

Packed Summit Greets SWOP2006 and GRACoL2006

By David Zwang

The IDEAlliance event held March 5 in New York was billed as a “Proofing Summit,” and although the direction of proofing in general was discussed, the real focus was on the Print Properties Group’s recent work and the official introduction of the SWOP2006 and GRACoL2006 characterizations and programs.

Attendance at the International Digital Enterprise Alliance summit, held in conjunction with the Publishing Executive Conference and Expo, was better than expected and the room was packed with representatives from advertising agencies, publishers, printers, pre-media houses and a host of industry vendors.

Specifications for Web Offset Publications, or SWOP, were initiated in 1975 as a response to the printing industry’s need for uniform specifications and tolerances to ensure consistency and quality of material in publications. While it was developed as a specification and not a “standard,” subsequent need drove the creation of the TR001 characterization standard in 1995, which is based on SWOP. TR001 refers to an American National Standards Institute (ANSI) technical report titled “CGATS TR001-1995 Graphic Technology-Color Characterization Data for Type 1 Printing.” The Committee for Graphic Arts Technology, or CGATS, characterization was based on a small number of sheet-fed print runs trying to simulate a web production run.

Since this characterization was produced in 1995, a lot of things have changed. We’ve moved to CtP from film-based platemaking and we now have better control of press runs. Furthermore, the paper this characterization was based on is no longer manufactured. While this old SWOP characterization was the most widely used globally because of its inclusion in almost all design, graphic arts software and proofing and production packages, it was increasingly harder for presses to match due to all of the changes that have occurred.

Enter GRACoL (General Requirements and Applications for Commercial Offset Lithography). GRACoL is a task force founded by IDEAlliance in 1996 to develop a document containing general guidelines and recommendations that could be used as a reference source across the industry for quality color printing. Throughout 2004 and 2005, GRACoL conducted a series of 19 research press runs to develop a set of specifications and characterizations for commer-

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IDEAlliance (SWOP, GRACoL)	www.idealliance.org
European Color Initiative	www.eci.org

cial “sheetfed” printing on a No. 1 sheet. As part of this effort, characterization data from the ECI (European Color Initiative), FOGRA (The German Graphic Technology Research Association) and BVDM (The German Printing and Media Industries Federation) was used as part of the characterization development as well to ensure a global snapshot of print production.

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Unlike with previous standards-based characterization efforts, it was determined that since press runs are unique and variable, GRACoL was better off taking this amalgamated press run information and using algorithms to smooth the data to create a more widely achievable target.

During this process there was an outcry from global users and vendors who wanted a “global” set of print characterizations based on the ISO 12647-2 printing standard instead of a variety of collections of regional ones. This effort was initiated by the Ghent Workgroup (GWG), a global association of users and vendors in the graphic arts, and subsequently followed up by Printing Across Borders (PAB), a group of printers founded by Olaf Drummer with that same goal.

Since each of the regional characterizations were all claimed to be based on the ISO 12647 standards, a task force was created at an ISO TC130 WG3 meeting in April 2006 to try to foster this cooperative effort for a unified characterization data set. Unfortunately, to

date a global agreement hasn't been achieved and work is ongoing. However, the initial work led by GRACoL's chairman, Don Hutcheson, has resulted in the release of G7 and the GRACoL2006_Coated1 characterization data set.


Some clarification is needed, since confusion about the difference between G7 and the GRACoL characterization data was apparent at the Proofing Summit, as well as through other discussions. In fact, much of this confusion also seems to have had an impact on the timely agreement on global characterization sets.

When ISO12647, the specification for printing, was drafted (interestingly it was based on much of the initial work done by SWOP), it identified certain criteria to be used for defining the print conditions. That criteria included substrate, solid ink density (SID) and TVI (dot gain), but not gray balance. In retrospect, the primary reasons for this significant omission were the limitations of the tools, film and densitometric measurements at the time. The recently updated and published ISO12647-2 standard recognizes CtP and spectrophotometry as integral parts of the process. As a result, it also adds gray balance as a key criteria to this updated standard. This change to the standard can be attributed to the work done by GRACoL and the process that is now known as G7.

