Extended-Gamut Printing

Pointers for Brand Owners and Printers

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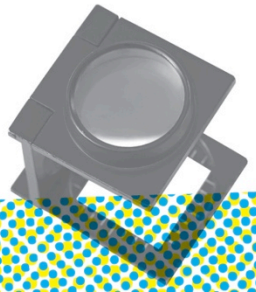
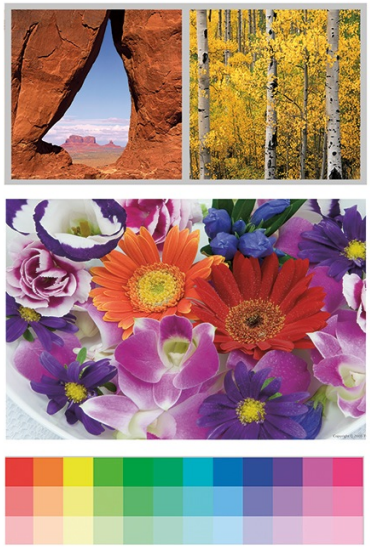
Advancing Graphic Communications

PRINTING INDUSTRIES OF AMERICA



What is Extended Gamut?

Larger than “normal” press CMYK: cleaner, purer colors!



What is an extended-gamut printing system?

- “Enhanced” CMYK printing with *high-chroma* inks, and/or …
- CMYK Printing with additional colors: typically orange or red, green, and blue or violet
- Defined by Context: relative to “normal” for type of printing, not absolute gamut

What sort of presses?

- Offset
- Flexographic
- Gravure
- Digital toner or inkjet

What does this mean for *packaging?*

Economy:

- Spot colors can be simulated with a fixed set of 5, 6, or 7 inks
- Less ink mixing, inventory, and waste
- Elimination of most press wash-ups and changeovers
- Fewer plates to be made
- Simpler press planning and scheduling—easy to combo jobs

Stability and Accuracy:

- Extra process colors even out effects of density fluctuations
- More accurate proofs
- Colorful RGB images can be rendered more faithfully

Extended-Gamut: Disadvantages

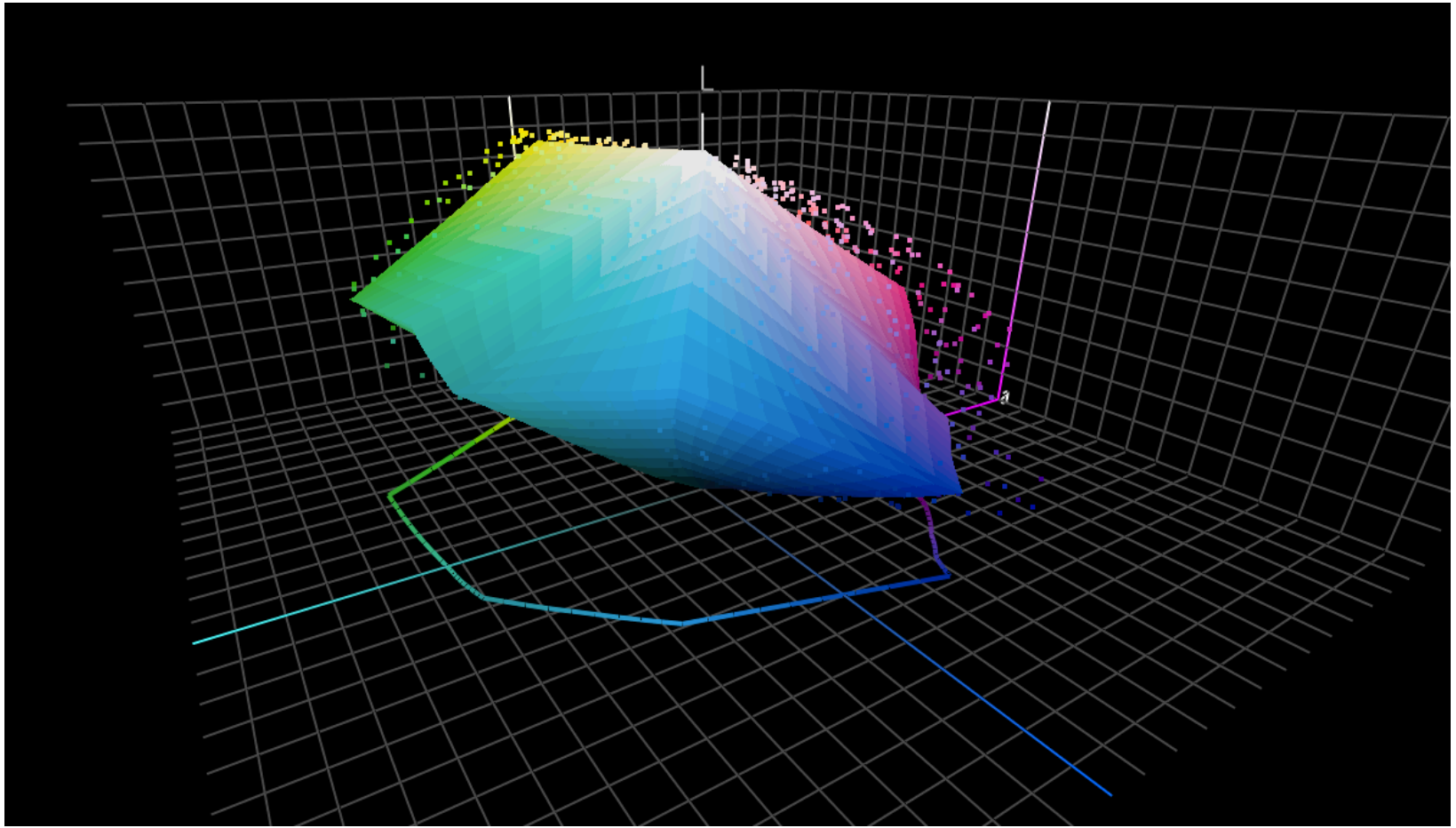
- Cannot match all spot colors
- Requires new procedures and skills
- Requires specialized software
- Requires expert implementation
- Isn’t widely understood and accepted

Assumptions for EG Package Printing:

Customer approval by the numbers

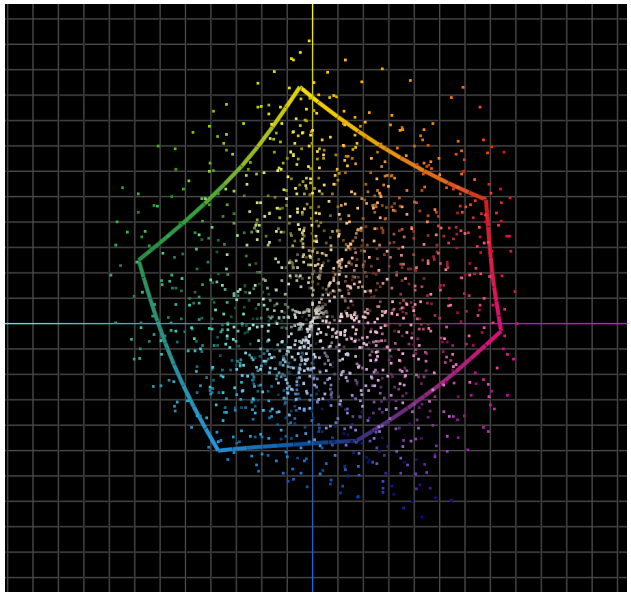
Existing designs and design practices will continue: CMYK and spot colors

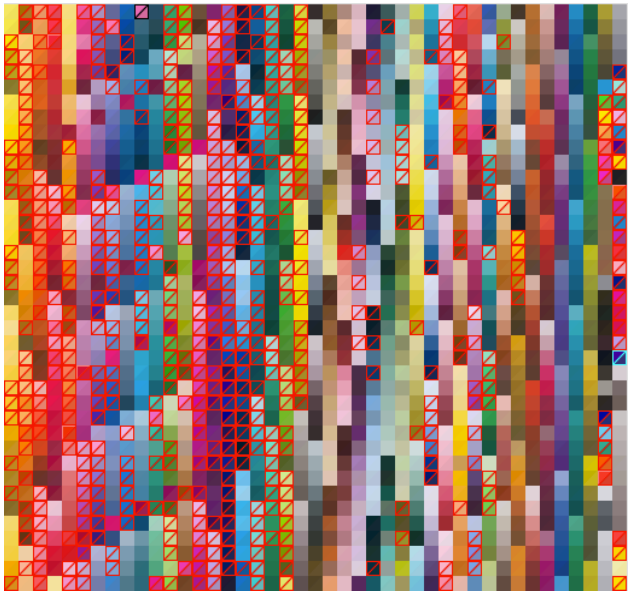
Legacy work will be converted



How many spot colors can be printed—
What is the range?

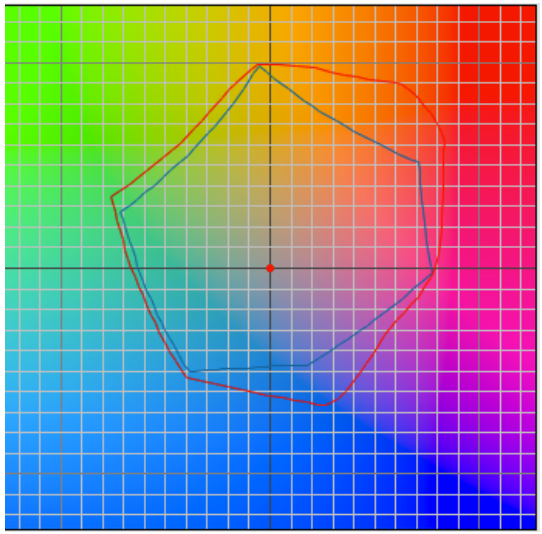
Pantone Coated + v2 v GRACoL2006/Fogra 39 CMYK

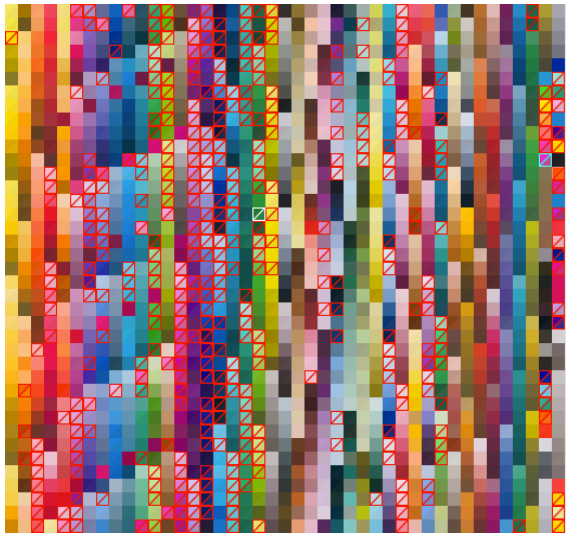




How many spot colors can be printed—
What is the range?

