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IDEAlliance

G7 System Certification Application Data Sheet

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Dynamic PrinterCalibration™

The IDEAlliance Print Properties Working Group has established a certification process for G7 Systems. In accordance with this process The G7 System Certification Program is designed to evaluate the ability of a candidate system to calibrate a printing device to meet the G7 greyscale definition using four 1-D Curves within the tolerances outlined in this document. All evaluations are based on the parameters of the G7 Specification (draft 2008). The following information is intended to assist producers and consumers in the use of the vendor system as specified for creating the four 1-D Curves.

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Technology

Alwan Dynamic PrinterCalibration™

Alwan Print Standardizer X® (APSX), is an Industry-First automated Quality Control and Assurance server system for the pressroom. APS relies on Alwan Dynamic PrinterCalibration™ technology and guarantees compliance with G7® Process Control, PSO (Process Standard Offset) and ISO 12647 certification requirements for the pressroom after few days in production.

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Manufacturer Instruction Summary for G7 System Certification

This procedure is dedicated for the certification requirement by simulation only.
In production environment, please refer to the APSX manual for G7® calibration procedure.

1 . Get P2P measurement files

1.1 - Create ICC Profiles based on the three IT8 files supplied by IDEAlliance.

1.2 - Extract CIELab values from each ICC Profile using the original P2P CMYK values (rendering Intent: ***Absolute Colorimetric***). *(Use software like CHROMiX ColorThink Pro or equivalent)*

1.3 - Save Lists in a folder. Save both ***Source*** values (CMYK) and ***Destination*** values (CIELab). Three new P2Ps are now created.

2 . Set up a Queue in Print Standardizer X for G7® Conformance

2.1 - Launch *Alwan Print Standardizer X*, and create three queues for each P2P.

2.2 - Fill out all information required to identify the future 1-D curves created for each P2P in ***Settings/Identification*** tab. (Newspaper, Web Offset, Sheetfed)

2.3 - Define ***General or Queue Input Folder*** in ***Settings/Input*** tab by choosing a convenient location for each queue. (e.g. Desktop)

2.4 - Set appropriate printing conditions in ***Settings/Printing Condition*** tab. Select one printing condition per queue for each P2P as following, then click on ***Apply Selected*** :

- News Simulation_P2P25Xa → ISONewspaper 30v4 + NPDC
- Sheetfed Simulation_P2P25Xa → GRACoL®2006_Coated1v2
- WebOffset Simulation_P2P25Xa → SWOP®Coated3v2

2.5 - Uncheck ***Solids ΔE76 higher than…*** in ***Settings/TRC Calculation*** tab.

2.6 - Select ***CMYK Optimizer/ LinkProfiler*** as ***Export File Format*** in ***Settings/DGC Generation*** tab, then define the export folder location.

2.7 - Select ***G7® Gray Scale*** as assessment criteria in ***Settings/Assessment*** tab.

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3 . Import Measurement data

3.1 - Drag and drop each P2P Measurement *(step 1.3)* into their respective HotFolders specified in ***Input*** tab. *(step 2.3)*

4 . Create 1-D Curves (DGC)

4.1 - Click on ***Generate and Export DGC***, in ***Dynamic DGC*** tab for each queue. Three sets of 1-D curves have now been created an ready to use into their respective folders. *(step 2.6)*

5 . Apply 1-D Curves (DGC) - Simulation

5.1 - Apply the 1-D Curves to original P2P CMYK values. A P2P CMYK Curved is created. This step has to be repeated for the three P2Ps. *(Use software like Microsoft Excel or equivalent)*

5.2 - Extract CIELab values from each ICC Profile using the curved P2Ps CMYK values (rendering Intent: ***Absolute Colorimetric***). *(Use software like CHROMiX ColorThink Pro or equivalent)*

5.3 - Save Lists in a folder. Save both ***Source*** values (CMYK) and ***Destination*** values (CIELab).

5.4 - Merge CIELab values extracted from each P2P CMYK Curved *(step 5.3)* with the original P2P CMYK value. Three P2Ps curved are now created. *(Use software like Microsoft Excel or equivalent)*

6 . Analyze Results

6.1 - Drop each P2P Curved *(step 5.4)* into their respective APSX Input folder. *(Step 2.3).*

6.2 - Check G7® Gray Scale conformance. In ***Reporting*** tab, go to ***Show Report Folder*** and open reports related to each P2P Curved file.

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Validation Process

To validate that the G7 calibration process has been successful, print a target consisting of two gray scales and the CMYK patch values listed in **Appendix A:** shall be printed through the calculated correction curves using the same print settings in use when the calibration was calculated.

For G7 System Certification purposes both the sample and verification "prints" shall be produced by software modeling means to eliminate the possibility of physical printer variation between test prints.

