



Off-Press Proof Application Data Sheet

HP Indigo 7000 Digital Press / HP Indigo Press 5500/5000, GPA, Ultra Digital 100# Gloss Text 150 GSM GMGColorServer Plus Certification category - GRACoLCoated #1

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

Hewlett-Packard Company

Indigo Division

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Certified on August 5, 2009

II. Product

1. Press: HP Indigo 7000 Digital Press / HP Indigo Press 5500/5000
2. Press RIP: Global Graphics Harlequin 7.2 r7
3. Proofing Software: GMG ColorServer Plus
4. Substrate: GPA, Ultra Digital 100# Gloss Text 150 GSM
5. Certification Category: GRACoL Coated #1

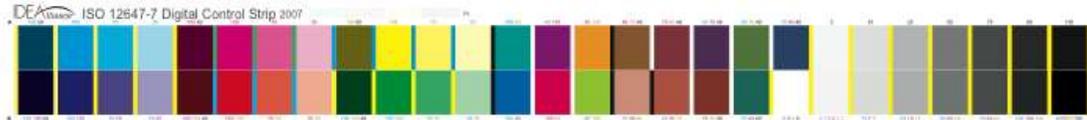
III. Introduction

The HP Indigo Digital press utilizes liquid electro photography (LEP) to create offset and photo quality prints. Its high accuracy, consistency, and uniformity make it well suited for both proofing and production. The GMGColorServer Plus transformation process creates a color conversion table which enables the HP Indigo Digital Press to reach the desired accuracy that is needed for GRACoL proofing level.



IV. Control Guide

IDEAlliance specifies a control guide, such as an IDEAlliance ISO 12647-7 Digital Control Strip 2007, be supplied on every off-press proof. As a minimum, any control 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 a 25%, 50%, and 75% tint 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

1. Press: HP Indigo 7000 Digital Press / HP Indigo Press 5500/5000
2. Press RIP: Global Graphics Harlequin 7.2r7
3. Proofing Software: GMGColorServer Plus
4. GMG ColorServer Plus HP Indigo GRACoLStarterkit
5. Substrate: GPA, Ultra Digital 100# Gloss Text 150GSM
6. X-Rite Eye-one iSis (UV-Included)

VI. Step by Step Procedure

This tutorial will explain step by step how to set up an HP Indigo with a GMG ColorServer Plus device link profile for a GRACoL Coated #1 certified proofing system.

The GMG device link technology requires the following elements:

- GMG gamut file (.csc)
The gamut file is a description of the non color managed output device. An industry standard testchart can be used to create a gamut file (e.g. the ECI2002 test chart)
- GMG device link profiles (.mx4)
Based on the gamut file and the provided target values (in this case GRACoL) a GMG device link profile can be created/iterated to achieve the best possible match to the desired target color space
- Exported ICC device link profile
Based on the mx4 profile, an ICC device link profile can be exported for implementation directly in the HP Indigo front-end
- On the press DFE import the ICC device link profile. Admin/ICC profiles/ import/CMYK, browse to GMG profile.
- Inside the created ticket template/color management tab. Drop down the list of available ICC profiles. Select the correct ICC profile. Select rendering intent to relative.
- Process your files using this ticket template.

Preparation

The machine needs to be in optimal condition and a full color calibration on the HP Indigo Press has to be completed (see “*HP Indigo – User Guide*”).

Create a ticket template with color management turned off. “*HP SmartStream Production Pro Print Server - User Guide*”

Line thinning should be turned on. “*HP SmartStream Production Pro Print Server - User Guide*”

More information can be found at “*HP SmartStream Production Pro Print Server - User Guide*”



Gamut creation

NOTE: If the machine was previously color-managed with GMG and the device did not change dramatically then an old gamut can be used for the mx4 creation and therefore the steps for gamut creation can be skipped.

Print test form

To create a GMG gamut file, print the “GMG ColorServer Plus test suite.pdf” file which can be found in the “GMG GRACoL HP Indigo Starterkit”. Make sure that all color management is turned off (see preparations).

