

IPA Proofing RoundUP 2009

Procedures and protocol

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1. Introduction IPA Proofing RoundUP

The IPA Proofing RoundUP has been part of the IPA Technical Conference since 2001, excluding the 2008 conference. The procedure of the Proofing RoundUP has been refined over the years and went from visual tweaking by knowledgeable operators to proofing by the numbers as was demonstrated at the 2006 technical conference.

The 2006 results were ground breaking in that it demonstrated, for the first time, vendors were able to produce proofs within industry tolerances for visual match using just color management numerical techniques. In 2007 Proofing RoundUP vendors and users again submitted proofs of the digital test file prior to the conference. The vendors had no difficulties in achieving a very close match to the reference file by having an average ΔE of 1.01 from the target values, while the users had a surprising low average ΔE of only 2.21 from the target values. Since this appeared to confirm that the industry was fully capable of properly using proofing systems, the Proofing RoundUP was eliminated in 2008. But, anecdotal reports from users at the conference indicated that actual practice was still far from these potential results, and the RoundUP has been re-instituted for 2009.

Since the suppliers and users are still able to match the reference printing conditions it is necessary to focus on the actual state of proofing in terms of match to the reference printing conditions that is used in everyday business. As suppliers are able to routinely match characterization data, it is now of interest to explore other issues relating to color proofing, which could be causing the reported problems, such as any possible misinterpretations of the ADS's, any problems with measurement or other control mechanisms, the general willingness and ability of users to make every effort to try to achieve the same results as the experts, all resulting in a "spot check" of the real current status of proofs being supplied by proof providers in the commercial, publication and newspaper markets,

At the 2007 IPA Technical Conference a test was also done in regards to the ability of proofing systems to convey Pantone® spot colors. The proofs were compared to Pantone® color chips. While there was only a visual comparison, results seemed to support user reports that the proofing systems had the ability to match spot colors. There are however conflicting reports that, while initial spot color proofing meets user expectations, repurposing of those colors gives generally poor results. This will be investigated as part of the upcoming RoundUP.

Finally, through the advances of display technology it is now possible to have viable soft proofing solutions. The question is whether they can be held to the same tight tolerances as hard copy proofs. Obviously the controlling software can hold these tolerances, but the LCD display technology, which is the enabler of soft proofing

solutions, introduces its own set of challenges. In this iteration of the soft Proofing RoundUP the conference participants will be able to see which colors pose challenges to soft proofing and also that the type of LCD display being used can contribute to possible color challenges.

2. Procedure(s)

Here is a summary list of the proposed tests for the 2009 Proofing RoundUP;

Hard & Soft proofing:

- ADS Study
- Matching SWOP/GRACoL
- Grey Balance
- Step wedge
- Optical brighteners
- Multicolor proofing N-color profiles
- Marketplace survey of commercial proof providers
- Full gamut and optimized proofs
- End-User validation

3. Test descriptions

3.1 Hard & Soft (Monitor) Proofing Test Procedures

3.1.1 General Procedures

3.1.1.1 Test Forms For Both Hard And Soft Proofing

The sheet should contain the IT8.7/4 and also standard images. These images should include saturated cyan colors so that in the soft proofing systems we can explore the advantages of extended-gamut displays. Possible issues in regards to the proofing piece will be documented only. Other control elements on the form besides the IT8.7/4 target will be the P2P target, both the old and new IDEAlliance control strips. Also included, as an image, will be the Hutcheson 1000+ patch-proofing target. This will not be used to help develop the profiles; it will be used as a readout mechanism to determine how well the proof is rendering extrapolated color. Due to size, it will probably be an extra proof from some vendors and will only be required for the SWOP and GRACoL match. This test form, similar to that used in the 2007 RoundUP will be made available for download from the website associated with the proofing RoundUP. The test form will include test target for the iSis and the DTP70 measuring devices.

