IDEAlliance PROOFING CERTIFICATION & VERIFICATION PROGRAMS

(Version 16)

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I. Philosophy – Program Attributes

A Intention

This specification is intended to define the proofing certification associated with GRACoL® and SWOP®. It is intended to comply with all aspects of ISO 12647-7. Any disparity is unintended and questions should be clarified with the Print Properties Working Group of IDEAlliance.

B Program Components

The IDEAlliance Proofing Certification Program will be made up of two (2) components that will be phased in over time. These components include:

1. **IDEAlliance Proofing System Certification**
   IDEAlliance confirmation that a given vendor's fully specified proofing system has the ability to match specific CGATS or other documented characterization data sets within exacting tolerances.
   (Phase 1 Hard Copy Certification, Fall 2006)
   (Phase 2 Monitor Certification, Spring 2008)

C Certification Types

There will be at least 3 paper types that can be certified against within this program. For the purposes of this Certification Program we will identify certification types as:

- SWOP Publication (Grade 5), such as Monterey Gloss
- SWOP High End Publication (Grade 3) such as Fortune Gloss
- GRACoL Commercial (Grade 1 coated) such as Luster Gloss
- Others will be added as appropriate

D Basis for Proofing System Certification

The proofing system certification will be based on:

1 Defined visual/analytical content to fill a "normal" web or sheetfed press sheets. This content will be divided into three parts:
   a. Required analytical targets for certification and verification of all aspects of proper color, artifact detection, and prescribed placement of this information in the smallest usable size to optimize comparison and control.
   b. A select number of standard images that the industry has determined can be used to realistically challenge reproduction.
   c. A larger bank of images that can be revised to reflect evolving market needs and applications.
   d. See Annex A for content and layout of the form

2 Print Properties Working Group recognized referenced printing characterization data sets (the specific CIE Lab numbers for the IT8.7/4 certification targets for each set) derived from GRACoL and SWOP based printing specifications to reflect specific market uses. Each characterization will specify Lab values for given CMYK input values including the specific paper white point. These characterizations will all be produced using the G7 process and the whole family will have similar relative colorimetric data from highlight to midtone to facilitate multiple characterization data set use.)

3 Other specifications: While it is assumed that color management will be sufficient for producing the proper color in proofs, the following information will also be included as part of any reference printing condition to be evaluated and must not be the cause of any visual variations between submitted proofs and the numeric and/or visual references:
   a. Resolution specifications for proofs. A proofing system must be able to hold detail commensurate with the indicated resolution of the finest market it will serve. No observable loss of detail
   b. Screening/ripping specification (dot shape/UCR/GCR) but only as needed for reproduction purposes. Proofing can no longer be expected to show these attributes since many proofs do not have dots and, for those that do, color management will affect the dot shapes and relative values for a given color.
4 The requirement that there be a visual examination of proofs prior to conducting numeric evaluation. Visual examinations will follow the checklists provided in Annex C. These examinations will assure that there are no visually unacceptable artifacts in the proof. These would include but not be limited to physical abrasions, image based artifacts plus color based artifacts.
5 Color measurement data generated per ISO 13655 for hard copy proofs.
6 Viewing conditions based on ISO 3664 with UV content included.
7 An Application Data Sheet using the template in Annex G for each proofing system and each market application. This data sheet must specify:
   - Proper equipment, equipment calibration, proof production and finishing procedures for the system
   - Proper profile to achieve the required characterization data
   - Proper substrate to achieve the proofing result
   - An exact iteration of the information defined in this procedure for an IT8.7/4 target including: goal CIELAB values and tolerances for the specific characterization data set plus the appropriate measurement and viewing conditions. It must also include the maximum delta E(ab) that can be expected for any given patch in the IT8.7/4 data set.

II Details of Hard Copy Proofing System Certification Process

The certification process for hard copy proofing systems will be a metrological evaluation. Certifications will be ongoing. From the time of acknowledged receipt of all required materials, certification results will be delivered in a maximum of 30 days, with a goal of a two week (14 day) turnaround. The details of the process are documented below.

A Submission of Application

To begin the process any hard copy proofing system manufacturer may submit an application for certification of a given system to the Evaluation Contractor with a submission that includes the following:

1. An application form (see Annex B) for the system must be completed and submitted along with the entire certification fee for the system.

NOTE: The application and the application fee must be submitted for each system and paper type /characterization data set combination for which the manufacturer wishes to be certified. Systems must be named using the standard naming convention that will include substrate specification.

2. A separate Application Data Sheet based on the standard ADS template for each target characterization data set to be certified for this system must be submitted. See Annex H for ADS template
3. Three (3) sets of proofs must be submitted. This will provide adequate backup should flaws in any set of proofs prohibit taking the required measurements.
4. The proof sets can either be a 2 page proofing form (17x21) or a 3 page proofing form (12x17) depending on the output device. The forms will include content from the illustrative pages shown Annex A for each market segment to be served (Images may be updated by the IDEAlliance Print Properties Working Group and be made available on the IDEAlliance website.) See Annex A for form content. Initially one (1) of the three sets will be measured. Should that fail, targets will be measured once more. Should that still fail, targets from a second set of proofs will be measured. One set of proofs will be retained by the Evaluation Contractor for one year following the certification. The other sets of proofs will be destroyed and will not be returned to the manufacturer.
5. When all required materials have been received, the manufacturer will receive an email from IDEAlliance indicating that the certification is ready to begin. The email will include the number of other systems that are in the certification queue ahead of this manufacturer's system and an estimate of the time it will take to complete the certification evaluation.

NOTE: Because certification will be numerically based, any proofing system manufacturer seeking certification may submit a proof to the Evaluation Contractor for measurement with the designated certification measurement device so the manufacturer can determine the instrumentation differential in order accurately verify proof tolerances before submission for certification. A nominal fee will be charged for this service.

B. ADS Review and Approval

1. Each ADS submitted with the Certification Application will be reviewed by the Evaluation Contractor upon submission.

2. The proofing system manufacturer will be required to answer any questions and make any corrections required by the Evaluation Contractor prior to the Metrological Evaluation.
3. The manufacturer will be notified when the ADS has been reviewed and approved for the certification process.

C Visual Inspection of Hard Copy Proofs

1. All submitted proofs will be visually inspected by the Evaluation Contractor prior to metrological evaluation.
2. Inspection will be based on the checklist found in Appendix C. The Evaluation Contractor will notify the manufacturer with the results of the visual evaluation and the Print Properties Committee if any level 2 or 3 defects are found. Results are informational only and will not be part of the pass/fail criteria for the proofing system, but the Print Properties Committee may require further visual testing before Certification is given.
3. If level 3 defects are found, the proofing system manufacturer will be required to resubmit a new proof.

