.

Check of Solids with Density and Overprints, with ΔE .

If you select a solid patch the SpectroDens will autodetect the patch, and will present you with the density and ΔE of the patch. If you read an overprint the SpectroDens will present you with the ΔE as well as the measured LAB values.



4. Check of Gray Balance

By selecting the CMY HR patch the SpectroDens will give you the A/B values, as well as the NPDC information. In addition to giving you this information it also gives you suggested correction information. For the NPDC this information is telling you whether you need to add or remove density to hit the correct NPDC. For gray balance the screen tells you how much C, M, and Y density to add or subtract in order to meet the gray balance target.



5. Scan Media Wedge

The scan media wedge mode allows you to read the IDEAlliance ISO 12647-7 Control Strip. You can either manually move the device, selecting each patch or set it up to auto scan. This can be helpful for verifying proofs, as well as other printed materials. The SpectroDens will read and then present you with a summary on the wedge print condition. The SpectroConnect software allows you to analyze the data in more detail, as well as to print a report.



6. How I Use It All

1. On the initial press run I use the ISO check feature to help tune the inks. I read C, M, Y, and K solids in several spots across the sheet and then have the operator adjust accordingly based on the SpectroDens recommendations. Once the ink solids are within the ΔE tolerance I then read the overprints, and comparing to the reference print condition adjust these until they are all passing.
2. On the confirmation G7 run, or during live production I use the SpectroDens in the following manner:
 - a. Read density and confirm that the inks are all at the proper densities, and the solids and overprints are all within the reference print condition ΔE .
 - b. Read the gray patch and confirm that the NPDC and gray balance are correct. If gray balance is not correct I use the recommendations from the SpectroDens to correct gray balance
 - c. Read the K NPDC and make any adjustments based on the SpectroDens recommendations.

LEARNING MORE

You can learn more about G7 at the following sites:

<http://www.techkonusa.com>

<http://www.freeprocesscontrol.com>

<http://www.idealliance.org>

<http://www.gracol.org>

CONTACT TECHKON USA

Call 978.777.1854

Email info@techkonusa.com

Visit www.techkonusa.com

CONTACT RON ELLIS

Call 603-498-4553

Email ron@ronellisconsulting.com

Visit www.freeprocesscontrol.com



TWICE AS GOOD:

- ✓ **2X** Speed
- ✓ **2X** Accuracy
- ✓ **2X** Functions
- ✓ **2X** Reliability
- ✓ **2X** Easier



2X Accuracy

Repeatability on Black	TECHKON	Competition
Average DE	0.04	0.19
Max De	0.11	0.53

2X Speed

Time, seconds...	TECHKON	Competition
Measurement	1s	2-3s
Wake up	Instant	4s
Power up	1s	14s
Calibration	3s	12s
5 patch consecutive	7s	14s

2X Functions

	TECHKON	Competition
Scan	Spot & scan in single device	Scan option with separate attachment
Aperture	2 apertures (3 and 1.5mm) in same device	Single aperture chosen at time of order
Software	Includes software for color quality control	Only has software for device management

2X Reliability

	TECHKON	Competition
Warranty	2-Year Warranty	1-Year Warranty
Recertification	Recertify every 2 years	Recertify every 1 year
Design	Solid state design with no moving parts, long life LED	Optics based on spinning filter wheel, short-life tungsten

2X Easier

	TECHKON	Competition
Configuration	One step M1-M3 mode change	Two steps M1-M3 mode change
Ergonomics	One hand use and software navigation	Two hands to operate device and software
Wireless	WiFi with greater range and universal use and network integration	Bluetooth with shorter range. No direct network integration

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