Validating NPDC (CMY and K scales)

To validate NPDC correction, both the K-only scale and the CMY-only scale shall be measured with a densitometer or spectrophotometer and the relative neutral density (ND) values (measured in the "K" or "Visual" channel) shall be recorded for each patch. To obtain relative ND values, either the measuring device shall be zeroed on the substrate, or the white patch neutral density value shall be subtracted from itself and all other patches. The (relative) ND values shall be converted to (relative) L^* by the standard CIE formula in **Appendix B**.

The Delta L^* (ΔL^*) error shall be computed for each patch compared to target values on file with IDEAlliance by the formula in **Appendix B**: The average and maximum ΔL^* must not exceed the IDEAlliance Tolerance values in Table 1, below.

Validating Gray Balance (CMY scale only)

To validate gray balance correction, the CMY-only scale shall be measured with a spectrophotometer and the a^* and b^* values recorded for each patch. The Delta-Ch (ΔCh) error shall be computed for each patch compared to target values on file with IDEAlliance by the formula in **Appendix B**: The average and maximum ΔCh must not exceed the IDEAlliance Tolerance values in Table 1, below.

IDEAlliance G7® Gray Scale Tolerances

Table 1: IDEAlliance required tolerances

Metric	Average	Maximum
ΔCh (CMY only)	≤ 1.5	≤ 3.0
ΔL^* (CMY & K)	≤ 1.5	≤ 3.0

IDEAlliance G7® System Certification Tolerances (Simulation)

Using the 2012 G7 System Certification sample test files and the IDEAlliance Validation Process, *Alwan Print Standardizer X* that relies on *Alwan Dynamic PrinterCalibration™* technology will achieve tolerances equal to or lower than the following.

Table 2: IDEAlliance G7 System Certification required tolerances

Metric	Average	Maximum
ΔCh (CMY only)	≤ 1	≤ 2
ΔL* (CMY & K)	≤ 1	≤ 2

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Appendix A

Column 4 (K only)

SampleID	SAMPLE_NAME	CMYK_C	CMYK_M	CMYK_Y	CMYK_K
1	D1	0	0	0	0
2	D2	0	0	0	1.96
3	D3	0	0	0	3.92
4	D4	0	0	0	5.88
5	D5	0	0	0	7.84
6	D6	0	0	0	10.2
7	D7	0	0	0	14.9
8	D8	0	0	0	20
9	D9	0	0	0	25.1
10	D10	0	0	0	30.2
11	D11	0	0	0	34.9
12	D12	0	0	0	40
13	D13	0	0	0	45.1
14	D14	0	0	0	49.8
15	D15	0	0	0	54.9
16	D16	0	0	0	60
17	D17	0	0	0	65.1
18	D18	0	0	0	69.8
19	D19	0	0	0	74.9
20	D20	0	0	0	80
21	D21	0	0	0	85.1
22	D22	0	0	0	89.8
23	D23	0	0	0	94.9
24	D24	0	0	0	98.04
25	D25	0	0	0	100

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Column 5 (CMY only)

26	E1	0	0	0	0
27	E2	1.96	1.18	1.18	0
28	E3	3.92	2.75	2.75	0
29	E4	5.88	4.31	4.31	0
30	E5	7.84	5.49	5.49	0
31	E6	10.2	7.45	7.45	0
32	E7	14.9	10.98	10.98	0
33	E8	20	14.9	14.9	0
34	E9	25.1	18.82	18.82	0
35	E10	30.2	23.14	23.14	0
36	E11	34.9	27.06	27.06	0
37	E12	40	31.37	31.37	0
38	E13	45.1	35.69	35.69	0
39	E14	49.8	40	40	0
40	E15	54.9	45.1	45.1	0
41	E16	60	50.2	50.2	0
42	E17	65.1	55.29	55.29	0
43	E18	69.8	60.39	60.39	0
44	E19	74.9	65.88	65.88	0
45	E20	80	71.76	71.76	0
46	E21	85.1	78.04	78.04	0
47	E22	89.8	84.31	84.31	0
48	E23	94.9	92.16	92.16	0
49	E24	98.04	96.86	96.86	0
50	E25	100	100	100	0
END_DATA					

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Appendix B

Converting ND to L*

$$Y = 1/10^{ND}$$

if: $Y > (6/29)^3$

$$L^* = 116 \times Y^{1/3} - 16$$

else:

$$L^* = 116 \times (841/108 \times Y + 4/29) - 16$$

Calculating Delta L* (ΔL*)

$$\Delta L^* = (L^*_{\text{sample}} - L^*_{\text{target}})$$

Calculating DeltaCh (ΔCh)

$$\Delta Ch = ((a^*_{\text{sample}} - a^*_{\text{target}})^2 + (b^*_{\text{sample}} - b^*_{\text{target}})^2)^{1/2}$$