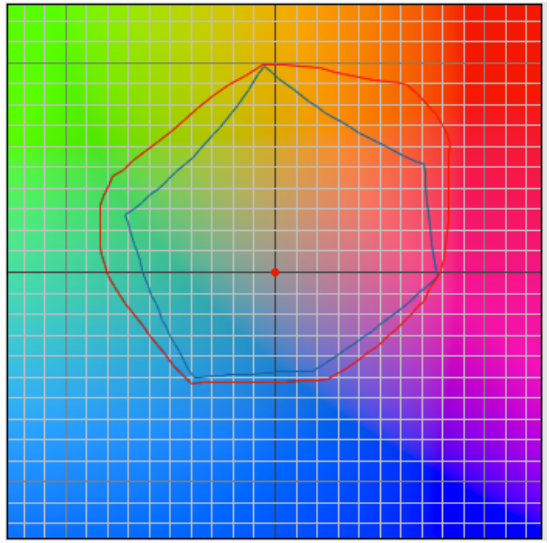
CMYKOV

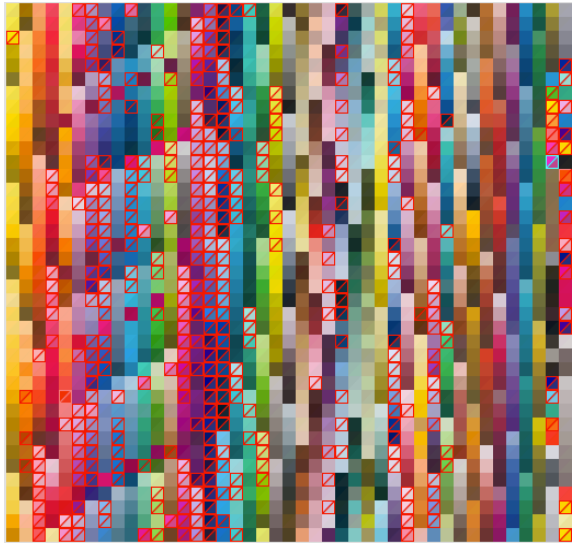




How many spot colors can be printed—
What is the range?

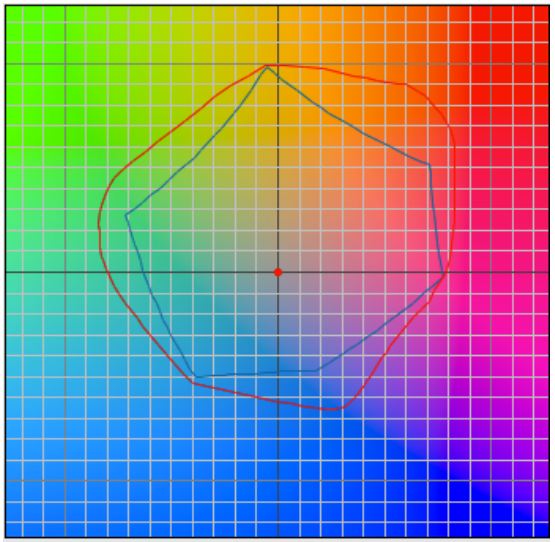
CMYKOG

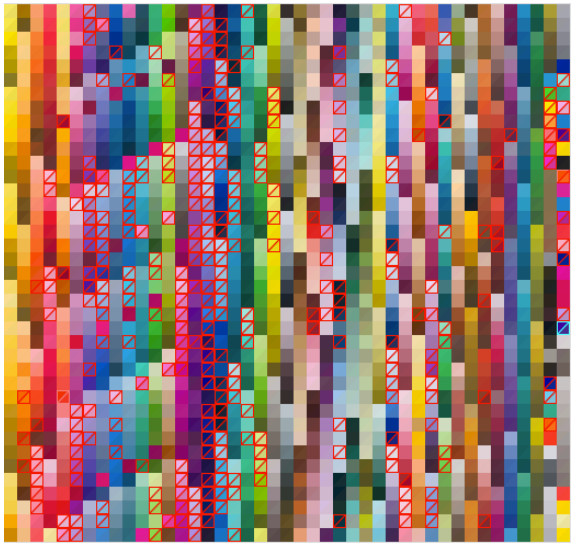




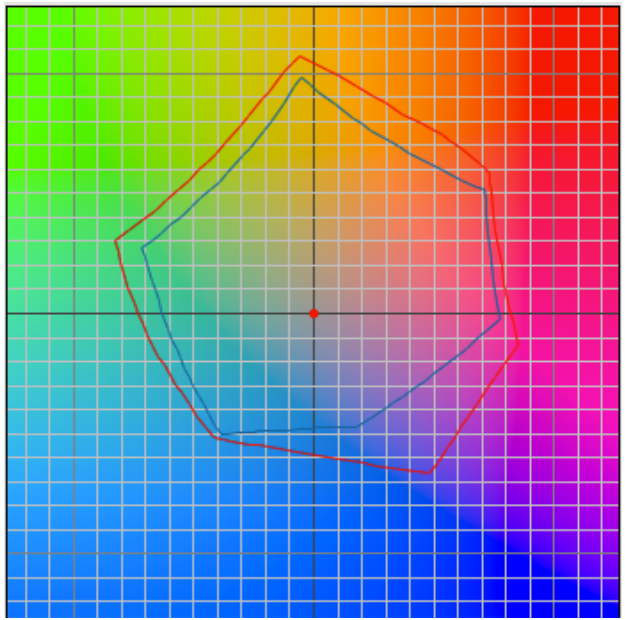
How many spot colors can be printed—
What is the range?