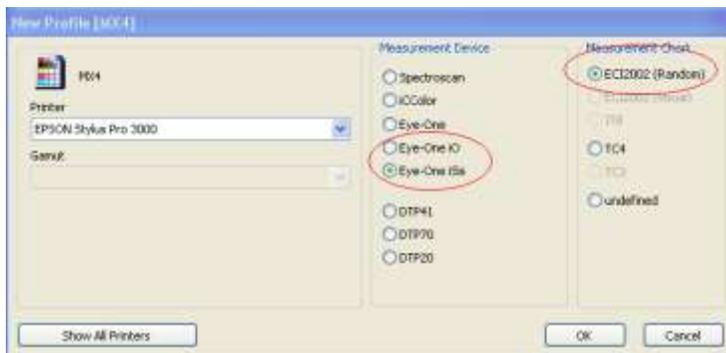
It is recommended to print 5 copies to ensure that the machine is warmed up and averaging over multiple charts can be done.

Measuring and averaging the gamut

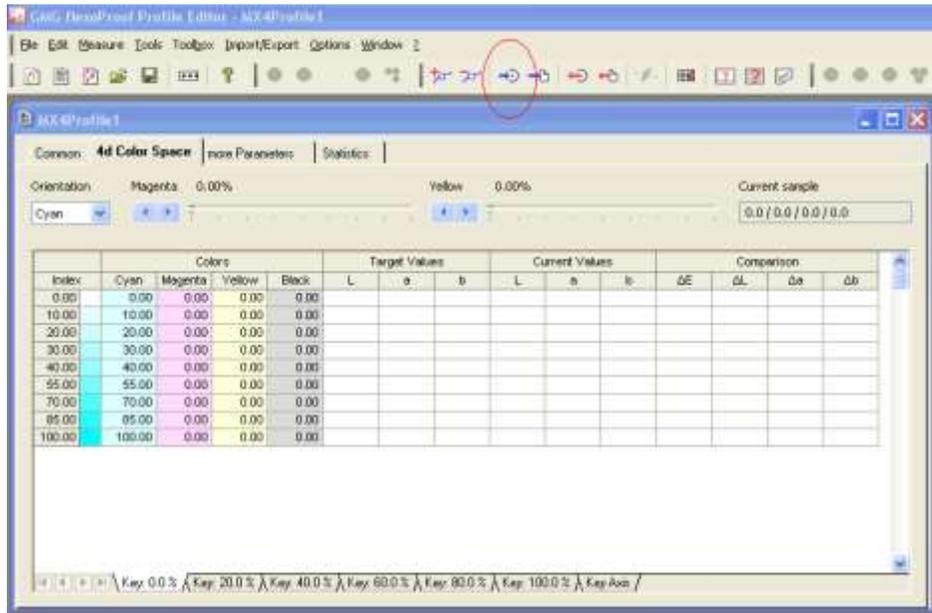
Measurement

GMG recommends to disregard the first 3 prints and average print 4 and 5 (or more) to ensure optimal results. The ColorServer Plus test suite contains 3 pages. Page 1 contains images for visual comparison. Page 2 and 3 contain the ECI 2002 chart for the iSis and the iO-table measurement device. Depending on what measurement device is available, either page 2 or 3 can be disregarded.

Open GMG ProfileEditor and create a new mx4 file. This will be used as the measurement template. Ignore the printer and gamut drop down menus but select the correct measurement device (iSis or Eye-One iO) and the correct test chart layout (ECI2002(Random)).

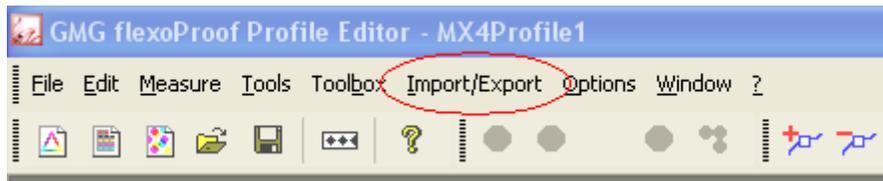


To measure the first test chart, press the “measure target values” button.



