



G7® System Certification Application Data Sheet



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.

Manufacturer

Mellow Colour Limited

Unit 51
Basepoint Business Centre
Vale Business Park
Crab Apple Way
Evesham
WR11 1GP
United Kingdom



Product

PrintSpec 4

Powerful print quality management tools for printers and brands.

Testing Instructions (procedures)

G7 preconditions

Essential to successful G7 implementation:

1) Stable and repeatable print condition

A standardised print condition must be reached and maintained. Any deviation from the standardised print condition will result in deviation of the G7 results.

2) Accurate and repeatable measurement

A precision instrument is strongly recommended for measurement of the P2P chart. Accurate and repeatable measurement, comparison, multiple sheets and averaging are all important components of successful G7 implementation (PrintSpec ColourCompare should be used to verify measurement repeatability and accuracy).

3) Accurate implementation of TVI adjustment values

Whether offset, gravure, flexo, digital or other, accurate implementation of TVI adjustment values is essential.

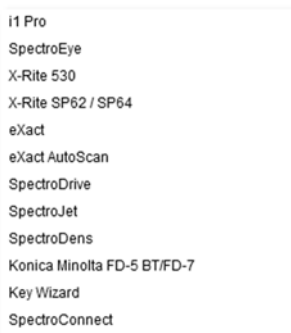
PrintSpec G7 procedure

Print and measure the appropriate P2P chart.

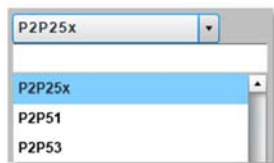
The P2P charts are included on the PrintSpec software FD dongles in Support Files\Test Strips\Other Strips.

They also included in the latest V6 testforms.

Note: it is recommended to print from uncorrected/linear/unadjusted plates (or cylinders) where the job must be produced in a standardised and repeatable print condition (standard target densities/colour values).



Instrument selection in PrintSpec measure page



P2P strip selection in PrintSpec measure page

Calibration (Grey Scale Target) provides TVI (plate/cylinder) adjustment information in a range of sample intervals, variants (Absolute/Deviation) and workflow export options.

Sample Interval 1%																				
Plate					Grey Scale target					Print					Absolute					
	C	M	Y	K	C	M	Y	K	C	M	Y	K	C	M	Y	K	C	M	Y	K
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1.75	1.61	1.68	1.95	1.82	1.81	1.5	1.89	0.96	0.89	1.13	1.03				
2	2	2	2	2	3.51	3.22	3.36	3.88	3.65	3.61	2.99	3.79	1.92	1.78	2.25	2.04				
3	3	3	3	3	5.26	4.83	5.05	5.77	5.47	5.42	4.49	6.02	2.88	2.67	3.38	2.89				
4	4	4	4	4	7.01	6.44	6.73	7.64	7.3	7.22	5.98	8.26	3.84	3.56	4.5	3.72				
5	5	5	5	5	8.77	8.05	8.41	9.47	9.12	9.03	7.48	9.89	4.81	4.46	5.51	4.75				
6	6	6	6	6	10.52	9.66	10.09	11.28	10.79	10.28	9.32	11.52	5.84	5.5	6.42	5.86				
7	7	7	7	7	12.27	11.27	11.78	13.06	12.45	11.53	11.15	12.72	6.89	6.79	7.34	7.29				
8	8	8	8	8	14.03	12.88	13.46	14.82	14.11	12.78	12.99	13.92	7.95	8.08	8.25	8.46				
9	9	9	9	9	15.78	14.49	15.14	16.55	15.78	14.03	14.83	15.88	9	9.37	9.17	9.34				
10	10	10	10	10	17.53	16.1	16.82	18.25	17.44	15.28	16.67	17.84	10.06	10.72	10.11	10.33				
11	11	11	11	11	19.29	17.71	18.5	19.92	18.89	16.41	18.09	19.07	11.27	12.15	11.29	11.7				
12	12	12	12	12	21.04	19.31	20.19	21.58	20.34	17.53	19.51	20.29	12.48	13.58	12.48	13.05				
13	13	13	13	13	22.79	20.92	21.87	23.2	21.79	18.66	20.93	21.52	13.69	15.01	13.66	14.37				
14	14	14	14	14	24.28	22.13	23.29	24.81	23.25	19.79	22.35	22.75	14.72	16.08	14.66	15.6				
15	15	15	15	15	25.77	23.33	24.7	26.39	24.7	20.92	23.77	23.97	15.74	17.15	15.66	16.75				
16	16	16	16	16	27.26	24.54	26.12	27.94	26.15	22.04	25.19	25.35	16.77	18.22	16.66	17.87				
17	17	17	17	17	28.75	25.75	27.53	29.47	27.6	23.17	26.61	26.73	17.79	19.28	17.65	18.99				
18	18	18	18	18	30.24	26.95	28.95	30.99	29.05	24.3	28.03	28.11	18.82	20.41	18.65	20.08				
19	19	19	19	19	31.73	28.16	30.37	32.47	30.5	25.42	29.44	29.49	19.85	21.63	19.65	21.18				
20	20	20	20	20	33.22	29.36	31.78	33.94	31.95	26.55	30.86	30.87	20.94	22.86	20.88	22.27				