D Metrological Evaluation

The proof will be evaluated metrologically using a known traceable (see Annex D) spectrophotometer (per ISO 15790) and compared to its respective goal characterization data set. The DTP70 has been selected for this certification.

NOTE: The selection process involved testing and comparison to the Eye-One IO and the Spectrolina Spectrascan for accuracy, repeatability and speed. Data from the evaluation that lead to device selection will be made available upon request. Also note that all of the candidate measurement devices were within tolerances and are reasonable choices for the measurement of individual proofs outside the certification process.

1. All submitted proofs must pass the general measurement requirements in ISO 12647-7 and will meet tolerances specified in Annex E, F and G with UV included
2. Proofs will be measured against white backing as per CGATS.5-2004 with the following characteristics: (1) shall be known to be opaque, (2) diffuse-reflecting, (3) CIELAB L* greater than 92, (4) CIELAB C* less than or equal 3.0 and (5) non-fluorescing.
3. The delta E a*b* formula will be employed. This decision based on results of the proofing roundup (June 2006) where 21 proofs that looked visually similar were delta E a*b*$\leq$1.5.

NOTE: The Evaluation Contractor for IDEAlliance will collect data from systems certified in 2006 in order to compare and further evaluate delta E formulas for certification and/or to tighten tolerances further.

4. The IT8/7.4 target will be measured to evaluate the match to the target characterization data set. In addition the IDEAlliance Fogra+ color bar will be measured on each page to determine consistency among the pages. Measurements of the Ugra/FOGRA Media Wedge CMYK-EPS V2.0x and the ADS Proofing Certification Strip will provide the gray balance measurements.
5. Five (5) numeric criteria must be met in order for a system to be deemed to have passed certification and to be labeled as “Certified.”

- If the difference between the characterization data set and the IT8/7.4 target is an average delta E ≤1.5 for all patches and a maximum delta E ≤6.0 for at least 95% of all patches.
- If the solid patches cyan, magenta, yellow, red green and blue on the IT/7.4 are delta E ≤5.0 from the characterization data set.
- If the difference between the characterization data set and patches on the IT8/7.4 target has white point of a delta L +-2.0, a delta a +-1.0 and a delta b +-2.0 (excluding florescence).
- If the difference between the 50/40/40 gray balance target and the characterization data set has a delta E ≤1.5
- If the difference for each patch in the IDEAlliance ISO 12647-7 2007 Control Strip between Page 1 of 2 and Page 2 of 2 (or Page 1 of 3, Page 2 of 3, and Page 3 of 3 if using the 12x17 pages) of the form is delta E ≤1.5.

6. If the numeric criteria are not met, the proof will be re-read and, if it again fails, a second set of proofs will be read. If this fails, the proofing system manufacturer will be notified that they have not passed certification. The certification fee allows for a second trial for each system.

E Reporting Results

Results will be reported within 3 working days of the conclusion of the Metrological Evaluation. Results may require the manufacturer to update of the ADS to bring the ADS into conformance with the official metrological evaluation.

F Posting Results

1. Vendors who have successfully passed certification will be notified by the Evaluation Contractor by email. If an update to the ADS is required, the Contractor will note that as well.
2. Vendors will be provided with the certification logo with their certification date and rules for use on their websites and marketing materials.
3. The Contractor will provide a final ADS to IDEAlliance in MS Word format using the provided template for evaluation, insertion of the logo and conversion to PDF.
4. Certified Systems will be .posted in the IDEAlliance SWOP/GRACoL Certified Proofing Systems online database..

NOTE: The Print Properties Working Group defines the tolerances for the proofing system certification program. The Print Property Working Group reserves the right to adjust these tolerances on an annual basis to reflect industry trends.

III. Details of the Monitor Proofing Certification Process

The SWOP certification process for monitor proofing systems will be a metrological evaluation as of January 2007. In the past, monitor proofing certification by SWOP was conducted at a central certification location so those evaluating systems would conduct "blind" testing. Now that the subjective visual evaluation component of monitor proofing certification has been removed the requirement for blind comparison has been eliminated. Note that in this definition of certification for monitor proofing, the term "characterization data set" refers to the same set of data used in conjunction with hard copy proofing for a particular standard print condition.

Systems and ADS's submitted for monitor certification SHOULD incorporate displays and procedures that comply with the specifications in ISO12646 difining specification for luminant cd/m2. Deviations from these specifications should be explained by the vendor.

NOTE: IDEAlliance has selected a single, external measurement device, the X-Rite Eye1 Pro spectrophotometer to be used in all monitor certifications. Because each monitor proofing system has its own measurement system embedded, Manufacturers will be required to write a software application to support external Eye1 Pro measurements in order to be certified.

A Submission of Application

Monitor proofing system Manufacturers may submit an application for certification of a given system that includes the following:

1. To begin the process, any Manufacturer can submit a completed application form (see Annex B) found at www.swop.org/certification/certapp.asp along with the entire certification fee for the system and a verification that the Manufacturer can provide a means of automatic measurement of their proofing system using the Eye-One Pro measurement device. A location and evaluation date must then be scheduled between the Manufacturer and IDEAlliance.

NOTE: The application and associated fee must be submitted for each system and paper type /characterization data set combination for which the Manufacturer proposes to be certified. Systems must be named using the standard naming convention that will include substrate specification. Note that three (3) paper types are anticipated and certification of a given monitor proofing system with each paper type comprises a separate SWOP certification with separate certification fee.

2. An Application Data Sheet based on the standard (new) ADS template for each target characterization data set to be certified for this system must be submitted. See Annex I for ADS template
3. When all required materials have been received, the Manufacturer will receive a notification from IDEAlliance indicating that the certification may be scheduled. The email will include the number of other systems that are in the certification queue ahead of this Manufacturer's system and a scheduling window.
4. The Manufacturer must schedule the evaluation date with IDEAlliance. Booking the certification evaluation is at the discretion of IDEAlliance and availability of its designated Evaluation Contractor.

NOTE: that for monitor certificatitons, the manufacturer may schedule the certification to occur at the RIT labs. Alternatively, they may choose to schedule the certification to occur at a site of the Manufacturer's choices. In this case a separate surcharge to cover travel, expenses and the additional RIT staff time will be negotiated directly between the Manufacturer and RIT staff.

B Visual Evaluation

NOTE: It has been the objective of this revised procedure to minimize dependence on visual assessment and rely primarily on metrology to determine pass/fail. Both hard copy and soft proofing certifications will check for level 2 or 3 defects as described in Annex C, but critical color will be primarily defined by metrology.

1. All test form images will be displayed on the monitor proofing system and inspected by the Evaluation Contractor prior to metric evaluation.
2. Inspection will be based on the checklist found in Annex C.
3. The Evaluation Contractor will notify the Print Properties Committee if any level 2 or 3 defects are found. Results are informational only and will not be part of the pass/fail criteria for the proofing system, but the Print Properties Committee may require further visual testing before Certification is final.