A measurement window will open with the appropriate measurement device and measurement template already selected. Follow the instruction on the screen to complete the measurement.

Once the target values are measured, export them as a .txt file.
Import/Export -> Export target values -> Text File

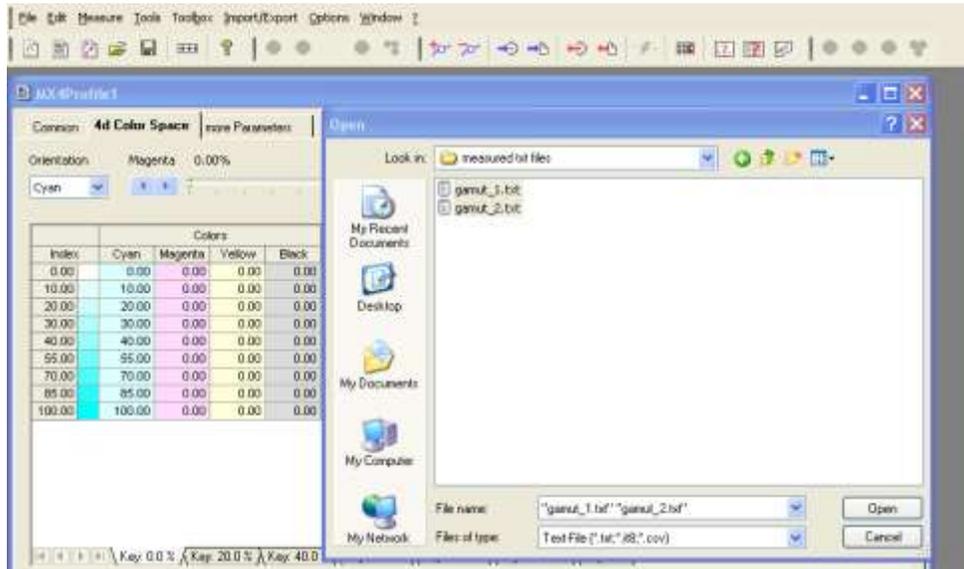


Close the mx4 without saving and repeat the above steps for every sheet that should be measured and later averaged (recommended at least 2).

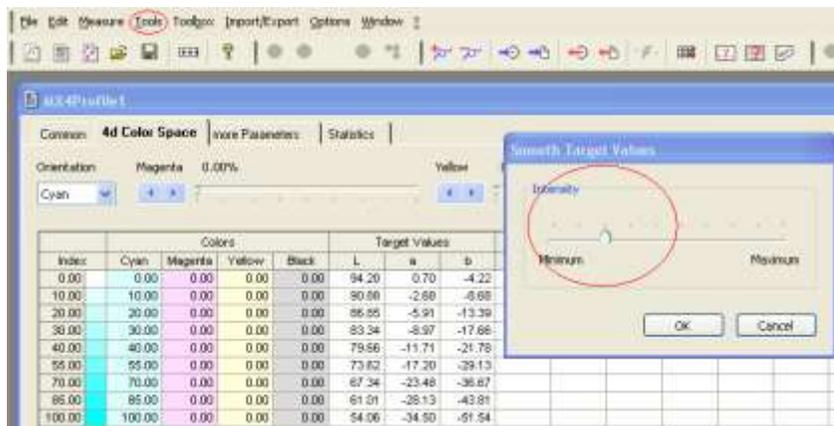
Average and smoothing

To average and smooth the measured gamut data, a new mx4 needs to be created again. Ignore the printer and gamut drop down menus but select the correct measurement device (iSis or Eye-One iO) and the correct test chart layout (ECI2002(Random)).

Import all measurement files that are supposed to be averaged. To do so, go to Import/Export -> Import Target Values and select all txt files which should be averaged. The GMG ProfileEditor will import and average all selected txt files automatically.