PrintSpec G7 calibration tables

Note: calibration values must be saved for iteration purposes

Verification by Physical Print Testing

Implement TVI adjustment values.
Repeat print test: *calibrated*.
Measure.

Analyzing Results

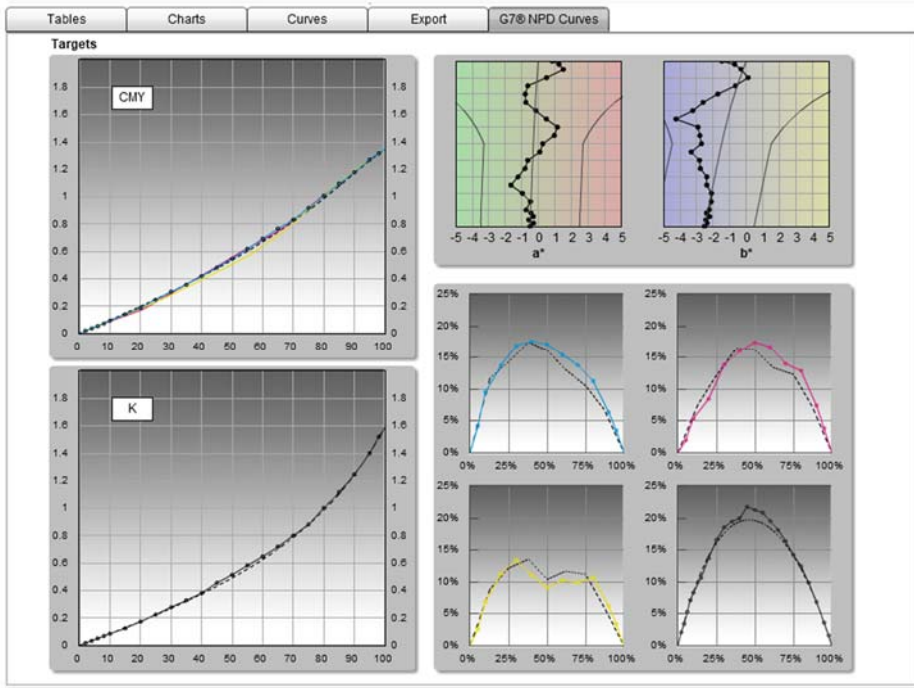
G7 calibration is reached when Peak and Average Delta L and Delta Ch are within specified tolerances (displayed green).

