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**Idealliance.**

## G7® System Certification
## Application Data Sheet

Print Station V3.6 for Revoria Flow

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

"Print Station V3.6 for Revoria Flow" is
a production of;

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## Product

### Print Station V3.6 for Revoria Flow

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# Testing Instructions (procedures)

### Preparing the target(s)

1.  Click on the buttons "Calibration", "Target" and "Create (CMYK)" in this order.
2.  Select "G7" as calibration method.
3.  Print the P2P charts and measure with a colorimeter.
4.  The system generates a calibration target, so save it.

### Printing and Measuring the test chart(s)

1.  Click on the buttons "Calibration", "Calibration", "Create (CMYK)" in this order.
2.  Select "G7" as calibration method.
3.  Select the calibration target created in the previous step.
4.  Print the P2P charts and measure with a colorimeter.
    Note: As an alternative to this step, the colorimetric file used in the previous section on target creation can be loaded. Adjusting parameters

### Applying parameters the printing system

1.  The NPDC, gray balance curve of the printer before correction is displayed.
2.  The system generates LUTs that conform to G7 criteria.
3.  Verification will be conducted consecutively after this.

# Verification By Physical Print Testing

### Printing and Measuring "Verification" target

1.  Click the "Verify" button.
2.  The P2P chart with the LUT applied will be printed.
3.  Measure the chart with a colorimeter.

## Analyzing Results and Save Calibration File

1. The system displays the NPDC curves, gray balance curves, and ΔCh, ΔL* values for the verification chart.
2. Click the "Save" button to name and save the calibration file.

## "Print Station V3.6 for Revoria Flow" Tolerances

Using the 2010 G7 System Certification sample test files and the Analysis Instructions (see above) or the Idealliance Validation Process (see below), "Print Station V3.6 for Revoria Flow" will achieve tolerances equal to or lower than the following.

| Metric | Average | Maximum |
|---|---|---|
| ΔF* (CMY only) | ≤1.0 | ≤2 |
| ΔL* (CMY & K) | ≤1.0 | ≤2 |

*Table 1: "Print Station V3.6 for Revoria Flow" 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, "Print Station V3.6 for Revoria Flow" 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.*

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## 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*

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# 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*

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## 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*

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# Appendix B:

## Formulae

### 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*)

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

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

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

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# Appendix C:

## Verification Instructions (using VPR module)

The optional VPR module allows adjustments calculated by "Print Station V3.6 for Revoria Flow" to be tested without making a second physical print. For this a characterization target (e.g. IT8.7/4) must have been printed and measured at the same time as the P2P, ideally on the same sheet of material.

*NOTE: Results determined by the VPR process may differ slightly from results obtained by physical print testing, due to printing and measuring variations between the first and second prints, or variations between the characterization target and the P2P target.*

1.  In the same "Print Station V3.6 for Revoria Flow" session used to create the curves being verified, click ***Virtual Print Run*** to launch the VPR module.

2.  In the ***Run (curves to be applied)*** tab select the calibration run used to create the calibration curves. (Note that all variables in the ***Create Curves*** window - such as number of control points, ***Gray Balance Options***, etc., must not have changed.)

3.  In the ***Target data to be curved:*** list, select the same P2P target data file used to create the curves.

4.  In the ***Training Target (Optional):*** list, select the measurement file from the characterization target (e.g. IT8.7/4) printed at the same time as the P2P target. *(When applying VPR to a P2P target, the training target is NOT OPTIONAL).*

5.  In the ***Curving Method*** area, select ***Curve Lab values (retains CMYK values and target type)***.

6.  Set the ***Precise / Smooth*** slider to ***Precise***.

7.  Click ***Curve & Export…*** and save the VPR-adjusted P2P data.

8.  Click the + (Plus symbol) at the bottom of the ***Calibration Runs*** list to create a new run (called by default ***Run 2 – Verification***).

9.  Either drag the VPR-adjusted P2P data into the ***Measurements*** list, or click on the + (Plus symbol) below the list and browse for the file.

10. Select the ***Analyze*** tab and then select the ***G7*** sub-tab.

11. In the ***Analyze – G7*** window the ***Results*** table shows the average and maximum Delta L* ($\Delta$L*) values for the K-only and CMY gray scales (P2P columns 4 and 5). Also shown are the Delta F* ($\Delta$F*) (also known as Delta-ab ($\Delta$ab)) for the CMY gray scale (P2P column 5). These values can be compared to the $\Delta$L* and $\Delta$F* tolerances shown in the chart in ***Analyzing Results***.

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