To do further optimization of the measurement data, an optional smoothing can be done. Tools -> Smooth Target Values



Export of gamut file

Once the target values are imported and smoothed (optional), they can be exported as a gamut file. To do so, please go to Import/Export -> Export Target Values -> Gamut File...

It is essential that this file is saved at ColorProof/Printers/ColorServer. The following naming format is recommended:

Date_machinename_papername_measurementdevice.csc



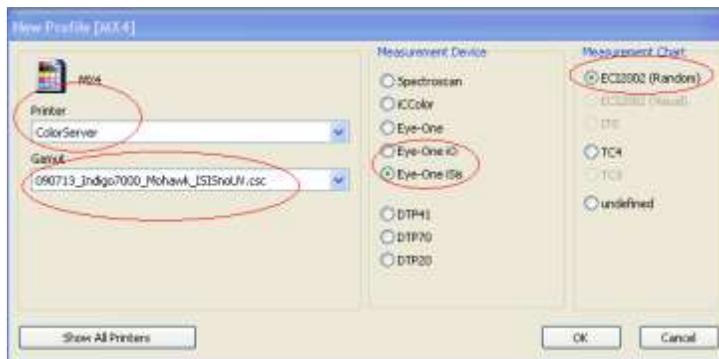
Creation and export of device link profile

Creation of mx4

Create a new mx4 profile, this time selecting the printer as “ColorServer”, and the gamut file, that was previously created for the HP Indigo/substrate combination.

NOTE: If the machine was previously color-managed with GMG and the device did not change dramatically, an old gamut can be used for the mx4 creation and therefore the above steps for gamut creation can be skipped.

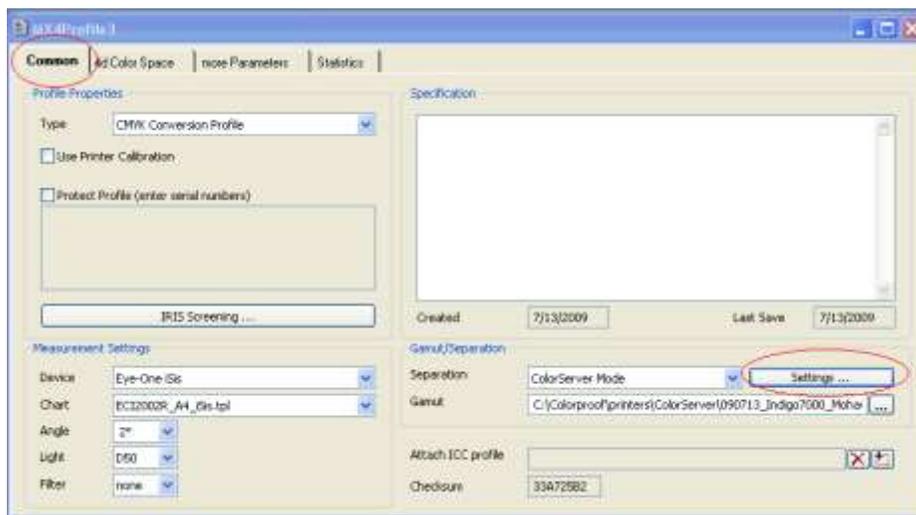
Make sure you select the correct measurement device (iSis or Eye-One iO) and the correct test chart layout (ECI2002(Random)).



Since we want to create a match to GRACoL, the appropriate GRACoL target values have to be imported. The GRACoL target values for the ECI2002 chart can be found in the “GMG GRACoL HP Indigo Starterkit”.

Go to Import/Export -> Import Target Values and browse to the “GRACoL2006_#1_commercial_ECI2002_target_values.txt” file.