A visual inspection to confirm a reasonable white point for each certified system will be part of the certification process.

C Metrological Evaluation

In order for a particular display to be eligible for certification, it must pass the following uniformity requirements:

- The luminosity uniformity relative to the center of the display must lie within a tolerance of +/- 10.0% Y at RGB=255, +/- 13.3% at RGB=128, +/- 15% at RGB=64.
- The gray balance uniformity must lie within +/- 0.005 in units of CIE1976Lu'v' for all the above levels of gray.

Uniformity will be measured with a 3x3 grid of locations across the display that are equally spaced from each other and from the edges of the display. Refer to ISO 12646 for details of this test.

In order for a soft proofing system to be considered for certification, the Manufacturer must provide a pass/fail uniformity check with their software to ensure that a particular display is in compliance with the uniformity tolerances specified above. This uniformity check must occur at least the first time calibration is performed on a display. For purposes of auditing, the uniformity check must provide text readable data in units of Yu'v' for each measurement in the form of a sequential list beginning with the upper left corner for RGB=255, proceeding left to right, top to bottom, RGB=255, 128, and 64 and ending with the lower right corner at RGB=64.

If the vender provides an external correction for uniformity and wishes to measure uniformity utilizing that correction, the procedure for enabling the correction must be defined in the application data sheet, and the Manufacturing Contractor will test this procedure when

they perform the certification process. The Manufacturer may perform the uniformity check utilizing the correction in order to enable a larger population of displays to pass uniformity.

The Evaluation Contractor will confirm that the uniformity data documented by the Manufacturer is accurate via external audit. If the Manufacturer is claiming to perform uniformity correction, the Evaluation Contractor must display the test images used for auditing using the Manufacturer's proofing system in order to ensure that the Manufacturer's correction is being applied. The audit will be based on the calculated differences of the values of Yu'v' rather than on the absolute values of Yu'v' since venders may use a different measurement device for performing the uniformity check than the one used for certification. For example, the Manufacturer may use the same device already provided with their system for purposes of calibration.

The Manufacturer must also provide a means of indicating with their system that a particular display is both "Calibrated/Uncalibrated" and also "Uniform/Not Uniform" when viewing images in color accurate mode. The combination of "Calibrated" and "Uniform" together with the appropriate ICC profile constitutes the requirement for "IDEAlliance Certified" for a particular CMYK proofing standard.

Once the Evaluation Contractor has confirmed that the Manufacturer has a valid uniformity check procedure, they will proceed to the next phase of certification which is confirming accurate color at the center of the display.

A subset of the CMYK values of the patches in the IT8.7/4 certification target area of the test image will be displayed and measured using a known traceable (see Annex D) spectrophotometer (per ISO 15790) supplied by the Evaluation Contractor and compared to its respective goal characterization data set. Measurements will be taken by the standard Eye-One Pro spectrophotometer supplied by the Evaluation Contractor. The Evaluation Contractor should confirm prior to each certification that the device is measuring accurately relative to a secondary reference device such as a Photo Research PR-650. The comparative validation measurements can be performed on a small set of colors such as white (RGB=100%) and all combinations of 100% R,G,B for a total of 8 measurements and the comparative values documented along with the other measurements performed during certification. This step is necessary due to the fact that unlike reflective measurement, maintaining calibration of emissive instruments is difficult due to the lack of equivalent reference plaques.

Each Manufacturer is responsible for providing a software application for automated on-screen measurements of the monitor proofing system being certified. The application must provide a text readable file containing (at least) the CMYK values of each measured color and the corresponding measured XYZ and L*a*b*.

The Evaluation Contractor will confirm that the measurements performed by the supplied application are an accurate representation of the monitor proofing system by performing an audit. The audit will entail manual measurements of a small set of CMYK colors at approximately the same location used by the automated application. The procedure for the audit is as follows:

- Load the audit CMYK test file into the proofing system,

- Assign the CMYK profile provided by the Manufacturer to the test file,
- Display the image in Actual Size mode according to the Manufacturer's instructions,
- Calibrate the EyeOne Pro and position the device at approximately the same location as the location used by the automatic measurement application,
- Proceed to measure and record the values of XYZ and L*a*b* for each patch,
- Document the resulting measurements and compare with the corresponding measurements stored in the text file saved from the automatic measurement application.

The audit will be considered a "pass" if the agreement between the archived data and the audit data is within the noise of the measurement device plus drift of the display. RIT, the current Evaluation Contractor, will determine noise of measurement in order to confirm passing of the audit. This estimate will account for instrument noise, mount/dismount error, as well as drift of display over two hours and drift of instrument over two hours. The estimate should be based on accepted methods of determining measurement noise such as the calculation of standard deviation for multiple measurements. Automatic measurements should lie within a 99% confidence level of corresponding audit measurements.

Note that in order to calculate L*a*b*, the white point of the display (RGB=100%) must also be measured and used in lieu of the values of D50 for XnYnZn in the CIELAB equations. If the Manufacturer's proofing system does not support RGB files, the Manufacturer must provide a means of displaying RGB white of the display within the context of their system. This can be added for example as a feature in the automated measurement tool.

Note that all values of L*a*b* are to be calculated using the measured RGB white point of the display that is set by the monitor proofing system rather than D50. In other words, the measured values of XYZ for the white of the display (RGB=100%) are to be used in lieu of D50 XnYnZn in the calculations for CIELAB. This means that the white point of the display should always measure L*a*b*= (100, 0, 0).

NOTE: In the event that the measurement device is removed and repositioned on the display, a new measurement of the white reference must be made for calculating L*a*b*. This is to ensure that variability due to surface uniformity is kept separate from accuracy of calibration and color management.

Six (6) numeric criteria must be met in order for a system to be deemed to have passed certification and to be labeled as "SWOP Certified."

- (1) The difference between the characterization data set and the IT8/7.4 target is an average delta $E_{2000} \leq 2.0$ for all patches and (2) a maximum delta $E_{2000} \leq 6.0$ for at least 95% of all patches.
- (3) Solid patches cyan, magenta, yellow, red green and blue on the IT/7.4 are delta $E_{2000} \leq 7.0$ from the characterization data set.
- (4) Differences between the characterization data set and patches on the IT8/7.4 target has white point of a delta L +/-2.0, a delta a +/-1.0 and a delta b +/-2.0.
- (5) Difference between the 50/40/40 gray balance target and the characterization data set has a delta E +/-2.0, a delta a +/-1.0 and a delta b +/-2.0.

