



Monitor Proof Application Data Sheet

BenQ Soft Proofing System using BenQ PG2401PT, Palette Master Software and Adobe Acrobat XI Pro for GRACoL Coated #1

Note: Certification Categories are: GRACoL Coated #1, SWOP Coated #3 and SWOP Coated #5

The IDEAlliance Print Properties Working Group has established a certification process for monitor proofs. In accordance with this process the appearance of a monitor proof must have the ability to closely simulate specific CGATS or other documented characterization data sets within tolerances outlined in this document.

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 provide 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 a monitor proofing application:



Certified on June 5, 2013

I. Manufacturer

BenQ Corporation
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II. Product

BenQ Soft Proofing System using BenQ PG2401PT and Palette Master Software for GRACoL Coated # 1

III. Introduction

BenQ's new Professional Monitor, PG2401PT, is designed for graphics art professionals who require high color fidelity from a 24" LED backlight monitor. PG2401PT is a hardware calibration capable LED monitor with 99% coverage rate of the industry standard Adobe RGB color gamut. That means almost every color specified in GRACoL 2006 Coated # 1 printing condition can be covered by PG2401PT. With built-in uniformity correction function, more than 90% in uniformity can be achieved. Internal 3D LUT and gamma correction, together with BenQ Palette Master Calibration software and Adobe Acrobat XI Pro, ensure PG2401PT is capable of delivering a close match between the colors displayed on the monitor and the hardcopy print.

IV. Control Guide

IDEAlliance specifies that a Control Guide: the IDEAlliance ISO 12647-7 Digital Control Strip, or a similar target containing the same patches or a super-set thereof or a progression of the same patches displayed sequentially, able to be displayed and measured on every certified monitor proofing system. The control guide file should be checked for accuracy of the original CMYK percentage values, as listed in the Annex.



NOTE: The IDEAlliance ISO 12647-7 Digital Control Strip 2008 supercedes any previous ADS Proofing Certification Strip for conformance to this process. The control guide can be downloaded from the IDEAlliance.org web site. Practical production tolerances are discussed in the **Read Me** file included with the Control Guide.

The rendered control guide shall adhere to the appropriate characterization data and tolerances shown in the Annex.

Note: Include only one Annex to the Application Data Sheet for the appropriate data set certification.

Palette Master software is set up to automatically display the patches of the IDEAlliance Control Strip and measure the same test chart. Prior to conducting the verification procedure, a monitor ICC profile should be constructed with the target of D50, 120 nits, Adobe RGB, and gamma 2.2. The verification procedure is done through the "Quality" section in "Advanced" mode. The "Patch Set Type" should be set to "Standard", "Industry Standard Targets" should be set to "IDEAlliance ISO 12647-7 2009", and "References" should be set to "GRACoL 2006 Coated 1". The software will automatically display the corresponding color and take measurements. Once the measurements are done, Palette Master will calculate and display the color differences based on ΔE_{2000} color difference calculations.

V. System Components and Manufacturing Procedures

Software: BenQ Palette Master Version 1.0.0 or later

Hardware: BenQ PG2401PT, PC with Windows 7 Professional and above, Mac with Mac OSX 10.7 and above

Measurement Device: X-Rite i1 Pro 2 for calibration and measurement

VI. Finished Proof Characteristics

A proof that has been rendered utilizing the system components and process steps contained in the Application Data Sheet should exhibit the color characteristics referenced in the Annex when measured from the IDEAlliance ISO 12647-7 Digital Control Strip or similar target as described in Section IV.