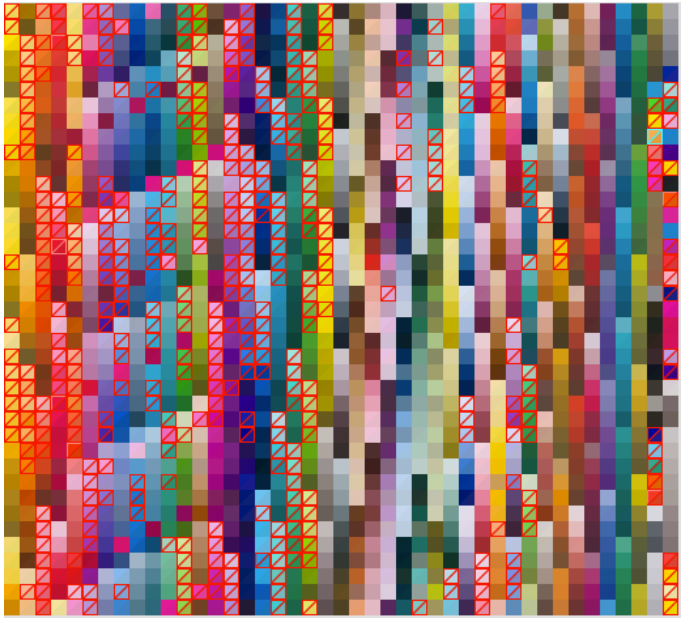
CMYKOGV

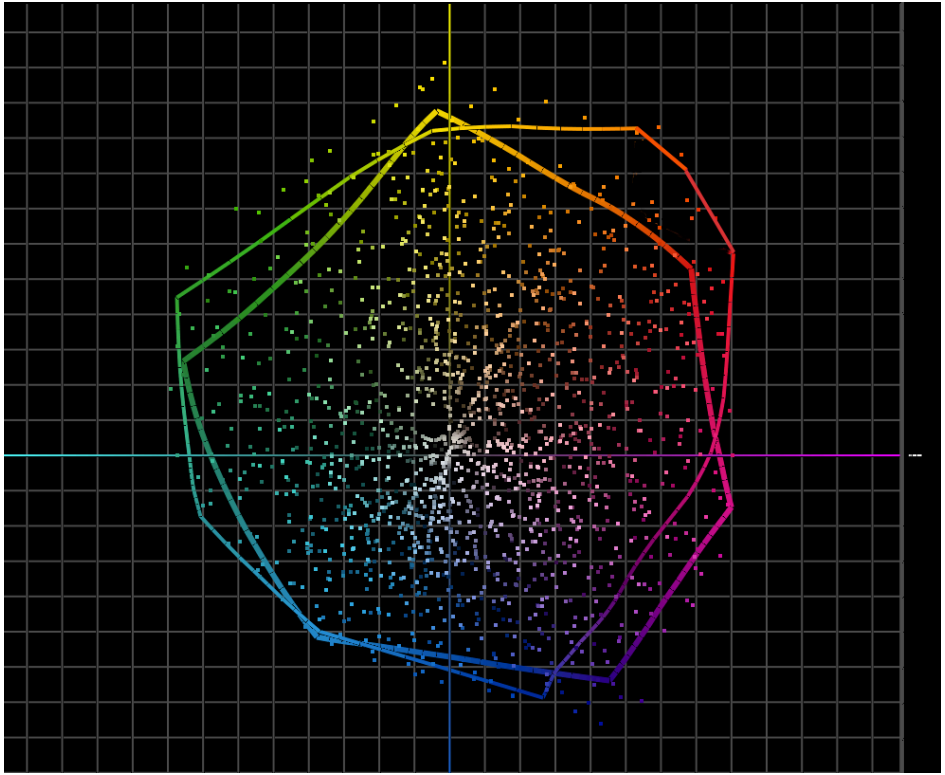


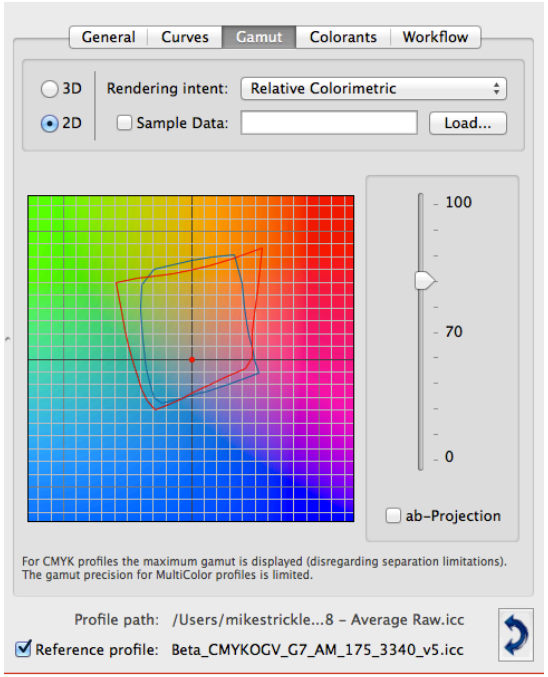


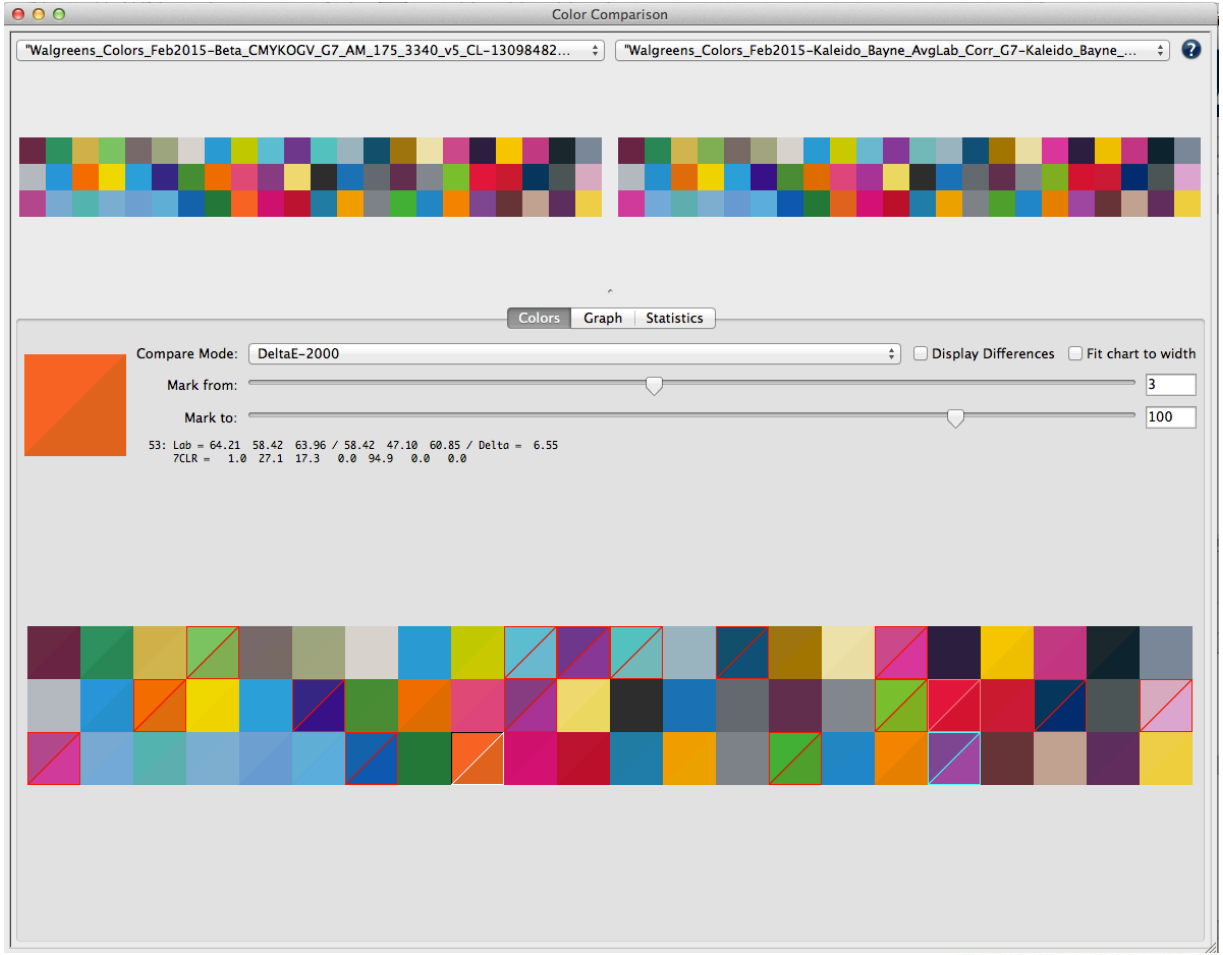
What About Extended CMYK?



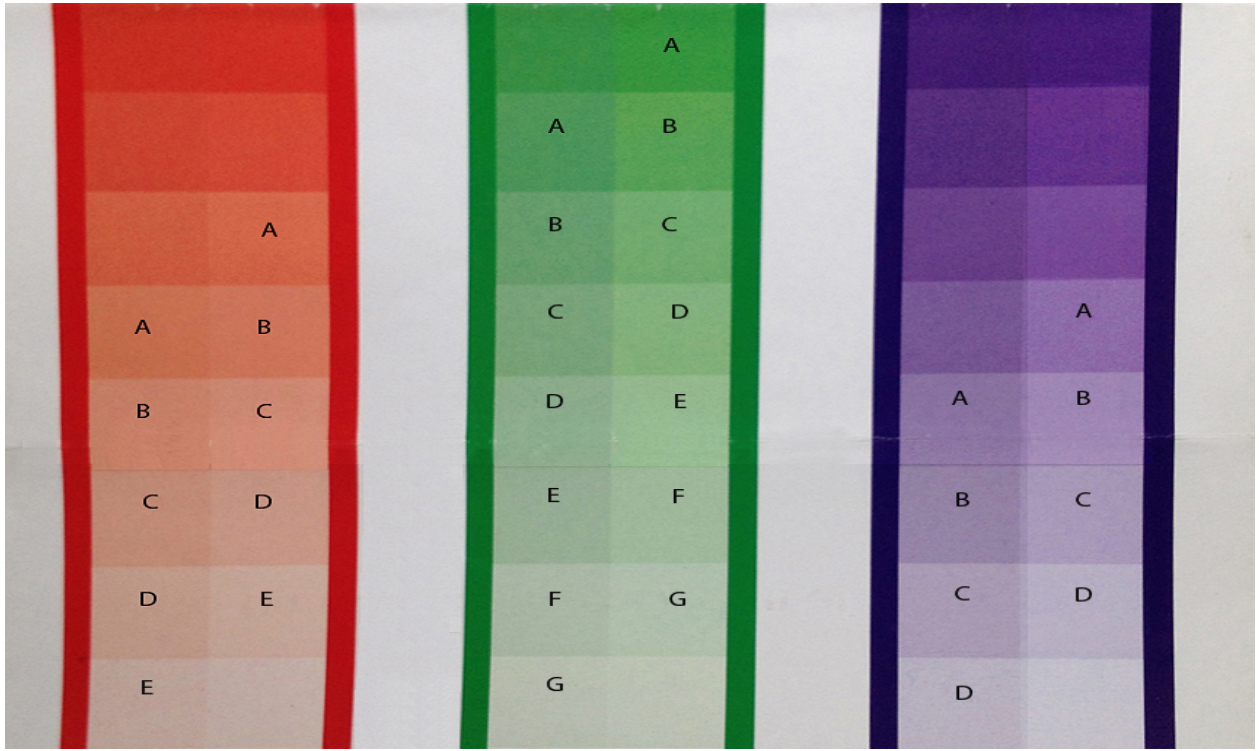





General
Curves
Gamut
Colorants
Workflow
3D
2D
Rendering intent:
Relative Colorimetric
Sample Data:
Load...
100
70
0
ab-Projection
For CMYK profiles the maximum gamut is displayed (disregarding separation limitations).
The gamut precision for MultiColor profiles is limited.
Profile path: /Users/mikestrickle...8 - Average Raw.icc
Reference profile: Beta_CMYKOGV_G7_AM_175_3340_v5.icc


Color Comparison
"Walgreens_Colors_Feb2015-Beta_CMYKOGV_G7_AM_175_3340_v5_CL-13098482...
"Walgreens_Colors_Feb2015-Kaleido_Bayne_AvgLab_Corr_G7-Kaleido_Bayne_...
Colors
Graph
Statistics
Compare Mode:
DeltaE-2000
Display Differences
Fit chart to width
Mark from:
3
Mark to:
100
53: Lab = 64.21 58.42 63.96 / 58.42 47.10 60.85 / Delta = 6.55
7CLR = 1.0 27.1 17.3 0.0 94.9 0.0 0.0

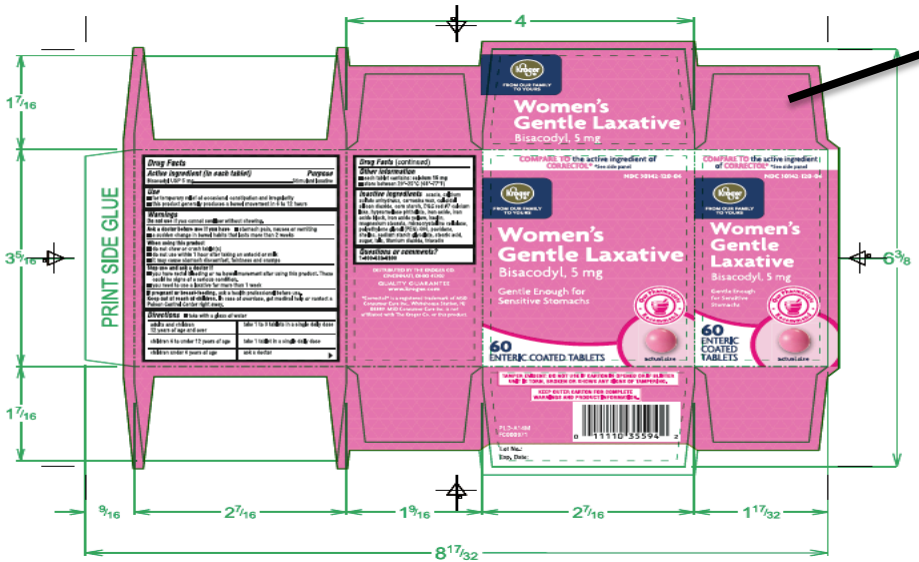
Screening and Gamut: The FM Advantage



How are EG Jobs Prepared?