3.1.1.2 Hard Copy Proofing Systems Tests

For hard copy proofing systems, suppliers/vendors will be asked to submit their proofs four weeks before the conference so the data analysis can take place and proper measurement procedures be established that will also be used for the user validation part of this RoundUP. Vendors will be requested to pre-measure and tabulate their results from the IT8.7/4, the P2P and the new IDEAlliance control strip against reference data sets. From this, the final reports will indicate what percent of the delta E error (DE_{ab} and DE_{2000}) was attributed to the measurement and to compare the delta E error of the IDEAlliance Control Strip to the IT8.7/4 error. In cases where measurement is the major contributor to the delta E errors, a second submission may be required to determine the inherent error in the systems. Profiles should not include patches from the IDEAlliance target or the Hutcheson target that are not in the IT8.7/4 in order to determine whether the profiling process is accurately predicting other colors.

3.1.1.3 Viewing Conditions

The JUST Normlicht viewing booth will be the default booth for the process. The committee will attempt to have a GTI booth and a JUST variable booth for comparison values.

3.1.1.4 Monitor Proofing Systems Tests

Vendors should bring the combination of monitor/viewing booth that they prefer to do tests 3.1.2 through 3.1.7 that will be run live at the conference. The committee will spot check their measured results to verify the tests.

The default monitor, to be set up by IPA for an additional demonstration of problems associated with monitors and viewing booths (see 3.2.3), will be the Eizo 30 inch wide gamut, and it will be compared to the JUST light booth. The committee will attempt to also have an Apple 30" Cinema display in the JUST booth. If a GTI booth is available for comparison, an Eizo 30 inch wide gamut monitor will be set up in it. Vendors will be allowed to compensate for any non-uniformity that might be present in the display(s).

Vendors are welcome to do their tests in either of these setups, but they will have to be scheduled around the IPA demonstration.

3.1.1.5 Monitor Proofing Condition Demonstration

This section of the RoundUP is not meant to demonstrate which solution is better than the other one, but to show the challenges certain type of images pose to all of these systems. Specifically a comparison will be made between normal and wide gamut displays and especially how well they display images containing certain types of saturated cyan colors. The thesis for this section is that monitor proofing systems with wide gamut displays will have essentially the same ability to reproduce GRACoL reference characterization values to the same tolerances as hard copy proofing systems in the following tests, but lesser monitors will require approximately twice the tolerances to accommodate the colors that can't be reproduced and are clipped back to the monitor gamut. All soft proofing vendors will be scheduled into the IPA area during the conference. They will optimize their process for the Eizo display/JUST combination. The same output will also be shown on the Apple Cinema display in the JUST booth and the Eizo display in the GTI booth and compared to the best of the hard copy proofs from the vendors proofing test. The intensity of the displays will be set to 160 cd/m².

3.1.2 Application Data Sheet (ADS) clarity

This test is an on-site evaluation of the SWOP/GRACoL ADS. Can a knowledgeable user understand the ADS instructions? Is the reader confident that they know what is required assuming a basic knowledge of the respective proofing equipment. Is the ADS and the software "in sync"? Since, the format of the ADS is presently under review, it will also serve as an opportunity for users to review and comment on/help with the revised procedures. IPA team members and any willing users will review the ADS (vendors should use their revised procedure even if it is still being developed) during the first day of the conference. If there are any questions, the vendors will be asked to produce a proof under the supervision of the questioner,

using the ADS technique on-site for equipment in the vendor area and, if possible, at local sites for other equipment with supplier guidance. Vendors might also volunteer to generate a proof using the ADS-instructions. Outcome: The intention of this test is to exonerate the ADS's for any possible contribution to proofing variation in practice or to make suggestions for improved clarity of the documents. Results of this test will not list any vendor names. A general statement, i.e 45% of the present systems were not able to generate a proof using the ADS-sheets, will be given.

3.1.3. Matching SWOP/GRACoL

A well established test that checks for a match to a reference printing condition. Suppliers provide a proof containing an IT8.7/4 target that should match GRACoL #1 or SWOP #3, etc. Justification: This is a “sanity-check” to ensure that commercial products are working as intended and that commercial products can still produce proofs that form the basis of certification. Soft proofing systems will be measured for numeric match and, if also set up for visual match, will also be measured to determine the effect on the numeric match.