1. Preparing PG2401PT:
 - 1.1 Turn on the PC and PG2401PT, and warm up PG2401PT for 30 minutes or more, preferably one hour.
 - 1.2 Launch BenQ Palette Master software, go to "Advanced" mode, and select "Profiling".
 - 1.3 Set profiling target as D50, 120 cd/m², Adobe RGB and gamma 2.2.
 - 1.4 Select Calibration 1 as the Target Mode and select Uniformity if enabling Non-uniformity correction function is desired.
 - 1.5 Use X-Rite i1 Pro 2 to calibrate PG2401PT and generate ICC profile.
2. Verifying GRACoL 2006 Coated #1 Data:

2.1 In Palette Master software, go to "Quality" section on the left. Use X-Rite i1 Pro 2 to measure the following data.

2.2 Set "Patch Set Type" to "Standard", "Industry Standard Targets" to "IDEAlliance ISO 12647-7 2009", and "References" to "GRACoL 2006 Coated 1".

2.3 The software will automatically display the corresponding color and take measurements. Once the measurements are done, Palette Master will calculate and display the color differences based on ΔE_{2000} color difference calculations.

2.4 Report can be saved after all measurements are made. The report consists of the color patch CMYK values, target XYZ and Lab values, measured XYZ and Lab values, and ΔE_{2000} color difference.

3. GRACoL Coated #1 Simulation:

3.1 Launch Adobe Acrobat XI Pro and make sure "GRACoL2006_Coated1v2.icc" profile is installed. If not, follow the following steps to install GRACoL Coated 1 ICC profile.

3.1.1 Download GRACoL Coated #1 ICC profile from IDEAlliance website:
<http://www.idealliance.org/downloads/swop-2006-gracol-2006-icc-profiles>

3.1.2 Extract the downloaded file and copy the "GRACoL2006_Coated1v2.icc" to the following folders:

For Windows PC: C:\Program Files\Common Files\Adobe\Color\Profiles\Recommended"

For Mac: Library\ColorSync\Profiles

3.2 Open the PDF file in Adobe Acrobat XI Pro on the calibrated PG2401PT monitor.

3.3 Go to "Tools" → "Print Production" → "Output Preview". In the new dialog window, select GRACoL Coated #1 profile, and also check the checkbox of "Simulate Overprinting", "Simulate Paper Color", and "Simulate Black Ink".

3.4 The PDF will be simulated to the GRACoL Coated #1 printing condition. Make sure the "Output Preview" dialog window is not closed.

4. Uniformity Verification

4.1 In Palette Master software, go to "Quality" section on the left. Use X-Rite i1 Pro 2 to measure the required data.

4.2 Select PG2401PG monitor and select the grid size; 3x3 and 5x5 grid could be selected.

4.3 Follow the on screen instructions to measure required data for uniformity assessment.

4.4 After all data is measured, a report showing the following data at gray level 255, 128 and 63:

- u' v' coordinates and luminance measured for each patch.
- ΔL (%) between each patch and center patch.
- Δ Color Temperature (K) between each patch and center patch.
- $\Delta u'v'$ between each patch and center patch.

Proof Tolerances (Summary)

- Solid cyan, magenta, yellow, black shall be Delta E E2000 ≤ 6.0 from the characterization data set.
- Solid red green and blue shall be Delta E2000 ≤ 6.0 from the characterization data set.
- The difference between the characterization data set white point and the proof white point (excluding fluorescence) shall be no different than; Delta L* +/-2.0, Delta a* +/-1.0, Delta b* +/-2.0 and have a maximum Delta E2000 ≤ 3 .
- The difference between the 3% CMY gray balance patch values and the characterization data set should be Delta Eab ≤ 2.5 or shall be ≤ 3.0 .
- The difference between all (10%, 25%, 50%, 75%) CMY gray balance patch values and the characterization data set should be Delta E2000 ≤ 1.5 or shall be ≤ 2.5 .
- The average difference for all patches in the IDEAlliance ISO 12647-7 Digital Control Strip and the characterization data should be Delta E2000 ≤ 1.5 or shall be ≤ 2.5 .

Note: The verbal forms of should and shall are used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted i.e. shall "is required" and should "is recommended".

VII. Proof Certification

BenQ Corporation has had this monitor system verified that it conforms to this Application Data Sheet by an IDEAlliance certifying contractor.