- **Old way**: Lookup table and manual file rebuilding:

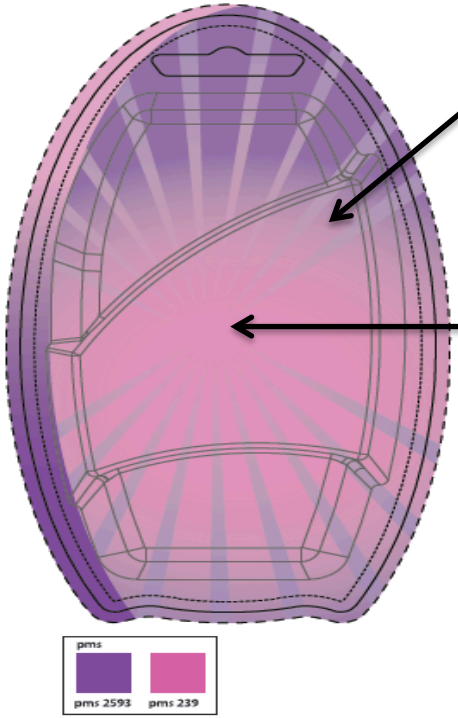
Input: Spot color



QName	YEL	MAG	CYAN	BLACK	WM	REDREFLEX	GREEN	RHOD	
Q210*	0	0	0	0	7	0	0	27	
Q211*	0	0	0	0	14	0	0	38	NOT APP
Q212	0	70	0	0	15	0	0	0	
Q213	0	90	0	0	15	0	0	0	
Q214	0	100	0	5	30	0	0	0	
Q215	0	100	0	25	20	0	0	0	
Q216	0	100	0	48	20	0	0	0	
Q217	0	0	0	0	0	0	0	25	
Q218	0	58	0	0	0	0	0	0	
Q219	0	90	0	0	0	0	0	0	
QRUBINE	0	100	0	5	35	0	0	0	
Q220	0	100	0	25	40	0	0	0	

Output: N-color build

Example: Spot Vignettes and Overprints



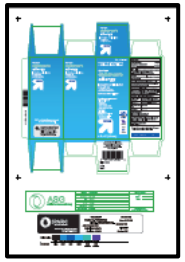
35% Pantone 239 C + 32% Pantone 2593 C

= ? C ? M ? Y ? K ? O ? G ? V

60% Pantone 239 C = ? C ? M ? Y ? K ? O ? G ? V

How are EG Jobs Prepared?

New way: conversion in color server:

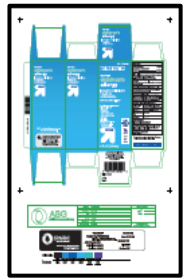


CMYK (from source profile) → Device link → N-color output

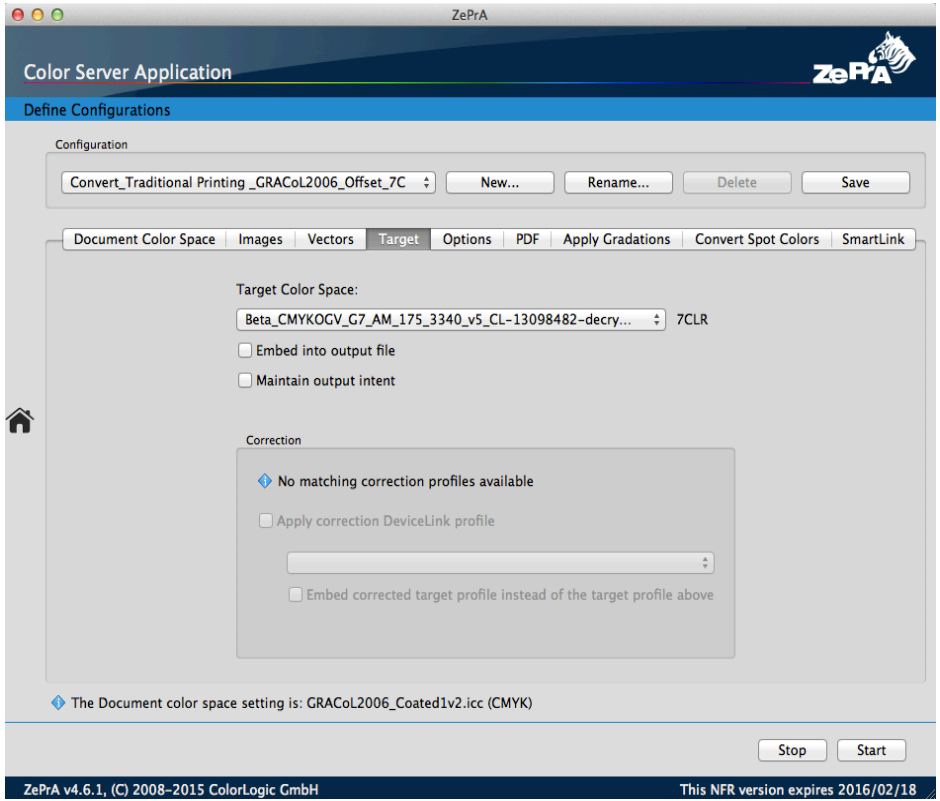
Spot solids (Lab, Spectral) → N-color profile (+channel restrictions) → N-color output

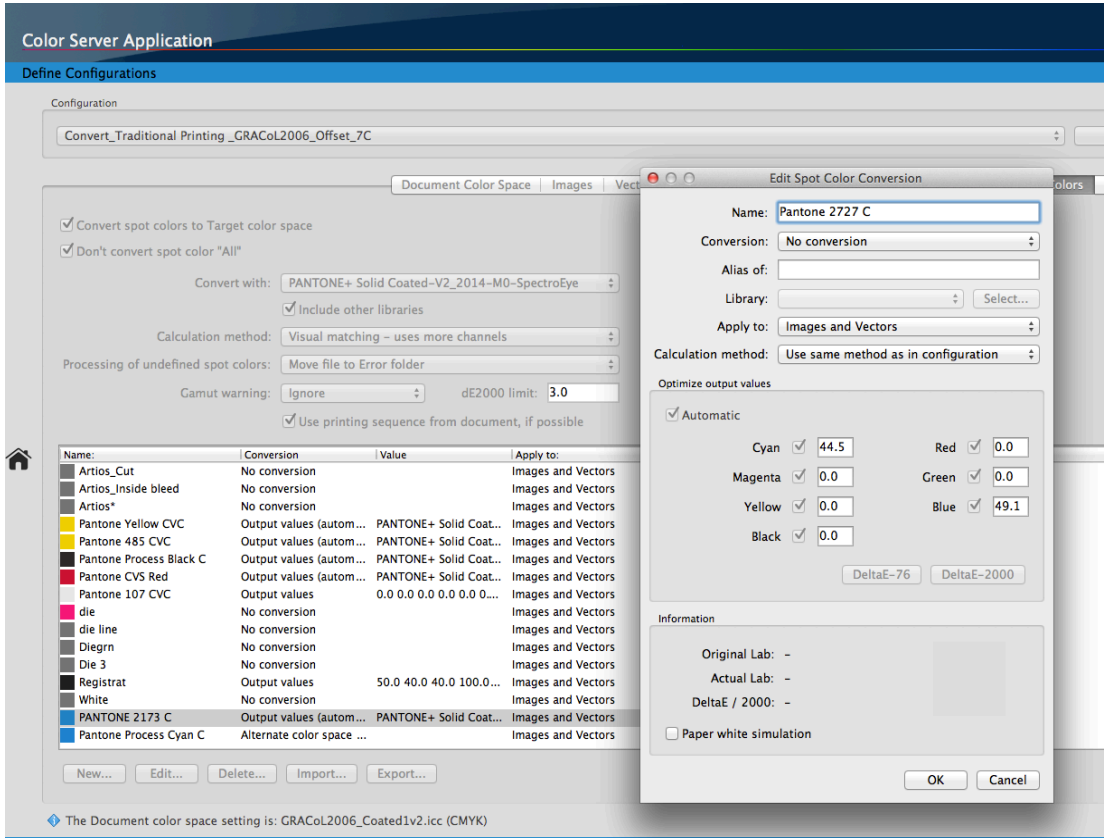
Spot tints (from measured values or assumed TVI) → Spectral blending