D Reporting Results

Results will be reported within 3 working days of the conclusion of the Metrological

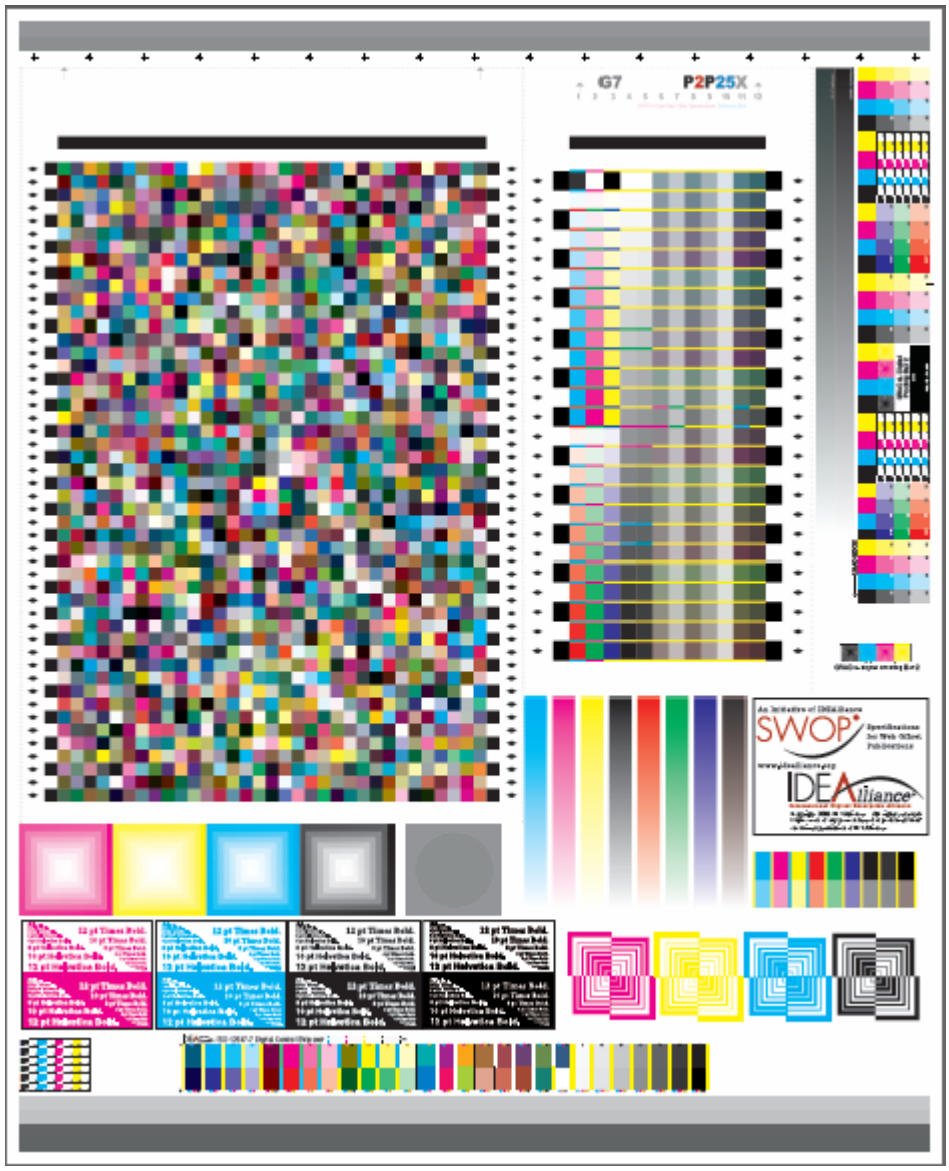
E Posting Results

1. Manufacturer's monitor proofing systems which have successfully passed certification will be notified.
2. Such systems will be listed on the IDEAlliance website and the corresponding ADS will be posted.
3. Manufacturers will be provided with the IDEAlliance SWOP/GRACoL certification logo and rules for use on their websites and marketing materials.

NOTE: The Print Properties Working Group defines the tolerances for the proofing system certification program. The Print Property Working Group reserves the right to adjust these tolerances on an annual basis to reflect industry trends.

ANNEX A –TEST FORM CONTENT

The proofing test form will consist of two (2) pages that together make up the required form content.



Sheet 1 of 2

Sheet 2 of 2

ANNEX B – Application Form

Join IDEAlliance

An Initiative of IDEAlliance SWOP® Specifications Web Offset Publications

GRACoL®

Application for Proofing Certification

Instructions: Please complete and submit this form to apply for Proofing System Certification .

- **Monitor Proofing** Certification to be scheduled.
- **Hard Copy** Certification is Ongoing. You may submit the application at any time.
- You will be invoiced for the entire amount of the certification following submission of this form.
- The **entire** certification fee must be paid before the certification date. The fee covers two trials.

1. Name of the system you are certifying

NOTE: Specify the name of hard copy proofing systems as: *Manufacturer/System or RIP/Output Device/*. A manufacturer may change substrate with the Characterization Data Set if multiple certification categories are being tested. An ADS is required for each. Specify the name of a monitor proofing system as *Manufacturer/System or RIP/ Display/* Certification Categories are SWOP#3, SWOP#5 and GRACoL#1

2. What type of proofing system are you certifying?

☐ Hard Copy

☐ Monitor

3. What Certification Category are you applying for?

☐ SWOP#3 Substrate: _____

☐ SWOP#5 Substrate: _____

☐ GRACoL#1 Substrate: _____

4. MANUFACTURER Submitting the Application

5. NAME of Person Submitting the Application

6. EMAIL of Person Submitting the Application

7. STREET ADDRESS

8. CITY, STATE ZIP

9. TELEPHONE

10. FAX

11. NAME and TITLE of Person AUTHORIZING the ApplicationAND PAYMENT

12. Are you an IDEAlliance Member?

☐ Yes

☐ No

Submit Reset

ANNEX C – Visual Inspection Check List

PROOFING CERTIFICATION INITIAL CHECK LIST

Hard Copy Proof Characteristic	Monitor	Page 1	Page 2
Hickies/Voids/Scuffs/Folds		____	____
Uniformity across/around Image	X	____	____
Banding	X	____	____
Moiree/Patterning	X	____	____
Paper Color	X	____	____
Neutral Color and Weight	X	____	____
General Proof Color	X	____	____
Highlight Detail (Tone Transition/Resolution)	X	____	____
Shadow Detail (Tone Transition/Resolution)	X	____	____
Other _____	?	____	____

1 = Looks like Reference Proofs
2 = We see some defect but are not sure that it is significant by comparison
3 = We are reasonable sure that this defect would affect measurement
or image evaluation

ANNEX D – Contractor Measurement Instruments

1 Hard Copy

The DPT70 is currently used for hard copy proofing systems certification. The reference instrument is carefully maintained and calibrated with assistance from X-Rite.