Annex
Characterization Data Values Per Monitor Certification Process Version 19
IDEAlliance ISO 12647-7 Digital Control Strip 2009 for GRACoL 2006 Coated #1

SampleID	C	M	Y	K	L*	a*	b*	Max ΔE_{2000}
A1	100	0	0	60	30.05	-22.65	-28.82	
B1	100	100	0	60	15.18	8.84	-24.61	
A2	100	0	0	0	54.99	-37.12	-49.98	≤6
B2	100	100	0	0	24.13	17.21	-46.14	≤6
A3	70	0	0	0	66.68	-25.04	-36.91	
B3	70	70	0	0	40.98	17.06	-35.68	
A4	30	0	0	0	82.72	-9.92	-17.75	
B4	30	30	0	0	69.73	8.32	-19.16	
A5	0	100	0	60	26.45	41.59	-1.73	
B5	0	100	100	60	26.22	35.37	24.54	
A6	0	100	0	0	47.96	74.06	-3.03	≤6
B6	0	100	100	0	47.38	68.25	48.8	≤6
A7	0	70	0	0	60.46	51.74	-5.68	
B7	0	70	70	0	59.19	47.4	39.16	
A8	0	30	0	0	80.12	20.24	-5.33	
B8	0	30	30	0	78.72	17.78	18.08	
A9	0	0	100	60	48.52	-5.3	49.18	
B9	100	0	100	60	28.47	-39.37	12.04	
A10	0	0	100	0	88.94	-5.01	93.11	≤6
B10	100	0	100	0	50.12	-68.42	25	≤6
A11	0	0	70	0	90.58	-4.56	63.36	
B11	70	0	70	0	62.79	-41.27	20.92	
A12	0	0	30	0	92.85	-2.49	24.58	
B12	30	0	30	0	80.73	-14.64	8.19	
A13	100	0	40	0	52.53	-53.19	-19.34	
B13	100	40	0	0	42.57	-16.27	-48.19	
A14	40	100	0	0	37.89	52.56	-22.07	
B14	0	100	40	0	48.28	70.95	17.76	
A15	0	40	100	0	70.88	22.91	72.4	
B15	40	0	100	0	72.7	-25.21	65.09	
A16	0	40	70	40	50.87	15.13	32.94	
B16	10	40	40	0	70.17	19.63	18.54	
A17	0	70	40	40	42.23	33.3	13.26	
B17	20	70	70	0	53.49	36.46	28.55	
A18	40	70	0	40	34.66	22.98	-17.15	
B18	0	70	70	40	41.68	31.89	26.77	
A19	40	0	70	40	52.46	-18.03	25.99	
B19	70	0	40	40	45.46	-26.12	-3.74	
A20	70	40	0	40	36.61	-1.37	-26.56	
B20	0	0	0	0	95	-0.02	-1.96	≤3
A21	0	0	0	3	92.81	-0.07	-1.96	
B21	3.1	2.2	2.2	0	92.43	0.19	-2.06	≤3
A22	0	0	0	10	87.79	-0.2	-1.98	
B22	10.2	7.4	7.4	0	86.74	0.31	-2.04	≤2.5
A23	0	0	0	25	77.36	-0.4	-1.93	
B23	25	19	19	0	75.52	0.07	-1.5	≤2.5
A24	0	0	0	50	59.92	-0.53	-1.61	
B24	50	40	40	0	57.69	-0.13	-1.46	≤2.5
A25	0	0	0	75	39.84	-0.57	-1.02	
B25	75	66	66	0	39.39	-0.3	-0.55	≤2.5
A26	0	0	0	90	25.77	-0.22	-0.54	
B26	100	100	100	0	23	0.17	-0.25	
A27	0	0	0	100	14.93	0.21	-0.14	≤6
B27	80	70	70	100	8.46	0.34	0.44	

Note: CIE2000 values for 3-color 3%, 10%, 25% and 75% patches are interpolations of the IT8/7.4 characterization data.