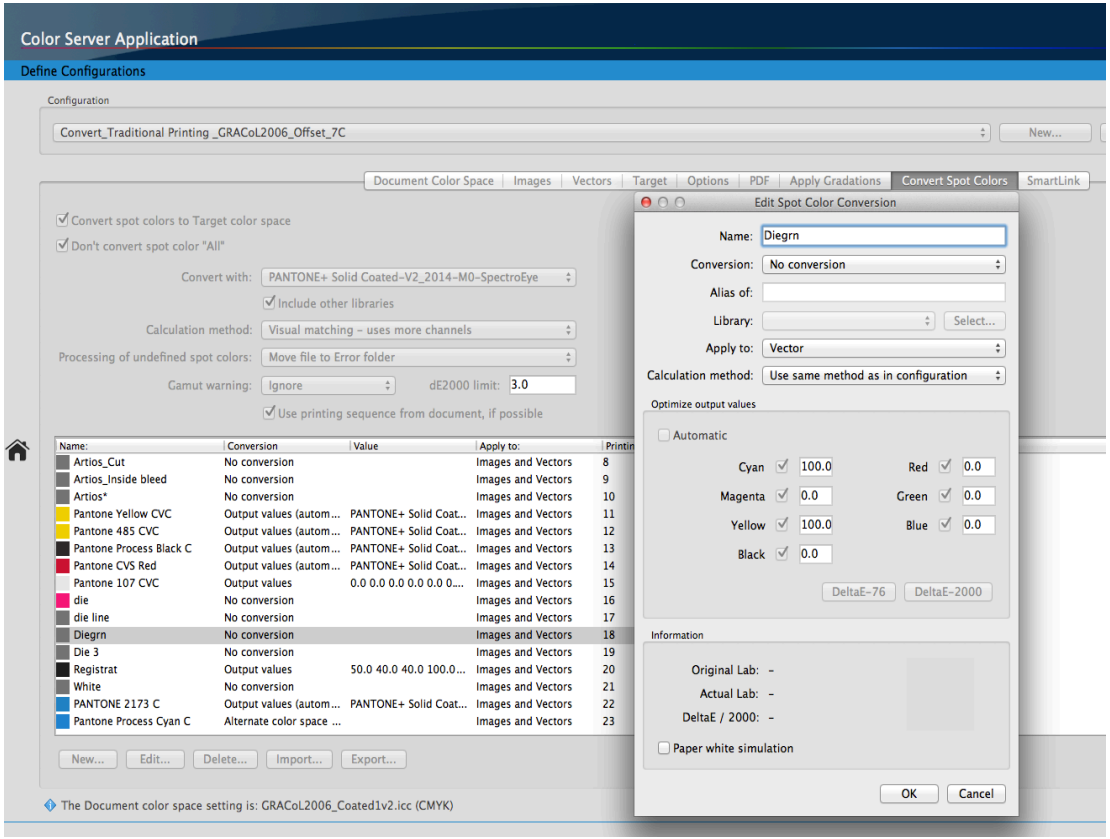
Spot-spot and spot-CMYK overprints → Spectral blending