2 Monitor

The Eye1 is currently used for monitor proofing systems certification. The reference instrument is carefully maintained and calibrated with assistance from X-Rite.

ANNEX E – Goals and Tolerances
SWOP #5 Publication

Metrological Criteria

IT8/7.4	INPUT VALUES				GOAL VALUES			TOLERANCES		
Patch #	C	M	Y	K	L	a	b	Hard Cert dE(ab)	Soft Cert dE(00)	ISO dEab
Ave All								≤1.5	≤2.0	≤3.0
MAX 95%								≤6.0	≤7.0	na
Solids								≤5.0	≤6.0	na
Gray	50	40	40					≤1.5	≤1.5	na
Whitepoint					±2.0	±1.0	±2.0			

Paper Specification

	#	gsm	brightness	opacity	gloss
Monterey Gloss	36	53	72	88	48
	38	56	72	88	480
	40	59	72	89	50
	45	67	72	90	55
	50	74	72	91	58
	55	81	72	91	58
	60	89	72	92	58
	70	104	72	94	58

Line Screen: 133
TAC: 300

Metrological Goals

Patch #	C	M	Y	K	L	a	b
IT8/7.4	INPUT VALUES				GOAL VALUES		
1	0	100	20	0	47.6	68.63	5.74
2	0	85	20	0	52.16	58.99	6.49
3	0	70	20	0	57.79	47.63	7.71
4	0	55	20	0	63.96	36.26	9.31
5	0	40	20	0	70.52	25.01	11.43
6	0	30	20	0	75.03	18	13.14
7	0	20	20	0	79.65	11.08	15.02
8	0	10	20	0	84.09	4.56	16.98
9	0	0	20	0	88.65	-1.91	18.99
10	0	100	10	0	47.58	69.27	1.13
11	0	85	10	0	52.24	59.62	1.59
12	0	70	10	0	57.97	48.29	2.48
13	0	55	10	0	64.19	36.92	3.64
14	0	40	10	0	70.88	25.81	5.36
15	0	30	10	0	75.42	18.79	6.71
PLUG IN VALUES FROM CHARACTERIZATION DATA SET HERE!							

ANNEX F – Goals and Tolerances
SWOP #3 Publication

Metrological Criteria

IT8/7.4	INPUT VALUES				GOAL VALUES			TOLERANCES		
Patch #	C	M	Y	K	L	a	b	Hard Cert dE(ab)	Soft Cert dE(00)	ISO dEab
Ave All								≤1.5	≤2.0	≤3.0
MAX 95%								≤6.0	≤7.0	na
Solids								≤5.0	≤6.0	na
Gray	50	40	40					≤1.5	≤1.5	na
Whitepoint					±2.0	±1.0	±2.0			

Paper Specification

	#	gsm	brightness	opacity	gloss
Fortune Gloss	60	89	88	91	70
	70	104	88	92	70
	80	118	88	94	70
	100	148	88	95	70

Line Screen: 150
TAC: 310

Metrological Goals

Patch #	C	M	Y	K	L	a	b
IT8/7.4	INPUT VALUES				GOAL VALUES		
PLUG IN VALUES FROM CHARACTERIZATION DATA SET HERE!							

ANNEX G – Goals and Tolerances
GRACoL #1 Commercial

Metrological Criteria

IT8/7.4	INPUT VALUES				GOAL VALUES			TOLERANCES		
Patch #	C	M	Y	K	L	a	b	Hard Cert dE(ab)	Soft Cert dE(00)	ISO dEab
Ave All								≤1.5	≤2.0	≤3.0
MAX 95%								≤6.0	≤7.0	na
Solids								≤5.0	≤6.0	na
Gray	50	40	40					≤1.5	≤1.5	na
Whitepoint					±2.0	±1.0	±2.0			

Line Screen: 175
TAC: 320

Metrological Goals

Patch #	C	M	Y	K	L	a	b
IT8/7.4	INPUT VALUES				GOAL VALUES		
PLUG IN VALUES FROM CHARACTERIZATION DATA SET HERE!							

ANNEX H – ADS Template for Hard-Copy Systems

Vendor Logo Here	IDEAlliance places logo with date here

Off-Press Proof Application Data Sheet

Proofing System Name Here (include category)

The IDEAlliance Print Properties Working Group has established a certification process for off-press proofs as input material to publications. In accordance with this process: "The appearance of a hard copy or monitor proof used in this application must have the ability to closely match specific CGATS or other documented characterization data sets within outlined tolerances. See further explanations and recommendations outlined on www.swop.org or www.gracol.org.

The following information is intended to assist producers and consumers in the use of vendor specified proofing materials in an off-press proof application:

I. Manufacturer

Manufacturer's name and address is listed here.

II. Product

Note: This must be a unique descriptor of the proofing system to be certified. Specify the name of the hard copy proofing systems as: *Manufacturer/System or RIP/Output Device/ Substrate/ Inks/ Certification Category*. Specify the name of the monitor proofing system as *Manufacturer/System or RIP/ Display/ Certification Category*.

III. Introduction

(Introductory statements left to the manufacturer's discretion; used to identify or explain purpose and use of the product. This must NOT include blatant advertising of the entire system's supposed attributes and benefits, but rather a simple explanation of the system technology and uses.

IV. Control Guide

IDEAlliance specifies a control guide such as an ISO 12647-7 Digital Control Strip 2007 be supplied on every off-press proof. As a minimum, the guide used for proofing applications should contain solids for the primary process colors (YMCK), two-color overprints (RGB) and a three-color overprint (YMC), as well as 25%, 50%, and 75% tints in stated line screen resolution of each of the primary process colors and 3-color gray patches. All control guides should be checked for accuracy of the original values. Use and interpretation of a control guide is the responsibility of the creator.

V. System Components

Note: This section shall include a list of all system components specific to generating a proof with those procedures deemed necessary for a proof to conform to the color characteristics listed in Section VII.

VI. Finishing Procedures

Note: This section shall include a list of any necessary finishing instructions in order for the (Vendor's product) to conform to this Application Data Sheet. (Coatings, de-glossing, drying times, etc.)

VII. Finished Proof Characteristics

A proof with the color characteristics referenced in Appendix 1 is to be expected when measured from the ADS Proofing Certification Strip having been properly made to all the listed system components and finishing procedures.

Note: Three-color grays are comprised of Cyan, Magenta, Yellow: 75, 66, 66; 50, 40, 40; and 25, 19, 19 values.

Note: State the measurement device used to compare CIELab data and if a UV filter or no UV filter was employed.

VIII. Sample Proofs

(XXX Vendor) has supplied three (3) sets of hard copy proofs for retention or has had their monitor system verified that it conforms to this Application Data Sheet by an IDEAlliance certifying contractor.