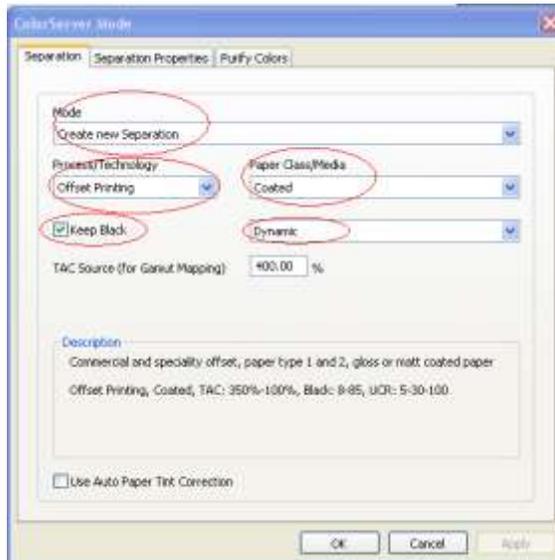
After the target values are imported, the separation settings need to be adjusted. To do so, go to the common tab and click the “settings” button next to the color server mode.



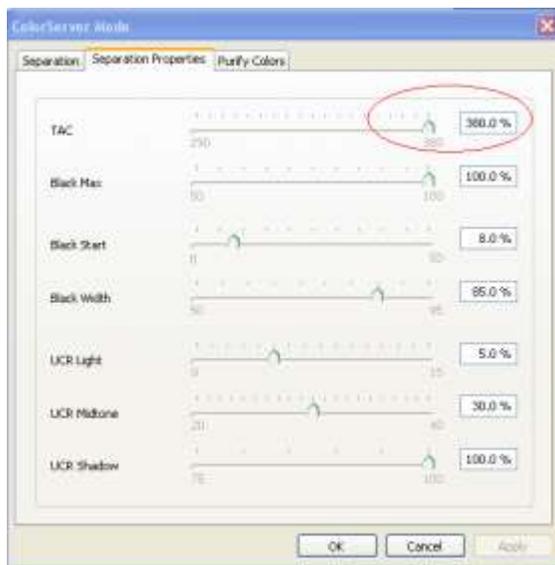
It is recommended to select “Create new Separation” and the below settings.



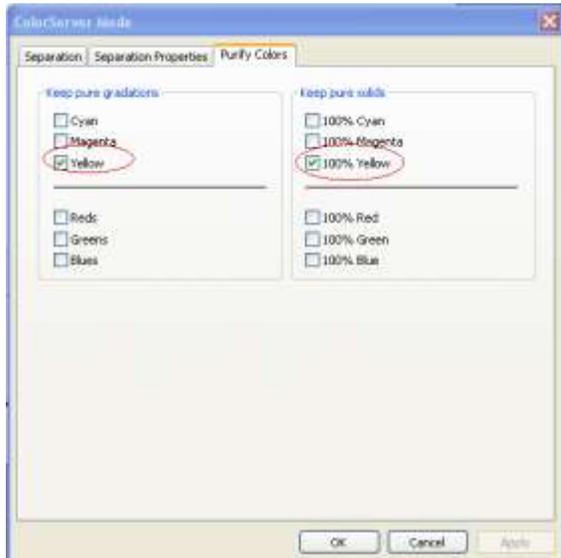
NOTE: The below settings will not create any paper tint simulation, therefore a GRACoL compliant substrate needs to be loaded.



Additionally, the TAC should be adjusted to 380% in the “Separation Properties” tab.



It is recommended that yellow is kept pure to keep the yellow gradient as clean as possible. A gradation will be applied to yellow but further color management will be ignored.



Once the above settings are applied with “ok”, the first device link profile can be calculated. To do so, please select the “calculate with target values” button.