G7 was named for the seven ink colors (C, M, Y, K, R, G, B) used in the calibration process. While G7 has been attributed to be many things, it is really just a calibration method that uses spectrophotometric midtone gray balance and neutral print density curves (NPDC) instead of densitometric and dot gain aims. The G7 process doesn't just focus on numbers but also on appearance, which is another new development. As a result, work produced on many different types of devices (web, sheet-fed, digital, etc.) that have been calibrated with the G7 method all has a very similar appearance. And while their spectrophotometric gamuts might be of different sizes, they all have very similar shapes.

The documentation for this process, sample NPDC charts, working graph paper and the P2P gray balance target are available from GRACoL's Web site for those interested in performing G7 calibrations. For those interested in a more automated solution, Don Hutcheson and Steve Upton of Chromix have developed a software program, IDEALink Curve, marketed through IDEAlliance to help facilitate the process. For training on how to do it correctly, GRACoL, in conjunction with GATF, offers a G7 training and certification program. And finally, if you just want someone to come in and do it for you, GRACoL has a list of certified experts that you can contract with on their Web site. As of the meeting, there were more than 100 people trained from the U.S., Asia, Australia, Europe, Canada and Latin America.

The work done by GRACoL has been shared with SWOP and the Print Properties group chaired by Steve Smiley of Vertis, since they are all associated with



IDEAlliance Proofing System Certification

Job ID: H005

Application Approval: 9/11/06

Manufacturer: 3MG Americas

System: 3MG Color Proof

Output Device: 4PZ2100 Photo Series Using HPVivera Inks

Substrate: 3MG Proofing Media Semi-matte 250g

Certification Category: SWOP Grade 3

Certification Date: October, 2006

Expiration Date: October, 2008

Test Result:

Criteria	ΔLab	Pass/Fail	Tolerances
Visual Inspection		Pass	No Level 3 Defects
RTS 7/4 ΔE	0.97	Pass	Average ΔEab ≤1.1
RTS 7/4 ΔE (Cyan)	1.18	Pass	99% Success ΔEab ≤1.0
Color	0.94	Pass	
Cyan	0.78	Pass	
Magenta	0.97	Pass	
Yellow	0.93	Pass	ΔEab ≤1.0
Black	0.93	Pass	
Green	0.93	Pass	
Blue	0.94	Pass	
30/40/40 gray	1.08	Pass	ΔEab ≤1.5
Plate-white	Δa	1.30	Pass
Δb	0.90	Pass	ΔL ≤2.0
Δc	1.20	Pass	Δb ≤1.0
ΔE	1.20	Pass	Δc ≤2.0
40S 5. Uga/PODRA		Pass	Independent Tolerances
Exposure-Dens	1.30	Pass	Maximum ΔEab ≤1.5

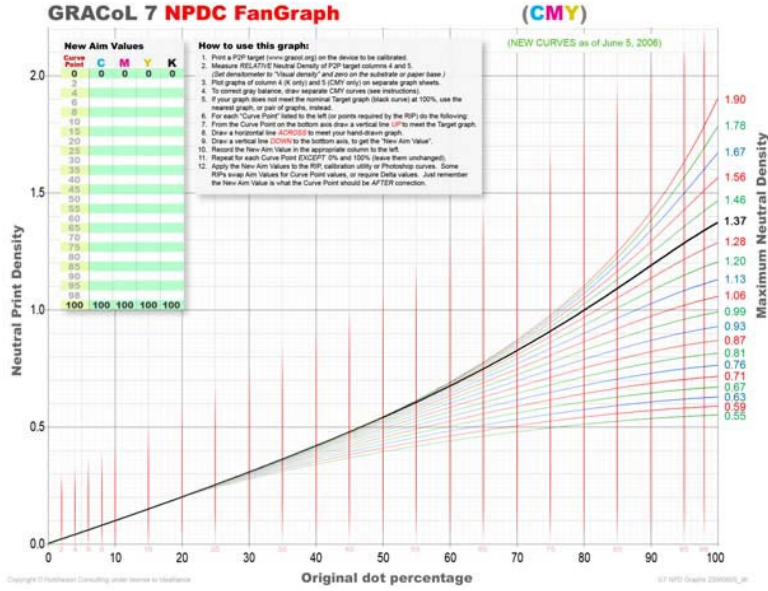
IDEAlliance hereby certifies the above proofing system for the GRACoL® SWOP® Certification Program