IX. Additional Proof Data

Note: Additional proof data came be added in this section for clarification of specific proof detail or legacy information such as TVI, Print Contrast, Trap, or other colorimetric information.

ANNEX I – ADS Template for Monitor Systems

Vendor Logo Here	IDEAlliance places logo with date here

IDEAlliance® **Off-Press Proof Application Data Sheet**

Proofing System Name Here (include category)

The IDEAlliance Print Properties Working Group has established a certification process for off-press proofs as input material to publications. In accordance with this process: "The appearance of a hard copy or monitor proof used in this application must have the ability to closely match specific CGATS or other documented characterization data sets within outlined tolerances. See further explanations and recommendations outlined on www.swop.org or www.gracol.org.

NOTE: It is important for the industry to understand that performing certification on any one display with any one monitor proofing system does not necessarily guarantee the same result on a different display of the same model of monitor. IDEAlliance notes that each monitor of a particular brand and model is unique. That is, for any given brand of monitor, while our experience in certification shows that while most displays pass the ISO criteria, an individual monitor may fail the ISO criteria due to manufacturing issues or may fail at some point in the future as a result of use. IDEAlliance therefore recommends that in addition to calibrating each monitor routinely, users should also verify the uniformity of the display over time as well. The monitor proofing systems vendors have agreed to provide a monitor uniformity test with their system and over the next 12 months will implement software to automate that process for users.

The following information is intended to assist producers and consumers in the use of vendor specified proofing materials in an off-press proof application:

I. Manufacturer

Manufacturer's name and address is listed here.

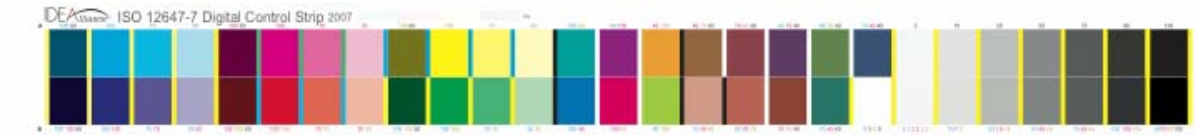
II. Product

Note: This must be a unique descriptor of the proofing system to be certified. Specify the name of the hard copy proofing systems as: *Manufacturer/System or RIP/Output Device/ Substrate/ Inks/ Certification Category*. Specify the name of the monitor proofing system as *Manufacturer/System or RIP/ Display/ Certification Category*.

III. Introduction

(Introductory statements left to the manufacturer's discretion; used to identify or explain purpose and use of the product. This must NOT include blatant advertising of the entire system's supposed attributes and benefits, but rather a simple explanation of the system technology and uses.

IV. Control Guide



IDEAlliance specifies a control guide such as an ISO 12647-7 Digital Control Strip 2007 be supplied on every off-press proof. As a minimum, the guide used for proofing applications should contain solids for the primary process colors (YMCK), two-color overprints (RGB) and a three-color overprint (YMC), as well as 25%, 50%, and 75% tints in stated line screen resolution of each of the primary process colors and 3-color gray patches. All control guides should be checked for accuracy of the original values. Use and interpretation of a control guide is the responsibility of the creator.

Note: Here the manufacturer should indicate the manual or automatic procedure for performing measurements of the color patches used in the ADS Proofing Certification Strip. If the procedure is automatic, the manufacturer should indicate how the user should confirm that the settings for a particular proof are correct in order to correspond to the automatically measured colors.

V. System Components

Note: This section shall include a list of all system components specific to generating a proof with those procedures deemed necessary for a proof to conform to the color characteristics listed in Section VII.

VI. Finishing Procedures

Note: This section shall include a list of any necessary finishing instructions in order for the (Vendor's product) to conform to this Application Data Sheet. (Coatings, de-glossing, drying times, etc.)

VII. Finished Proof Characteristics

A proof with the color characteristics referenced in Appendix 1 is to be expected when measured from the ADS Proofing Certification Strip having been properly made to all the listed system components and finishing procedures.

Note: Three-color grays are comprised of Cyan, Magenta, Yellow: 75, 66, 66; 50, 40, 40; and 25, 19, 19 values.

A Gretag-Macbeth EyeOne Pro spectrophotometer was used to perform the measurements.

Note: Indicate here the manual or automated measurement procedure recommended by the manufacturer as the preferred method for confirming finished proof characteristics. The vender may simply define the procedure and reference Appendix 1 using the same measurement device cited above, or may optionally define alternate expected values and tolerances using a device provided by the manufacturer. Note that in the latter case, measured values may differ from Appendix 1 due to systematic differences in measurement devices and/or due to the inclusion of the effects of gamut clipping.

VIII. Sample Proofs

(XXX Vendor) has supplied three (3) sets of hard copy proofs for retention or has had their monitor system verified that it conforms to this Application Data Sheet by an IDEAlliance certifying contractor.

IX. Additional Proof Data

Note: Additional proof data came be added in this section for clarification of specific proof detail or legacy information such as TVI, Print Contrast, Trap, or other colorimetric information.

ANNEX J – Characterization Data CIELab Values for Coated #1

IDEAlliance ISO 12647-7 Digital Control Strip 2007 for GRACoL 2006 Coated #1

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE -2000
A1	30.05	-22.65	-28.82	-
A2	54.96	-37.12	-50.00	7
A3	66.60	-25.13	-37.01	-
A4	82.64	-9.99	-17.85	-
A5	26.45	41.59	-1.73	-
A6	47.93	74.11	-3.01	7
A7	60.35	51.93	-5.67	-
A8	80.03	20.38	-5.35	-
A9	48.53	-5.30	49.19	-
A10	88.94	-5.02	93.17	7
A11	90.56	-4.57	63.58	-
A12	92.84	-2.51	24.77	-
A13	52.53	-53.19	-19.34	-
A14	37.89	52.56	-22.07	-
A15	70.88	22.91	72.40	-
A16	50.86	15.13	33.06	-
A17	42.17	33.42	13.25	-
A18	34.60	23.09	-17.15	-
A19	52.45	-18.04	26.12	-
A20	36.56	-1.43	-26.62	-
A21	92.88	-0.08	-1.96	-
A22	87.93	-0.20	-1.98	-
A23	77.43	-0.40	-1.93	-
A24	59.77	-0.53	-1.61	-
A25	39.75	-0.57	-1.02	-
A26	25.57	-0.21	-0.53	-

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE -2000
B1	15.18	8.84	-24.61	-
B2	24.13	17.20	-46.14	7
B3	40.84	17.09	-35.77	-
B4	69.57	8.37	-19.26	-
B5	26.22	35.38	24.54	-
B6	47.37	68.25	48.79	7
B7	59.09	47.55	39.25	-
B8	78.62	17.92	18.20	-
B9	28.47	-39.38	12.04	-
B10	50.12	-68.43	25.00	7
B11	62.69	-41.44	20.96	-
B12	80.64	-14.75	8.25	-
B13	42.57	-16.27	-48.19	-
B14	48.28	70.95	17.76	-
B15	72.70	-25.21	65.09	-
B16	70.23	19.71	18.63	-
B17	53.40	36.61	28.63	-
B18	41.61	32.01	26.83	-
B19	45.40	-26.20	-3.82	-
B20	95.00	-0.02	-1.96	3
B21	92.43	0.19	-2.06	-
B22	86.74	0.31	-2.04	-
B23	75.52	0.07	-1.50	-
B24	57.54	-0.12	-1.44	3
B25	39.39	-0.30	-0.55	-
B26	23.00	0.17	-0.25	-

Note: Color is measured with a calibrated EyeOne Pro spectrophotometer.