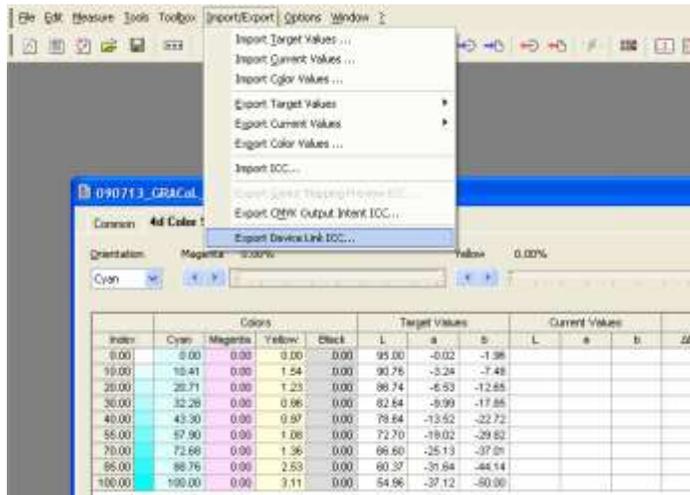
The mx4 is now calculated for the first time. After the calculation is completed, it is recommended to save the mx4 profile with the following naming structure:

Date_GRACoL_machinename_papername_measurementdevice_01.mx4

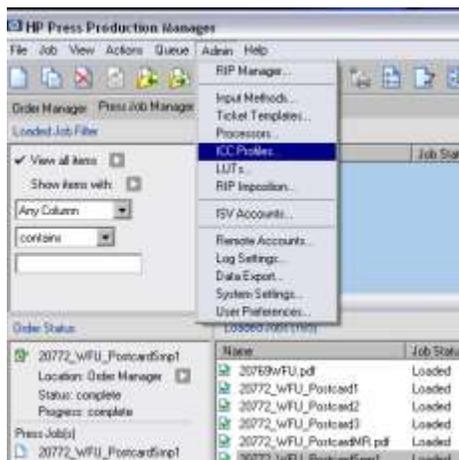
Export of device link ICC profile

Within the GMG ColorServer Plus application, a hotfolder system can be created and files can be processed on the GMG computer. For further information on this topic, please consult the GMG ColorServer manual. For the use with the HP Indigo, it is recommended to utilize the “export device link ICC” option and import the ICC profile in the HP Indigo press manager. This way the optimum performance can be achieved.

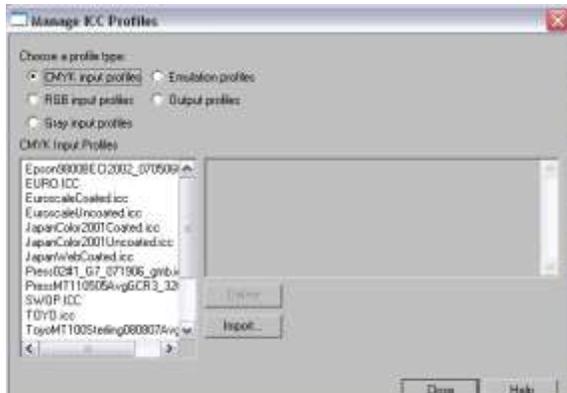
To export the GMG mx4 and ICC device link profile, go to Import/Export -> Export Device Link ICC...



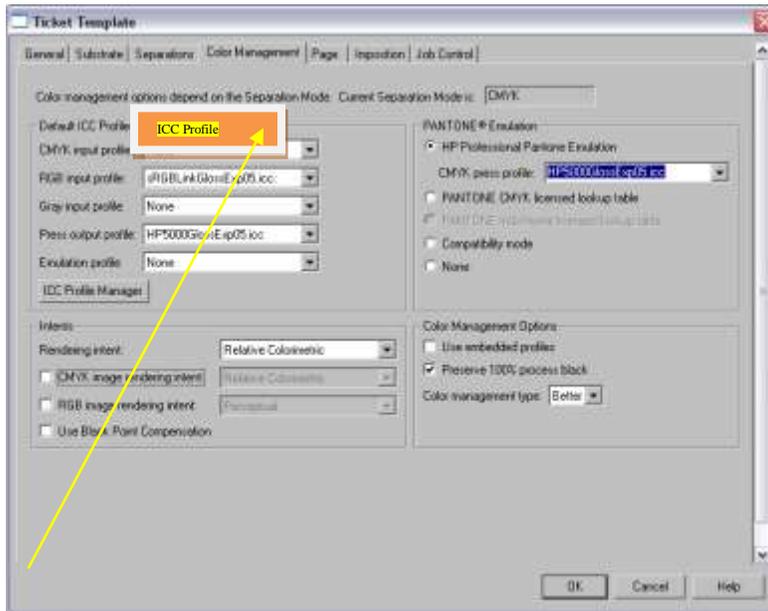
It is recommended to save the ICC profile with the following naming convention:
Date_GRACoL_machinename_papername_measurementdevice_01.icc
To apply this ICC profile to the workflow, it needs to be loaded at the HP Indigo press manager.