3.1.4. Grey Balance

The test form described in 3.1.1.1 contains also the P2P target. From this target we measure and determine compliance with G7. We ask the question if the proof meets GRACoL and the GRACoL characterization data set was developed with the G7 neutral density curve calculated into the process, does it also meet G7? It has been assumed that it should, but it is a very useful and relevant question to ask are there any potential problems with this thesis. It also highlights the difference conceptually between GRACoL and G7. The G7 process can be analyzed using the IDEALink Curve software analysis tool. The whole test will begin to determine tolerances for the G7 process, at the moment there is nothing that says “this proof meets G7”. The issue of gray balance is the underlying parameter, so this will be indicated by also using ISO 12647-7 tolerances for ΔH , hue difference between CMY and K. The P2P target is part of the test form described in 3.1.1.2, but only the proofs generated to match GRACoL #1 printing conditions will be evaluated. Since this test is part of the test in 3.1.1.2 the same time line for vendor/supplier submissions applies here as well.

3.1.5. Step-wedge

The use of the new IDEAlliance ISO 12647-7 2007 and 2009 Color Control Strip will be evaluated. Does measurement of this strip ensure GRACoL compliance? Should the IDEAlliance target have larger tolerances in practice than the IT8 because it has to be extrapolated? Are RIPs able to interpret the decimal values in this file? If you pass the control strip test, do you also pass the full 1617 patch test? How useful is the control strip in verifying a compliant proof? Does the 2009 version of the control strip give more accurate readings than the 2007? The IDEAlliance ISO 12647-7 2007 and 2009 Colour Control Strips are part of the test form described in 3.1.1.1.

3.1.6 Optical Brighteners

This test is actually a concerted effort by the vendors to address and give guidance to their customers on how to address a very pressing need in the industry. It evaluates any proofing system's ability to match a press sheet with optical brightening agents (OBA). All commercial press sheets contain OBAs, which make the paper look white and measure blue. In color management the best advice to date has been to create a false situation by removing UV light and the effect of OBAs. This is not realistic. Suppliers are asked to match a presssheet that contains OBA's. A standard press sheet will be printed at Ryerson University on a coated paper with high OBA. Proofing suppliers will be asked to use any technology/solutions at their disposal to create a match to this press sheet (there has to be some formulation in the process like "average the profiles developed with and without UV in the measuring source" so that users could reproduce the technique. It cannot be an unexplained visual match and document the tools/techniques used to achieve a good result. The proof will be compared to the sheet under standard D50 lighting conditions in both booths (JUST and GTI). The vendors partaking in this test need to document:

- the OBA content in the inkjet media
- the tools used to correct measurements
- any filter settings used in the measurements.
- The light booth used for achieving the visual match
- The formula for the match.

The brightness of the papers (press and proof) will be evaluated using the TAPPI 452 method that measures the brightness at 457 nm and CIE Lab measurements with and without UV included.

Outcomes: a very interesting practical test that helps explain to the community the challenges of OBAs in proofing and printing paper. This test is applicable to both hardcopy and softcopy systems.

For this test the test form described in 3.1.1.1. will be printed on the Printmaster PM74 press at the School of Graphic Communications Management. Vendors/suppliers who wish to participate have to state their intent by April 15, 2009. The press sheets will be sent to them via FedEx or UPS. This is an optional test. Since this is an esthetic trial, there are no time requirements for submitting the proofs. The last day of proof submission is the starting day of the conference. Vendors can submit also multiple attempts if a better visual match is achievable. Any new submission must be accompanied by a document containing the required elements listed above.

Conference attendees will have the opportunity to evaluate the visual match using viewing conditions specified by the vendor who generated the proof.