ANNEX K – Characterization Data CIELab Values for Coated #3

IDEAlliance ISO 12647-7 Digital Control Strip 2007 for SWOP 2006 Coated #3

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE-2000
A1	31.96	-21.01	-26.32	-
A2	56.99	-37.23	-44.95	7
A3	66.07	-27.13	-33.53	-
A4	80.52	-11.80	-15.33	-
A5	25.80	40.75	-2.90	-
A6	47.84	72.08	-3.11	7
A7	58.95	51.61	-4.46	-
A8	78.03	20.64	-3.18	-
A9	47.67	-4.29	45.76	-
A10	87.97	-5.03	88.10	7
A11	89.28	-5.09	62.78	-
A12	91.24	-2.93	25.28	-
A13	54.86	-51.51	-16.56	-
A14	38.04	51.19	-21.63	-
A15	69.74	23.44	67.23	-
A16	49.55	15.84	31.56	-
A17	40.89	33.29	12.00	-
A18	34.01	22.69	-16.52	-
A19	52.24	-17.96	25.88	-
A20	36.91	-2.13	-25.08	-
A21	90.46	-0.06	-0.21	-
A22	85.69	-0.18	-0.70	-
A23	75.49	-0.39	-1.61	-
A24	58.21	-0.51	-2.27	-
A25	39.28	-0.34	-1.80	-
A26	26.88	-0.14	-0.89	-

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE -2000
B1	15.57	11.13	-25.12	-
B2	26.85	18.10	-44.32	7
B3	40.85	16.19	-34.08	-
B4	67.49	7.60	-17.17	-
B5	25.19	35.01	22.46	-
B6	46.86	66.21	45.03	7
B7	57.68	47.17	37.42	-
B8	77.94	18.06	18.43	-
B9	29.42	-36.88	12.46	-
B10	52.12	-64.75	24.83	7
B11	63.15	-41.26	21.06	-
B12	79.23	-15.72	8.94	-
B13	44.63	-16.62	-44.13	-
B14	47.87	69.02	16.49	-
B15	72.78	-24.61	60.84	-
B16	68.56	20.02	18.67	-
B17	52.11	36.50	27.30	-
B18	40.29	32.11	25.13	-
B19	45.95	-26.09	-3.01	-
B20	92.50	0.00	0.00	3
B21	90.08	-0.02	-0.08	-
B22	84.59	-0.04	-0.22	-
B23	73.54	-0.15	-0.48	-
B24	56.29	-0.48	-0.41	3
B25	39.80	-0.33	0.14	-
B26	24.79	0.22	-0.52	-

Note: Color is measured with an EyeOne Pro spectrophotometer.

ANNEX L – Characterization Data CIELab Values for Coated #5

IDEAlliance ISO 12647-7 Digital Control Strip 2007 for SWOP 2006 Coated #5

Patch ID Top	CIELab Data			Maximum
	L*	a*	b*	ΔE -2000
A1	32.65	-22.26	-23.31	-
A2	56.56	-37.98	-40.93	7
A3	64.70	-26.67	-29.70	-
A4	78.29	-11.19	-11.42	-
A5	26.42	40.29	-3.23	-
A6	47.64	69.97	-3.54	7
A7	58.14	49.08	-2.95	-
A8	75.88	19.59	0.11	-
A9	47.09	-4.83	44.51	-
A10	85.43	-5.82	84.62	7
A11	86.28	-5.18	60.33	-
A12	88.09	-2.76	26.91	-
A13	54.38	-50.05	-13.62	-
A14	37.79	50.15	-21.11	-
A15	68.36	21.69	65.39	-
A16	48.86	15.14	31.31	-
A17	40.69	32.61	12.52	-
A18	33.04	22.15	-14.98	-
A19	51.08	-17.54	25.50	-
A20	36.75	-2.64	-22.16	-
A21	87.97	-0.06	3.85	-
A22	83.35	-0.16	3.31	-
A23	73.53	-0.34	2.37	-
A24	56.84	-0.35	1.34	-
A25	38.89	0.04	0.98	-
A26	27.07	0.55	1.06	-

Patch ID Bottom	CIELab Data			Maximum
	L*	a*	b*	ΔE -2000
B1	15.76	11.76	-23.91	-
B2	26.54	18.56	-42.01	7
B3	40.30	15.39	-31.31	-
B4	65.80	7.14	-13.75	-
B5	26.49	34.78	21.45	-
B6	47.43	64.38	42.74	6
B7	57.01	44.95	36.24	-
B8	74.61	17.32	19.99	-
B9	30.65	-35.02	14.67	-
B10	52.26	-61.49	26.76	7
B11	61.52	-39.10	20.93	-
B12	76.68	-14.80	10.89	-
B13	44.23	-17.41	-40.21	-
B14	47.52	67.23	15.19	-
B15	70.77	-24.24	58.75	-
B16	66.70	19.12	19.70	-
B17	51.52	34.92	26.64	-
B18	40.31	31.25	24.75	-
B19	45.31	-25.37	-1.12	-
B20	90.06	-0.01	4.14	3
B21	87.67	0.00	3.75	-
B22	82.19	-0.02	3.09	-
B23	71.47	-0.07	2.12	-
B24	54.70	-0.44	1.24	3
B25	39.10	-0.23	1.19	-
B26	24.73	0.21	-0.12	-

Note: Color is measured with an EyeOne Pro spectrophotometer.