Import the exported GMG Device Link profile using the HP Indigo Press manager.
Admin/ICC profiles.



Select the type of profile exported from GMG ColorServer, CMYK input profile.



Select from the CMYK input profile drop down list your new profile. Process your job using HotfolderGRACoLor folder that the tickettemplate profile was assigned to. Refer to the HP indigo user guide for instructions on how to deploy Input methods and ticket template assignment. [Admin/Ticket Template/Color Management Tab.](#)

Iterations

To ensure best possible color match, the GMG ColorServer Plus supports iterations. This means that the current quality of the profile can be measured and evaluated in the software and it will adjust itself and a new version of the profile can be created.

To do an iteration, the current status of the proofing profile needs to be measured. It is recommended that the “GMG ColorServer Plus test suite.pdf” file which can be found in the “GMG GRACoL HP Indigo Starterkit” is used for iteration. Make sure that the correct ICC device link profile is loaded when the test suite is printed.



It is recommended to print 5 copies to ensure that the machine is warmed up.

To start the iteration, open the mx4 which was used to either process the file or to export the device link ICC profile which was used.

Measure the current values on the printed sheets. To do so, press the “Measure Current Values” Button



A measurement dialogue will open with the correct measurement device and measurement template selected.

After all current values are measured it is recommended to save the profile.



Once saved, the statistic tab can be controlled if satisfying results were achieved. If the results are not to satisfaction, then a new iteration of this color profile can be created. To do so, click the “Calculate with current values” button.



The profile will be updated and has to be saved as a new iteration/profile. It is recommended to follow the following naming convention:

Date_GRACoL_machinename_papername_measurementdevice_<iteration count>.mx4

And for the ICC export:

Date_GRACoL_machinename_papername_measurementdevice_<iteration count>.icc

This new ICC profile can be imported in the HP Indigo press manager and used for production or additional iterations can be done.

NOTE: Even though you can do an unlimited amount of iterations in the GMG software it is not recommended to do more than 5 iterations and usually 2-3 iterations will provide excellent results.

If you choose to do additional iterations, just repeat the above steps until satisfying results are achieved.

VII. Finished Proof Characteristics

A proof with the color characteristics referenced in Appendix 1 is to be expected when measured from the IDEAlliance 12647-7 Color Control Strip, having been properly made to all the listed system components and finishing procedures. The measurement device used to compare CIE Lab data was X-Rite Eye-one iSis (UV-Included).



VIII. Sample Proofs

HP Indigo Division has supplied three (3) sets of hard copy proofs for retention that conform to this Application Data Sheet by an IDEAlliance certifying contractor.



**Appendix 1
Characterization Data CIELab Values**

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

Patch ID Top	CIELab Data			Maximum
	L*	a*	b*	CIE ΔLab
A1	30.05	-22.65	-28.82	-
A2	54.96	-37.12	-50.00	5
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	5
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	5
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	-
A27	14.95	0.19	-0.14	5

Patch ID Bottom	CIELab Data			Maximum
	L*	a*	b*	CIE ΔLab
B1	15.18	8.84	-24.61	-
B2	24.13	17.20	-46.14	6
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	6
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	6
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	-
B27	8.46	0.34	0.44	-

Note: Color measurements comparing measured proof data to this reference data requires the use of a calibrated spectrophotometer.