Certification Conducted By: RIT Printing Applications Laboratory

This SWOP/GRACoL form reflects the results of the certification process. Once a proofing system has passed all of the tests, it can use and promote the badge of certification.

IDEAlliance. All of the new SWOP and GRACoL characterizations were created based on devices that were calibrated using the G7 method. These results, along with numerous web print runs overseen by SWOP Chairman Nubar Nakashian, led to the development and release of two new characterization data sets: SWOP2006_Coated3 and SWOP2006_Coated5 that are based on No. 3 and No. 5 coated sheets, respectively. Now that there is a reliable method for calibrating and developing characterizations, both SWOP and GRACoL will continue to develop characterizations for additional paper types to represent the industry usage. As in the past, Time Inc. is at the forefront of standard adoption and has said it will require proofs using the new SWOP characterizations later this year.

Once you have printed the P2P target, you plot the results against this Neutral Print Density FanGraph to establish your tolerance against the target and find the optimal adjustment to your plate curve.



Both SWOP and GRACoL have applied to CGATS to take the three characterizations currently available and create technical reports to ultimately bring to ANSI for approval. That would in effect create ANSI standards such as TR001. The proposal to make SWOP2006_Coated3 - TR003, SWOP2006_Coated5 - TR005, and GRACoL2006_Coated1 - TR006 has been made and is currently under review by CGATS. Ultimately, the hope is that these technical reports could form the basis for negotiating global characterization standards in the ISO TC130 working group. In an effort to raise awareness and market this effort, a number of new programs have been introduced.

Certification

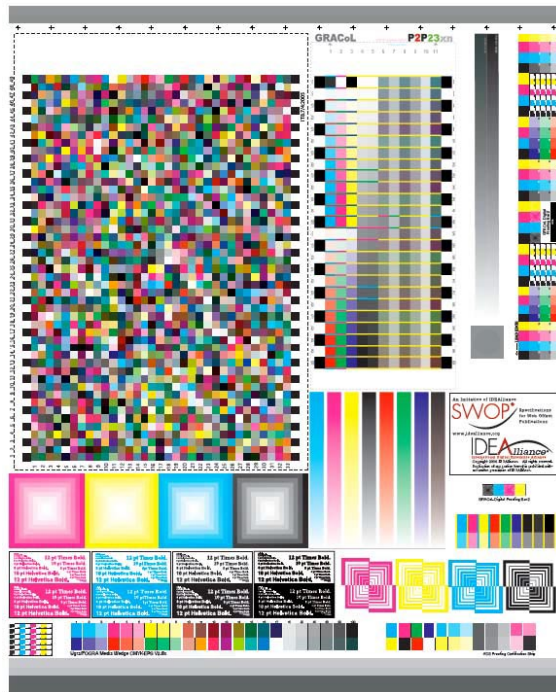
Certification will be conducted by Rochester Institute of Technology's (RIT) Printing Applications Laboratory. Under this program, proofs will comply with the international standards developed by ISO TC130 (Graphic

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Arts Working Group). There are two certification programs, one for hard copy proofing and one for monitor or soft proofing. Hard-copy and softproofing certification is no longer subjective; it has moved from a visual-based process to a metrological, color measurement-based process, although proofs are still inspected visually for defects and various imaging artifacts as part of the certification process.