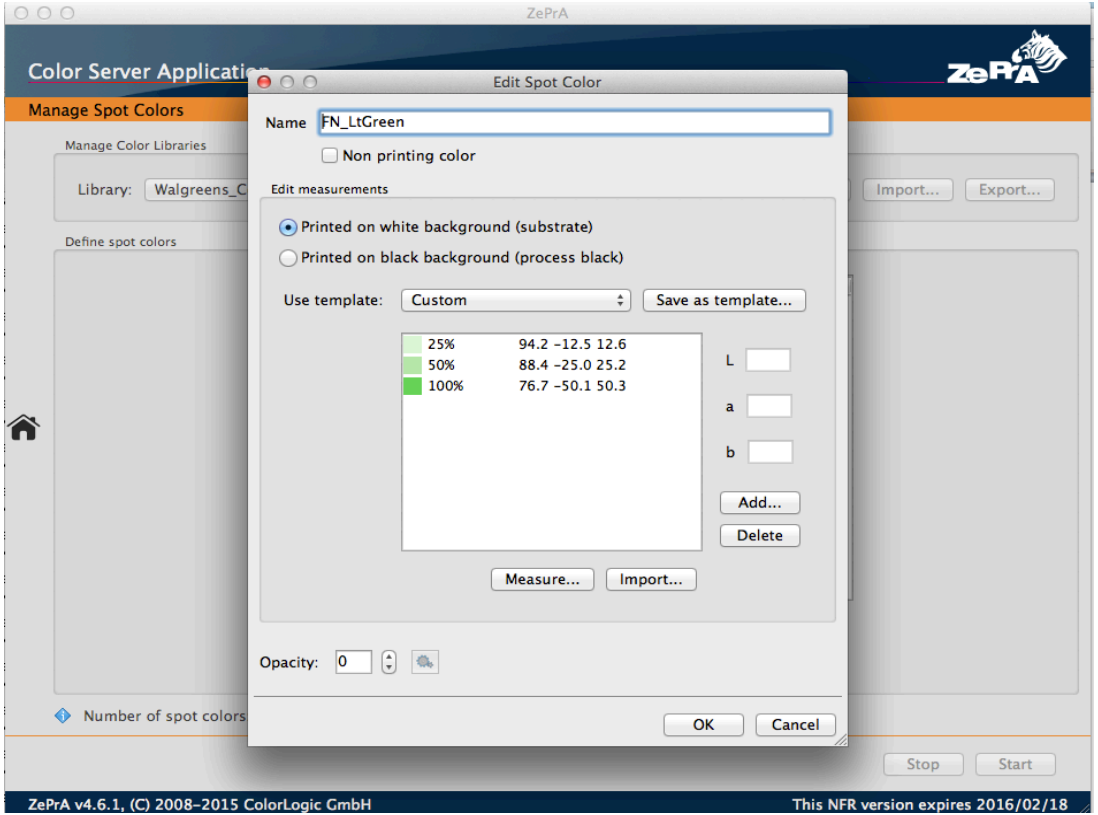


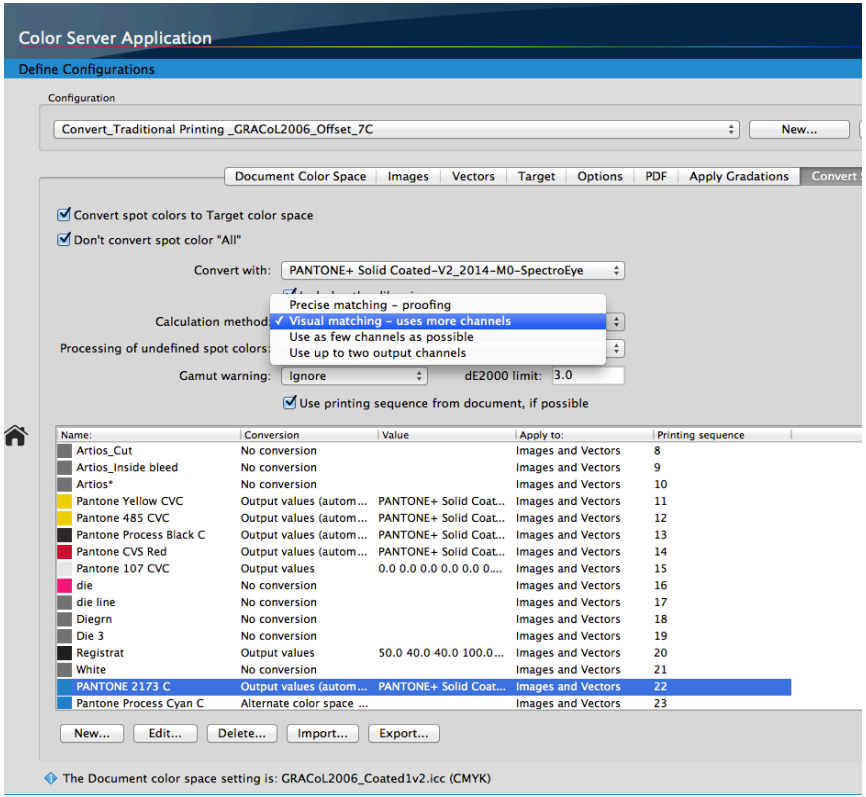
Color Server Functions



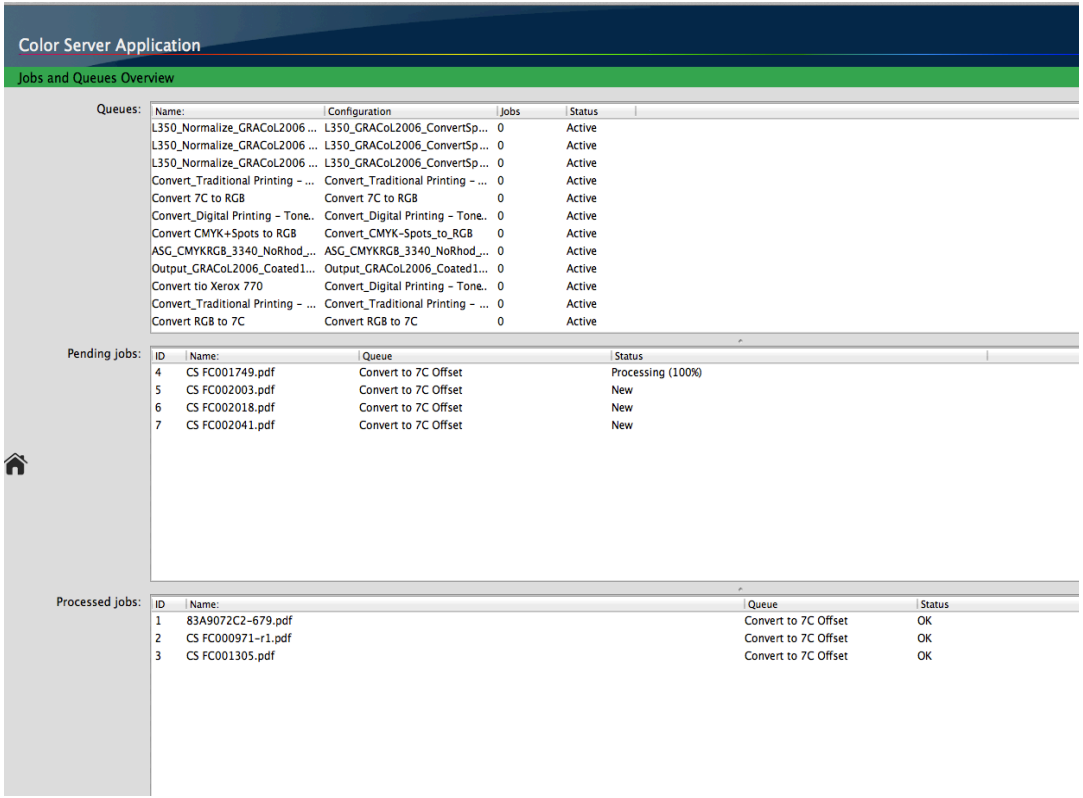

Color Server Application
Define Configurations
Configuration
Convert_Traditional Printing _GRACoL2006_Offset_7C
Document Color Space
Images
Convert spot colors to Target color space
Don't convert spot color "All"
Convert with:
PANTONE+ Solid Coated-V2_2014-M0-SpectroEye
Include other libraries
Calculation method:
Visual matching – uses more channels
Processing of undefined spot colors:
Move file to Error folder
Gamut warning:
Ignore
dE2000 limit:
3.0
Use printing sequence from document, if possible
Name:
Conversion:
Value:
Apply to:
Artios_Cut
No conversion
Images and Vectors
Artios_Inside bleed
Artios*
Pantone Yellow CVC
Output values (autom...
PANTONE+ Solid Coat...
Pantone 485 CVC
Pantone Process Black C
Pantone CVS Red
Pantone 107 CVC
0.0 0.0 0.0 0.0 0.0 0....
die
die line
Diegrn
Die 3
Registrat
50.0 40.0 40.0 100.0...
White
PANTONE 2173 C
Pantone Process Cyan C
Alternate color space ...
New...
Edit...
Delete...
Import...
Export...
The Document color space setting is: GRACoL2006_Coated1v2.icc (CMYK)
Edit Spot Color Conversion
Name:
Pantone 2727 C
Conversion:
No conversion
Alias of:
Library:
Select...
Apply to:
Images and Vectors
Calculation method:
Use same method as in configuration
Optimize output values
Automatic
Cyan
44.5
Red
0.0
Magenta
0.0
Green
0.0
Yellow
0.0
Blue
49.1
Black
0.0
DeltaE-76
DeltaE-2000
Information
Original Lab: -
Actual Lab: -
DeltaE / 2000: -
Paper white simulation
OK
Cancel


Color Server Application
Define Configurations
Configuration
Convert_Traditional Printing _GRACoL2006_Offset_7C
New...
Document Color Space
Images
Vectors
Target
Options
PDF
Apply Gradations
Convert Spot Colors
SmartLink
Convert spot colors to Target color space
Don't convert spot color "All"
Convert with:
PANTONE+ Solid Coated-V2_2014-M0-SpectroEye
Include other libraries
Calculation method:
Visual matching – uses more channels
Processing of undefined spot colors:
Move file to Error folder
Gamut warning:
Ignore
dE2000 limit:
3.0
Use printing sequence from document, if possible
Name:
Conversion:
Value:
Apply to:
Artios_Cut
No conversion
Images and Vectors
Artios_Inside bleed
Artios*
Pantone Yellow CVC
Output values (autom...
PANTONE+ Solid Coat...
Pantone 485 CVC
Pantone Process Black C
Pantone CVS Red
Pantone 107 CVC
0.0 0.0 0.0 0.0 0.0 0....
die
die line
Diegrn
Die 3
Registrat
50.0 40.0 40.0 100.0...
White
PANTONE 2173 C
Pantone Process Cyan C
Alternate color space ...
New...
Edit...
Delete...
Import...
Export...
The Document color space setting is: GRACoL2006_Coated1v2.icc (CMYK)
Edit Spot Color Conversion
Name:
Diegrn
Conversion:
No conversion
Alias of:
Library:
Select...
Apply to:
Vector
Calculation method:
Use same method as in configuration
Optimize output values
Automatic
Cyan
100.0
Red
0.0
Magenta
Green
Yellow
Blue
Black
DeltaE-76
DeltaE-2000
Information
Original Lab: -
Actual Lab: -
DeltaE / 2000: -
Paper white simulation
OK
Cancel


ZePrA
Color Server Application
ZePrA
Manage Spot Colors
Manage Color Libraries
Library:
Walgreens_C
Import...
Export...
Define spot colors
Number of spot colors
Stop
Start
ZePrA v4.6.1, (C) 2008–2015 ColorLogic GmbH
This NFR version expires 2016/02/18
Edit Spot Color
Name
FN_LtGreen
Non printing color
Edit measurements
Printed on white background (substrate)
Printed on black background (process black)
Use template:
Custom
Save as template...
25% 94.2 -12.5 12.6
50% 88.4 -25.0 25.2
100% 76.7 -50.1 50.3
L
a
b
Add...
Delete
Measure...
Import...
Opacity:
0
OK
Cancel


Color Server Application
Define Configurations
Configuration
Convert_Traditional Printing _GRACoL2006_Offset_7C
New...
Document Color Space
Images
Vectors
Target
Options
PDF
Apply Gradations
Convert
Convert spot colors to Target color space
Don't convert spot color "All"
Convert with:
PANTONE+ Solid Coated-V2_2014-M0-SpectroEye
Precise matching – proofing
Visual matching – uses more channels
Use as few channels as possible
Use up to two output channels
Calculation method:
Processing of undefined spot colors:
Gamut warning:
Ignore
dE2000 limit:
3.0
Use printing sequence from document, if possible
Name:
Conversion
Value
Apply to:
Printing sequence
Artios_Cut
No conversion
Images and Vectors
8
Artios_Inside bleed
No conversion
Images and Vectors
9
Artios*
No conversion
Images and Vectors
10
Pantone Yellow CVC
Output values (autom...
PANTONE+ Solid Coat...
Images and Vectors
11
Pantone 485 CVC
Output values (autom...
PANTONE+ Solid Coat...
Images and Vectors
12
Pantone Process Black C
Output values (autom...
PANTONE+ Solid Coat...
Images and Vectors
13
Pantone CVS Red
Output values (autom...
PANTONE+ Solid Coat...
Images and Vectors
14
Pantone 107 CVC
Output values
0.0 0.0 0.0 0.0 0.0 0....
Images and Vectors
15
die
No conversion
Images and Vectors
16
die line
No conversion
Images and Vectors
17
Diegrn
No conversion
Images and Vectors
18
Die 3
No conversion
Images and Vectors
19
Registrat
Output values
50.0 40.0 40.0 100.0...
Images and Vectors
20
White
No conversion
Images and Vectors
21
PANTONE 2173 C
Output values (autom...
PANTONE+ Solid Coat...
Images and Vectors
22
Pantone Process Cyan C
Alternate color space ...
Images and Vectors
23
New...
Edit...
Delete...
Import...
Export...
The Document color space setting is: GRACoL2006_Coated1v2.icc (CMYK)

Batch Processing



Job Reporting

PDF/X information

PDF/X version:	PDF/X-3:2003
Output Intent:	GRACoL2006_Coated1v2
Output Condition Identifier:	GRACoL2006_Coated1v2
Output Intent Info:	GRACoL2006_Coated1v2

Processing information

Date:	2014-7-24 11:12:41
Configuration:	Output_GRACoL2006_Coated1v2_ASG_8C_SBS_Uncal_June24_2014
Warnings:	The dE2000 threshold has been exceeded for one or more spot colors (details in the job properties)
New Output Intent:	
Signatures (removed):	
SmartLink:	ASG_SBS_CMYK_Uncal_June24_2014.icc --> ASG_8C_SBS_Uncal_June24_2014_V2.icc (CMYK-to-Multicolor-TraditionalPrint-AutoExceptions)
Embedded Profiles:	None

Spot colors processing

All	Preserved
PANTONE 1485 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 4.1
PANTONE 176 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.3
PANTONE 1765 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 4.4
PANTONE 177 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.4
PANTONE 189 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 2.5
PANTONE 1895 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 2.2
PANTONE 211 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.3
PANTONE 223 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 2.9
PANTONE 224 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 2.7
PANTONE 230 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.4
PANTONE 231 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.7
PANTONE 236 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.3
PANTONE 2365 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 2.5
PANTONE 237 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.5
PANTONE 238 C	Automatically converted, Library:: PANTONE+ Solid Coated, dE2000: 3.0

Server-Based Conversions: Advantages/Challenges

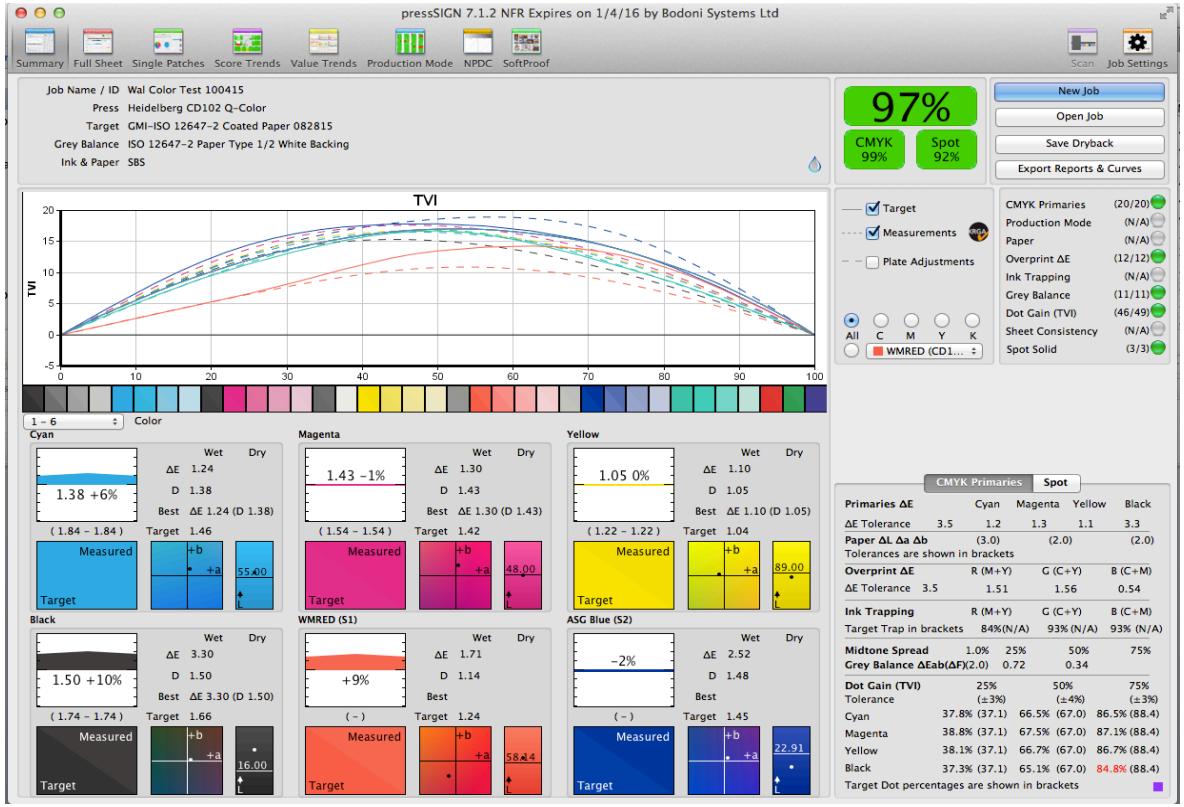
Advantages:

- Fast—seconds to minutes
- Far more accurate: Tints, blends, overprints can be simulated
- Accurate proofing is possible

Challenges:

- Must make assumptions about spot color “behavior” in tints and overprints: gain, wet-trapping, etc., as basis for the conversion to n-color, if additional information is unavailable
- Conversion must balance accuracy with minimum number of colors used

EG in the Pressroom: Process Control


pressSIGN 7.1.2 NFR Expires on 1/4/16 by Bodoni Systems Ltd
Summary
Full Sheet
Single Patches
Score Trends
Value Trends
Production Mode
NPDC
SoftProof
Scan
Job Settings
Job Name / ID Wal Color Test 100415
Press Heidelberg CD102 Q-Color
Target GMI-ISO 12647-2 Coated Paper 082815
Grey Balance ISO 12647-2 Paper Type 1/2 White Backing
Ink & Paper SBS
97%
CMYK 99%
Spot 92%
New Job
Open Job
Save Dryback
Export Reports & Curves
TVI
Target
Measurements
Plate Adjustments
All C M Y K
WMRED (CD1...
CMYK Primaries (20/20)
Production Mode (N/A)
Paper (N/A)
Overprint ΔE (12/12)
Ink Trapping (N/A)
Grey Balance (11/11)
Dot Gain (TVI) (46/49)
Sheet Consistency (N/A)
Spot Solid (3/3)
1 - 6
Color
Cyan
1.38 +6%
(1.84 - 1.84)
Wet Dry
ΔE 1.24
D 1.38
Best ΔE 1.24 (D 1.38)
Target 1.46
Measured
Target
Magenta
1.43 -1%
(1.54 - 1.54)
ΔE 1.30
D 1.43
Best ΔE 1.30 (D 1.43)
Target 1.42
Yellow
1.05 0%
(1.22 - 1.22)
ΔE 1.10
D 1.05
Best ΔE 1.10 (D 1.05)
Target 1.04
Black
1.50 +10%
(1.74 - 1.74)
ΔE 3.30
D 1.50
Best ΔE 3.30 (D 1.50)
Target 1.66
WMRED (S1)
+9%
(-)
ΔE 1.71
D 1.14
Best
Target 1.24
ASG Blue (S2)
-2%
(-)
ΔE 2.52
D 1.48
Best
Target 1.45
CMYK Primaries
Spot
Primaries ΔE Cyan Magenta Yellow Black
ΔE Tolerance 3.5 1.2 1.3 1.1 3.3
Paper ΔL Δa Δb (3.0) (2.0) (2.0)
Tolerances are shown in brackets
Overprint ΔE R (M+Y) G (C+Y) B (C+M)
ΔE Tolerance 3.5 1.51 1.56 0.54
Ink Trapping R (M+Y) G (C+Y) B (C+M)
Target Trap in brackets 84%(N/A) 93% (N/A) 93% (N/A)
Midtone Spread 1.0% 25% 50% 75%
Grey Balance ΔEab(ΔF)(2.0) 0.72 0.34
Dot Gain (TVI) 25% 50% 75%
Tolerance (±3%) (±4%) (±3%)
Cyan 37.8% (37.1) 66.5% (67.0) 86.5% (88.4)
Magenta 38.8% (37.1) 67.5% (67.0) 87.1% (88.4)
Yellow 38.1% (37.1) 66.7% (67.0) 86.7% (88.4)
Black 37.3% (37.1) 65.1% (67.0) 84.8% (88.4)
Target Dot percentages are shown in brackets

EG Process Control Tips

- Include a complete G7 color bar with the additional colors and their tints
- Monitor solids and TVI on *all* colors!
- Monitor CMY gray balance—It still matters!
- Include patches of the simulated target brand colors
- Target is the color specification, not a swatch book!
- Helpful to build output space around a “core” of G7 CMYK

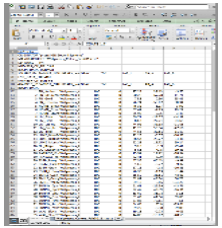
Pleasing the Customer: What are the expectations?

Problem: All colors cannot be matched

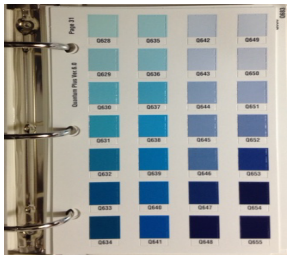
- Possible strategies:
  - Qualify many colors as-is, print remainders as specials?
  - Qualify most colors with adjusted aims, print remainders as specials?
- Policing compliance: print quality management (PQM) programs