ANNEX M – Differences Between Hard Copy and Monitor Certification

This Annex intends to explain the three key differences between certification for monitor proofing and certification for hard copy proofing.
These differences are:

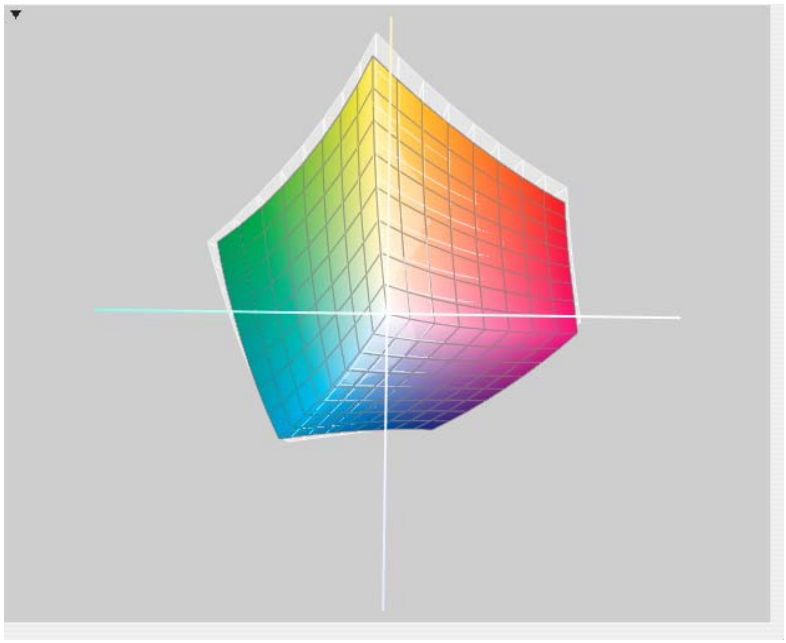
1. Normalizing all CIELAB calculations to the white point of the display rather than standard D50 white
2. The use of delta E 2000 as the metric for calculating color differences
3. The use of slightly higher tolerances for average error and 100% colors

A Normalizing the Reference White Point of CIELAB to Display White

Several studies seem to indicate that a preferred match to white balance occurs between hard copies in a viewer and images on a display when the display is calibrated to a higher color temperature than D50. This unexpected result appears to lie in the fact that the spectra of displays are significantly different than the spectra of colored inks in a D50 viewer. For example, see the references to monitor white vs. D50 in the UGRA reference below, as well as the reference below to Fairchild's excellent book "Color Appearance Models."
Research is underway to reconcile this discrepancy. Until a satisfactory improvement to current CIELAB calculations is determined, the IDEAlliance specification addresses this issue by defining the calibrated white of the display to be the measured white reference used in the equations for CIELAB. The normalization must ensure that the calibrated white of the display results in a value of L*a*b* = 100,0,0 much as a perfect white reflector in a D50 viewer is defined to be L*a*b* = 100,0,0. If improvements to CIELAB are successful in the future, identical measurements between white points of viewer and display should result in acceptable visual match, in which case an identical value of reference white will be used for both hard copy and soft proof CIELAB calculations.

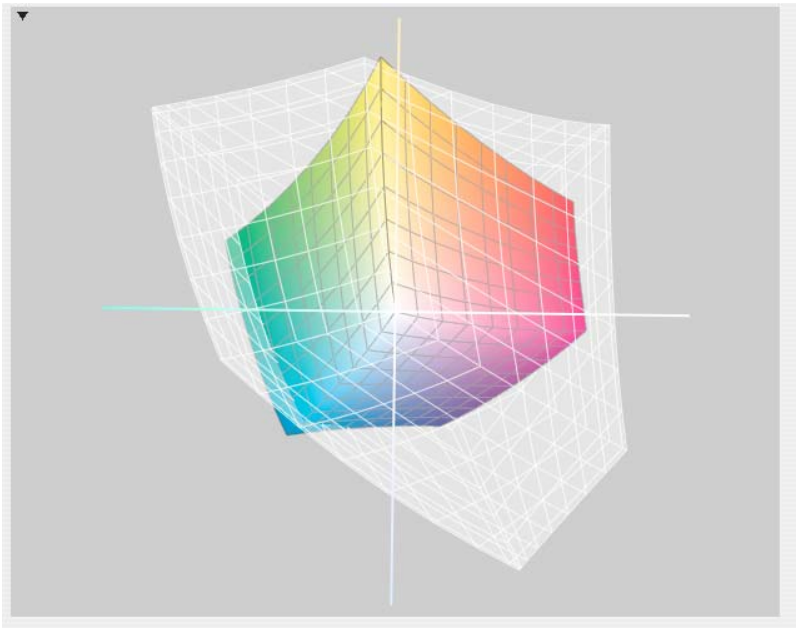
B Use of Delta E (2000) Rather than Delta E (1976)

The historic use of deltaE (1976) has been reasonably successful due to the similar gamut shapes of different print media. For example, consider the following comparison between GRACOl_C1 and SWOP_C3:



GRACol vs. SWOP_C3

The same is not true in comparing the gamuts of displays and the gamuts of hard copies. Consider for example the dramatic difference between a typical flat panel display used in the industry and SWOP_C3:



Typical LCD Gamut vs. SWOP_C3

Thus, when two print gamuts differ in a particular saturated color (such as magenta or cyan) by 10 delta E (1976), the visual impact can be significant because the error is typically in both L* and C* due to such factors as ink contamination, i.e. the ink of the smaller gamut printer is “dirtier” than the ink of the bigger gamut print condition.

By contrast, errors between the gamuts of monitor proofs and hard copy proofs often lie primarily in the direction of chroma (C*). This occurs due to a lack of RGB chromaticity as opposed to ink purity. Furthermore, the most significant clipping occurs in cyan, where lack of chroma is less visible than other colors such as red. The reduced sensitivity of the eye to error in chroma (as opposed to L* or hue) is reflected in the calculations for both deltaE (1994) and deltaE (2000).

C Use of Slightly Higher Tolerances for Average Delta E and Delta E of Solids

The slightly higher tolerances for average Delta E occur due to the fact that corrections to chromatic colors may be required due to the imperfections with CIELAB mentioned above regarding monitor white vs. D50 white. In the previously mentioned UGRA reference below, it notes that a Bradford chromatic adaptation should be performed as a result of the white point correction. Other studies indicate that corrections to CIELAB must be determined in chromatic colors (see Shaw and Fairchild below, as well as Kodak patent #7,209,147 for an in-depth discussion). To account for this phenomenon, slightly higher tolerances must be used for both average delta E and the delta E of solids. It should be understood that these slightly larger tolerances will be reduced when improvements to CIELAB have been confirmed, along with an objective specification and tolerance for white point.

References

a. User's Guide and Technical White Paper for the UGRA Display Analysis and Certification
b. Shaw. M. and Fairchild, M.D. Evaluating the CIE 1931 color matching functions *Color Research and Application 27, 316-329 (2002)*
c. US Patent #7,209,147 "Correction Techniques for Soft Proofing"
d. Fairchild "Color Appearance Models", Addison-Wesley, 1997, pp. 188-189