Greys		Peak	Average
■	CMY Delta L	3.00	2.11
■	CMY Delta Ch	3.00	1.95
■	K Delta L	3.00	2.11
		1.50	0.79
		1.50	0.95
		1.50	0.82

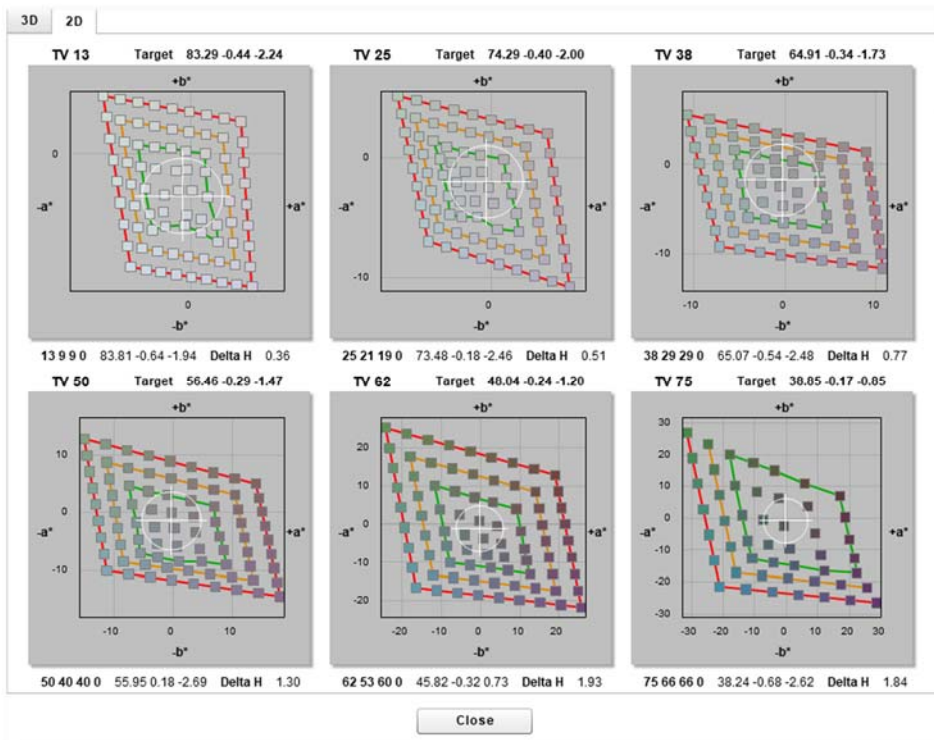
PrintSpec G7 Summary result

Note: Idealliance G7 documentation refers to Maximum (Peak) and Delta F* (Delta Ch).

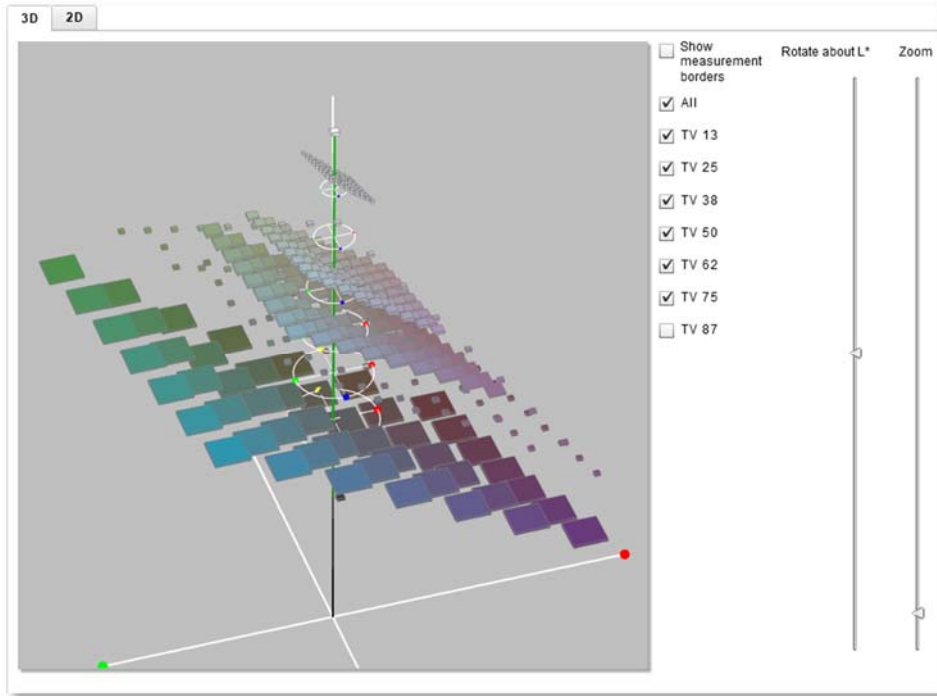
Further analysis is available through PrintSpec calibration G7 NPD curves:



PrintSpec Calibration G7 NPD curves



PrintSpec G7 2D display



PrintSpec G7 3D display (with zoom, tilt and rotate functions)

PrintSpec Tolerances

Using the 2010 G7 System Certification sample test files and the Analysis Instructions (see above) or the Idealliance Validation Process (see below), PrintSpec will achieve tolerances equal to or lower than the following.

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

Table 1: PrintSpec tolerances for 2010 sample test files

Note: Because the current G7 System Certification method uses a simulation process that eliminates print-to-print variation, and because the sample data provided by Idealliance for G7 System Certification is highly uniform, PrintSpec can produce extremely low delta errors with those specific data files. Higher errors should be expected when calibrating live printing devices, depending on the characteristics and variability of each printing system.

Idealliance Validation Process

To validate that the G7 calibration process has been successful, a target consisting of two gray scales having 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.

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 2**, 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 F* (ΔF^*) 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 ΔF^* must not exceed the Idealliance Tolerance values in **Table 2**, below.

Idealliance Tolerances

Metric	Average	Maximum
ΔF^* (CMY only)	≤ 1.5	≤ 3
ΔL^* (CMY & K)	≤ 1.5	≤ 3

Table 2: Idealliance required tolerances

Appendix A:

P2P patch values

Column 4 (K only)

C%	M%	Y%	K%
0	0	0	0
0	0	0	1.96
0	0	0	3.92
0	0	0	5.88
0	0	0	7.84
0	0	0	10.2
0	0	0	14.9
0	0	0	20
0	0	0	25.1
0	0	0	30.2
0	0	0	34.9
0	0	0	40
0	0	0	45.1
0	0	0	49.8
0	0	0	54.9
0	0	0	60
0	0	0	65.1
0	0	0	69.8
0	0	0	74.9
0	0	0	80
0	0	0	85.1
0	0	0	89.8
0	0	0	94.9
0	0	0	98.04
0	0	0	100

Table 3: CMYK percentage values in column 4 of the P2P target

P2P patch values

Column 5 (CMY only)

C%	M%	Y%	K%
0	0	0	0
1.96	1.18	1.18	0
3.92	2.77	2.77	0
5.88	4.15	4.15	0
7.84	5.61	5.61	0
10.2	7.41	7.41	0
14.9	11	11	0
20	14.9	14.9	0
25.1	18.8	18.8	0
30.2	22.91	22.91	0
34.9	26.78	26.78	0
40	30.98	30.98	0
45.1	35.48	35.48	0
49.8	39.82	39.89	0
54.9	44.71	44.71	0
60	49.8	49.8	0
65.1	54.9	54.9	0
69.8	60.16	60.16	0
74.9	66.07	66.07	0
80	71.77	71.77	0
85.1	78.06	78.06	0
89.8	84.61	84.61	0
94.9	92.2	92.2	0
98.04	96.86	96.86	0
100	100	100	0

Table 4: CMYK percentage values in column 5 of the P2P target

Appendix B:

Formulae

Converting ND to L*

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

$$\text{If: } Y > (6/29)^3$$

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

Else:

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

Calculating Delta L* (ΔL^*)

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

Calculating Delta F* (ΔF^*) – also known as Delta-ab

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