3.1.7 Multicolor Proofing N-Color Profiles

Use of multicolor (CMYK + 2 or 3 special colors, or extended ink gamut set), for packaging applications. The special colors in inkjet printers makes this a relevant investigation since inkjet proofing systems can use up to eight colors. It is possible to examine those systems that may be using spectral mixing methods or some other form of mathematical mixing between the 100% solid and the tone scales. Some systems are based on spectral data, while others have a system that is based on mathematical modeling. It is useful to test/evaluate multicolor printing system for hardcopy and softcopy systems.

The committee will determine whether we can use a real job that has been printed using the actual profiles for the job. N-color proofs will be made using those profiles.

3.2 “Normal” Marketplace Results

3.2.1 Characterization Data Set Survey

For the hard proofing tests, proofs will be solicited by print buyers from their print service providers. Proofs will be made to match any of the following printing conditions: GRACoL, SWOP3, SWOP5 and SNAP. Three groups of print buyers will be approached: 1. Agency and brand managers from the publishing industry will be asked to supply SWOP proofs; 2. Designers identified through organizations like Print Buyers Online will be asked to supply GRACoL proofs; 3. Agency and brand managers from the newspaper markets will be identified through NAA to supply SNAP proofs. The print buyers from all three groups will be asked to request proofs made using the above targets from their current print service providers. They will request the proof be made per the appropriate SNAP, GRACoL or SWOP specifications.

The measurement data gathered from the IT8.7/4 target on these proofs will be compared against the chosen reference characterization data for those patches. Since this is obviously not a test of the individual systems, the results will only be published as aggregate results by market place and in total. Variation by type of systems will be published if there is a definite trend, but the user identification will not be published (except in cases where the user qualifies for a certificate)

The benefit to the print buyer will be an assessment of the accuracy of their proof supplier by comparison to industry average as well as to the ideal conditions identified in 2007. To make it worthwhile to the proof suppliers, they will be offered a discount on the Technical Conference registration fees after they have submitted their proofs. Also, if their proofs have met industry tolerances, they will receive a

document to the effect that they have demonstrated compliance with SNAP/GRACoL/SWOP compared against ISO 12647-7 tolerances (less restrictive than SWOP) in a blind test under production conditions.

3.2.2 Spot Color Survey

The marketplace survey will also include real world proofs that contain identified Pantone® colors (within gamut) and will be solicited from printers and publishers across the industry. The proof will not be shown publicly, only the proofed Pantone® color patches, the numeric matching results, the marketplaces and a generic product description will be released. For the submission of the proof two questions need to be answered:

- Was a Pantone® color chip provided with the proof?
- Was the proof and the resultant print deemed acceptable by the proof buyer?

To facilitate the visual and measurement aspects of the test, Pantone® will be asked to supply five good swatch books for this test. Measurements of the Pantone colors from these five books will be averaged and used as the color standard for the Pantone® color(s) present on the proof (statistical variation will be noted). The paper white of the proofing paper will also be measured and compared against the paper white of the Pantone® books to determine the base induced ΔE and whether this has much bearing on any variation.

3.2.3 Full gamut and optimized proofs

Vendors and also conference attendees will have the opportunity to submit proofs, constrained for a reference characterization data of two IT8.7/4 targets with one target set without any color management to show the full gamut of the proofing device. Each target will then be used to measure how many Pantone® colors can be reproduced within the effective gamut either the characterization data set or the full gamut of the proofing process using the Graeme Gill's Argyll color management system (Gill) and the ColorPatch Tool from Babelcolor. Participants will get a certificate that will state the amount (percent) of Pantone colors their proofing system can show.

3.2.4 User validation

Also, leading up to the conference, users will have the opportunity to submit their own proofs. For this purpose the test file described in 3.1.1.1. which includes the IT8.7/4 test target will be made available for download from the conference website. The deadline for the submission of user-generated proofs is also four weeks before the conference starts. Users who submitted a proof and would like to attend the conference will receive a discount for the registration fee.