Both certification programs will use the same newly designed test form consisting of two pages of targets and images. These targets include an IT8/7.4, the GRACoL P2P gray target, along with an assortment of other color and diagnostic patches. To certify a proofing system, you need to comply with certain very specific criteria. Due to differences and limitations in technology, the tolerances are slightly different in certifying hard-copy proofs vs. soft proofing.

In certifying for hard-copy proofs, a system includes a printer/proofer (hardware), a RIP or frontend system and a substrate. The certification is evaluated based on the following criteria: the difference between the characterization data set and the measured IT8.7/4 must have an average $\Delta E < 1.5$ for all patches and a maximum $\Delta E < 6.0$ for at least 95% of all patches. The solid patches C, M, Y, R, G and B must be a $\Delta E < 5.0$ from the characterization data set. The white point must be within a Delta $L^* +/- 2.0$, $\Delta a^* +/- 1.0$, and Δ



This certification test page contains the IT8/7.4, P2P, and other resolution and color targets to validate measurements against the target values.

$b^* +/- 2.0$ from the characterization data set. The difference between the 50/40/40 gray balance target and the characterization data set has a $\Delta E < 1.5$. The difference for each patch in the Ugra/FOGRA Media Wedge CMYK-EPS V2.0x and the ADS Proofing Certification Strip between pages must have a $\Delta E < 1.5$.

As of March 5, 31 systems have applied for certification — 14 for Grade 1 (GRACoL), 11 for Grade 3 (SWOP) and six for Grade 5 (SWOP) — and 23 systems are currently certified. The first systems were certified in October 2006.

In certifying soft proofing, a system includes a printer/proofer (hardware), monitor (hardware), a RIP



This certification page contains ISO standard image pictures and a variety of grey balance images to visually ensure a good reproduction.

or front-end system, and a targeted substrate grade. Measuring color and accurately quantifying it colorimetrically presents challenges. The D50 white point of the monitor is different than that of hard copy/reflection proof substrates in standard viewing booths. As a result, the measured white point of the individual displays will be used in lieu of published D50 white point.

Since there are no ISO standards for monitor-based proofing, this process will allow for the use of a weighted color difference calculation: CIE94 instead of the ΔE calculations used in the hard copy certifications. In addition, since the capabilities of the displays are not the same as hard-copy proofing systems, the tolerances will be a little bit wider. This is due primarily to the current state of display technology. While certain specific brands of monitors, such as those from Eizo, can achieve much tighter tolerances in the interest of gaining wider adoption, the decision was made to relax the tolerances for now. With the changes in display technology, the tolerances will probably tighten in the future.

The Soft Proofing certification is evaluated based on the following criteria:

Using the IT8.7/4, the patches will be displayed and measured one at a time. The difference between the characterization data set and the measured IT8.7/4 must have an average $\Delta E (94) < 2.0$ for all patches

and a maximum $\Delta E (94) < 6.0$ for at least 95% of all patches. The solid patches C, M, Y, R, G and B must be a $\Delta E (94) < 7.0$ from the characterization data set. The white point must be within a $\Delta L^* +/-2.0$, $\Delta a^* +/-1.0$, and $\Delta b^* +/-2.0$ from the characterization data set. The difference between the 50/40/40 gray balance target

The long-awaited SWOP 11th edition is finally being published as SWOP 2007 and will be distributed as a consolidated document that will include GRACoL, G7 and DISC specifications.

and the characterization data set has a $\Delta L^* +/-2.0$, $\Delta a^* +/-1.0$, and $\Delta b^* +/-2.0$.

RIT conducted a “dry run” in early February, when procedures, methods and tolerances were ironed out. Certification is due to begin by April. And the long-awaited SWOP 11th edition is finally being published as SWOP 2007 and will be distributed as a consolidated document that will include GRACoL, G7 and DISC specifications. It will be bundled with the June edition of Graphic Arts Monthly. A separate “Resource Guide” will be available online and on CD. **TSR**

David Zwang is a consultant specializing in process analysis, and strategic development of firms in the fields of electronic publishing, design, prepress, and printing. He can be reached at david@zwang.com.

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