TEST Checklist:

For vendors:

1. ADS evaluation
2. Matching SWOP/GRACoL
3. Grey balance test
4. Test of the IDEAlliance step-wedge 2007 and 2009 version
5. Multicolor Proofing N-Color Profiles
6. Full gamut and optimized proofs

Optional test:

1. Compensation for optical brighteners

Marketplace evaluation:

1. Characterization Data Set Survey
2. Spot color survey
3. Full gamut and optimized proofs

IPA JDF RoundUP 2009

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Concept

The concept for the JDF RoundUP test is very simple. A JDF file will be created in a software “manager” application and that file will be offered to “workers” to consume and interpret the file. Any instructions or content that are contained within the JDF file should be executed. If there are instructions for a proof, for example, the test seeks to determine if the software accepting the JDF file correctly interprets the instructions in terms of crop marks, tag lines, and pages imposed from source PDF documents. This test is relevant as many suppliers provide solutions that are “JDF compliant” and there is great interest in the end-user community to automate parts of their workflow.

Certified Products

CIP4 via PIA/GATF certifies that products produce JDF files that meet appropriate specifications. A “JDF certified” product such as Dynagram Dynastrip or Kodak Preps are certified under the LayCrimp ICS. LayCrimp stands for layout, creation and imposition and ICS stands for Interoperability Conformance Specifications. User validation of a JDF file can be done via the JDF Editor, a program available from CIP4.

LayCrimp ICS

The JDF RoundUP will include an examination of the LayCrimp ICS. In this test, a JDF instance will provide a run list that includes signature layout parameters as well as parameters for the placement of printer's marks and will use URLs to indicate the PDF files and other data files containing content and marks. The target sheet will not be printed duplex and all content will be rendered to one surface of the sheet. The IPA team will create a flat imposition pdf using a certified product and will share the JDF file of the job. The test is to see if a software supplier can accept the JDF file, and using only instructions within the JDF file, accurately re-create the imposition.

MIS to Prepress ICS

In this test a certified MIS to Prepress manager product will be used, for example Hiflex MIS. The MIS system will create a JDF job ticket containing as much information as possible. Some categories of data may be available, others may not, for example, imposition preparation, plate making, and prepress preparation may not be available. Job details like size and quantity may be encoded. If the consuming product does not use particular instructions, it must transmit those unaltered. The JDF job ticket from the MIS system will be offered to participating suppliers to consume. Those products with certification can consume this file, even products who have not sought certification can consume this MIS to Prepress file.

Practicalities

Demo files will be posted for suppliers to try. At a given date and time the final JDF files will be made available. It will be necessary for vendors to provide a hardcopy/softcopy proof of this system and have IPA managers verify that all imposition or other job criterion are present. It is not necessary for the products to be on-site. PDF proofs could be made off-site and sent in, or the job may be displayed on the screen.

Outcomes

The printing industry can be considered to be both “a la carte” and “fixed menu”. The content of each job is different, thus printing is “a la carte”, however the production of jobs is often standardized, e.g. 8-up signatures on a press sheet. Automation is necessary as the printing industry is not a high profit margin industry. JDF provides an opportunity for efficiencies from process automation, and more accurate and more detailed feedback for costing and identification of bottlenecks or un-billed expenditures. At the moment, JDF is not plug-n-play, supplier to supplier integrations are necessary. This series of tests seeks to move the JDF protocol from the world of “integrations” towards the utopian world of “plug-n-play”. Much progress has been made in JDF integrated solutions – the test will demonstrate and applaud those successful implementations. The tests will at the same identify areas in which JDF integration is not working. Examples of “bad practice” such as unnecessary xml namespaces or improper file spec notation will be highlighted.

Bibliography

Gill, G. (n.d.). Retrieved 01 06, 2009, from Argyll Color Management System Home Page: <http://www.argyllcms.com>

ISO 12647-1:2004¹⁾, Graphic technology — Process control for the manufacture of half-tone colour separations, proof and production prints — Part 1: Parameters and measurement methods

ISO 12642-2: 2005, Graphic technology — Input data for characterization of 4-color process printing (ANSI/IT8.7/4-2005 is equivalent)

ISO 3664:2008, Viewing conditions for graphic arts and photography

13655:2008, Graphic technology — Spectral measurement and colorimetric computation for graphic arts images