EG Sales Tools

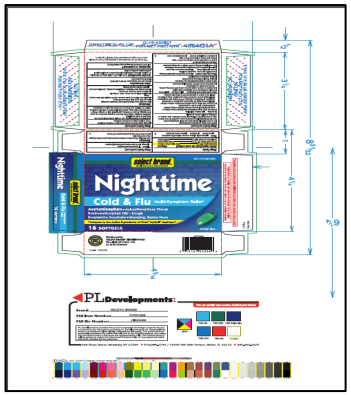
Color approval list



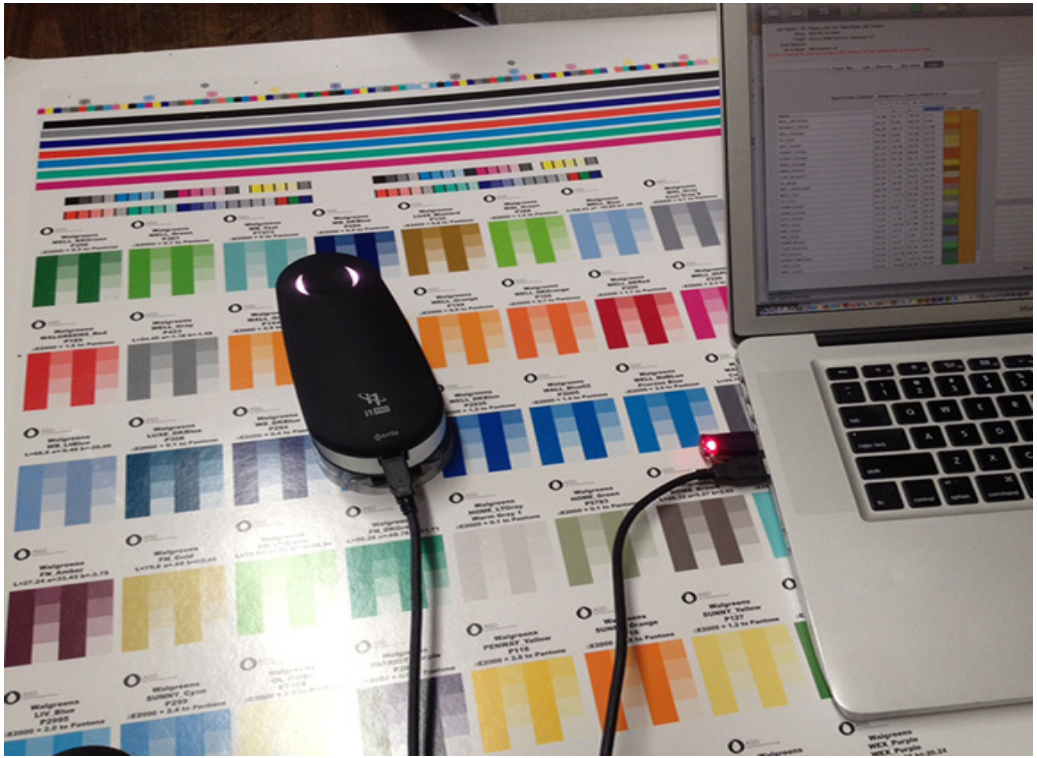
Swatch Book



Proof or “OK” sheet



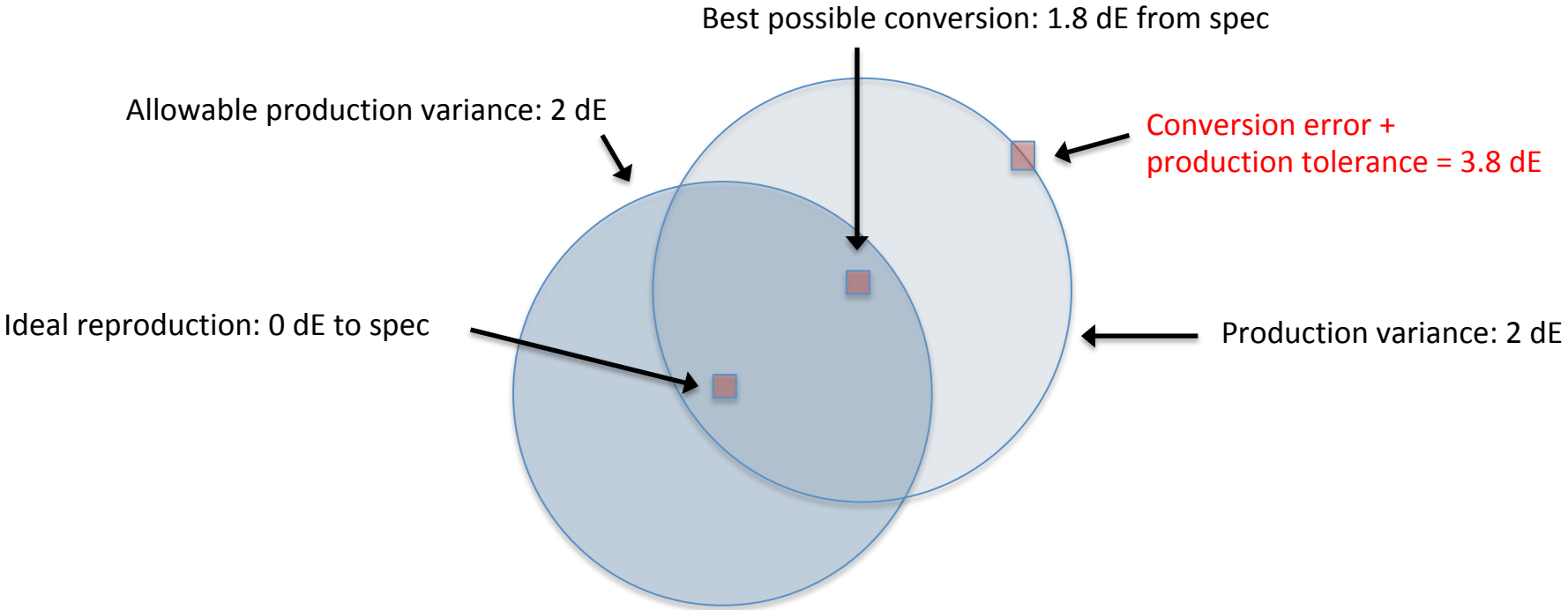
Aims and Tolerances



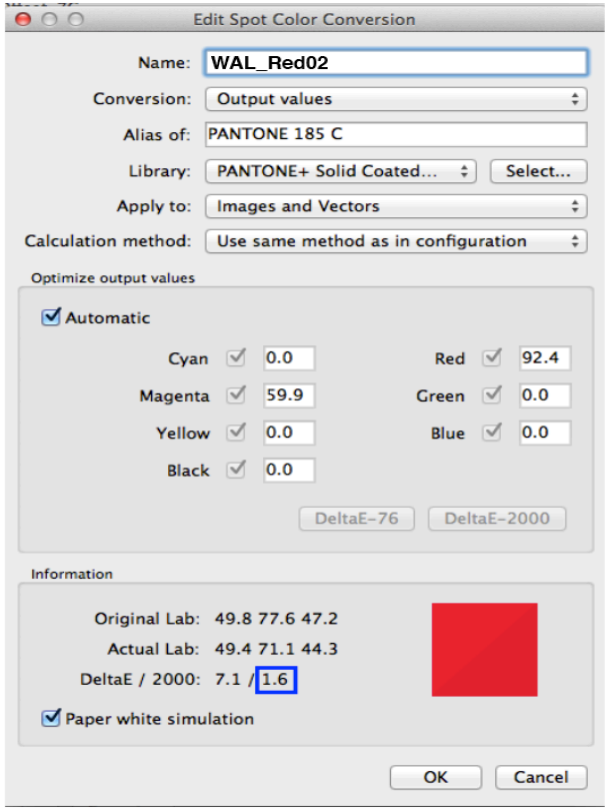
Assessing the Match

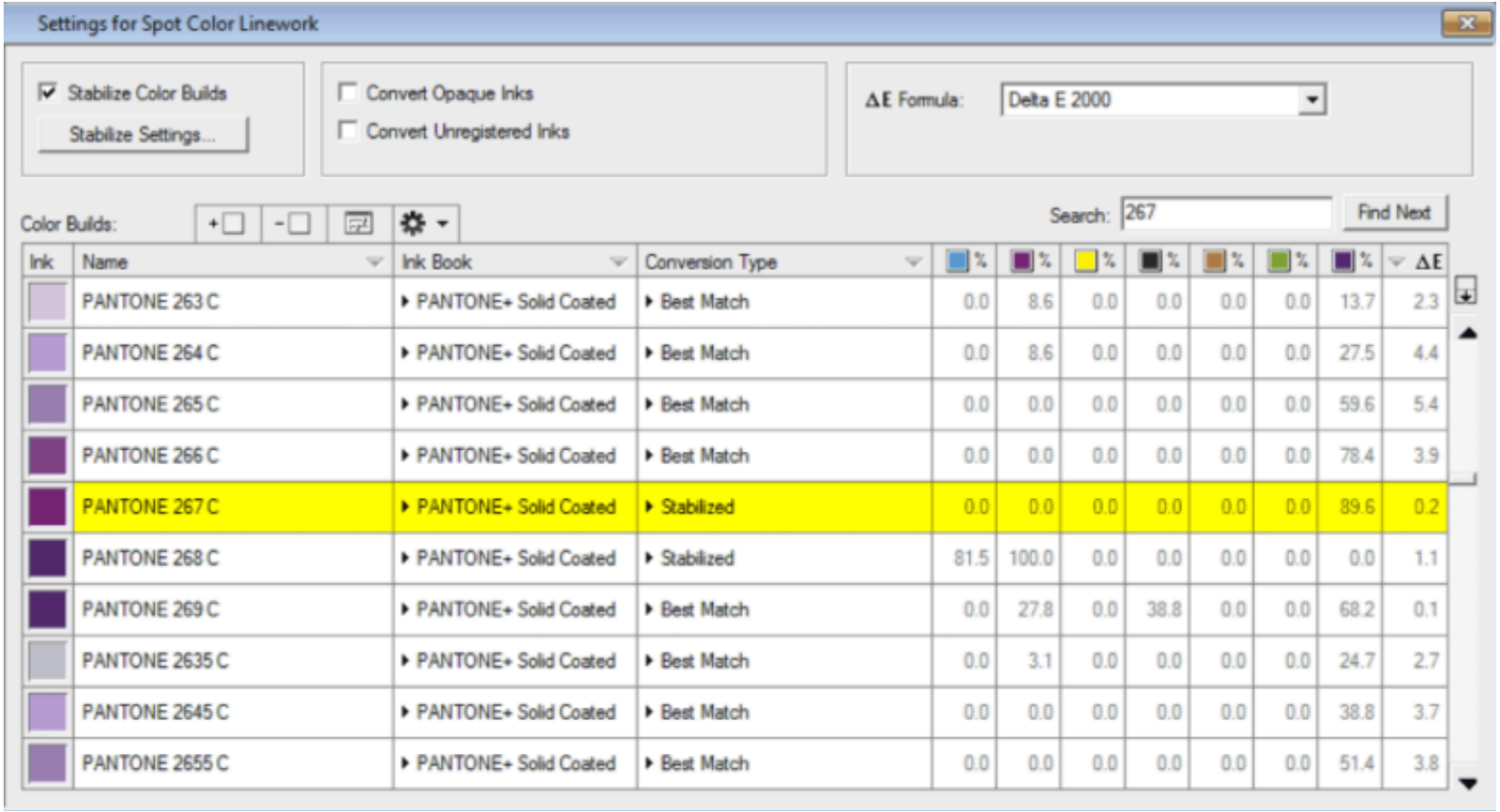
	Orig Ref			Pred MIN dE00	Meas Lab			Meas dE00
FN_Amber	27.2	33.4	-3.8	0.6	28.3	30.4	-5.0	1.7
FN_Gold	75.8	0.7	55.5	0.1	75.9	0.7	55.2	0.1
FN_LTGreen	76.5	-50.1	50.1	4.0	74.2	-36.4	46.5	**4.9**
HOME_Brown	46.3	5.3	3.9	0.0	46.9	4.2	4.2	1.5
HOME_Green	68.1	-6.2	16.6	0.1	67.9	-6.7	16.8	1.4
LIV_Lime	85.4	-21.8	93.5	2.8	82.1	-20.2	79.0	**3.8**
LIV_Teal	75.4	-31.5	-13.0	1.4	72.7	-30.2	-10.9	2.4
LUXE_BLUEGRAY	74.6	-3.7	-14.1	0.0	74.3	-3.4	-12.8	0.9
LUXE_DKBlue	31.2	-27.1	-33.8	0.1	31.1	-25.2	-30.6	1.3
LUXE_Mustard	52.4	12.8	59.0	0.6	52.6	12.5	55.5	1.0
OL_Beige	91.5	-0.6	22.6	2.5	90.8	-2.6	22.8	**2.0**
Penway_Yellow	85.5	8.4	88.0	2.8	81.9	6.9	85.5	**2.6**
S35B_BERRY	47.4	60.4	10.0	0.3	50.4	54.2	-11.1	3.5
S35U_Gray	57.2	-2.8	-10.6	0.1	57.3	-2.9	-10.5	0.2
Sunny Cyan	61.3	-22.2	-47.6	2.4	61.3	-22.4	-40.5	**3.6**
SUNNY_DPGreen	52.5	-35.0	41.0	0.2	51.0	-34.7	32.6	3.8
Sunny_Orange	63.5	42.3	72.2	1.8	65.9	44.2	75.7	**4.2**
Sunny_Yellow	88.4	-0.7	53.9	1.2	87.0	0.2	51.8	1.2
WAL_Blue02	44.0	-19.8	-59.5	1.4	42.0	-17.9	-52.6	2.3
WAL_DKGray	43.1	0.3	-4.6	0.1	56.1	-1.5	-2.3	2.2
WAL_DKPurple	27.2	28.3	-11.3	0.0	27.5	23.9	-11.3	2.2
WAL_Gray	57.6	0.6	-4.5	0.1	56.1	-1.5	-2.3	3.7
WAL_Green	69.9	-40.3	62.1	1.4	71.0	-41.3	65.0	0.9
WB_DKBlue	18.6	4.9	-43.7	0.1	18.3	4.1	-42.8	0.4
WB_LtBlue	68.8	-9.5	-29.7	0.9	65.6	-9.8	-27.0	2.8
WB_Teal	68.7	-29.0	-9.8	0.1	68.8	-27.6	-8.7	0.8
WELL_Blue	69.4	-10.7	-22.6	1.3	69.9	-10.0	-23.6	0.7
WELL_DKBlue	34.4	-0.6	-66.2	1.2	33.1	-4.5	-56.5	4.1
WELL_DKGreen	43.2	-50.5	26.6	0.3	41.9	-46.2	21.1	1.8
WELL_DkPink	45.0	80.5	-2.8	2.3	49.7	70.8	-3.6	**5.5**
WELL_DKRed	41.4	65.7	32.9	1.1	42.3	66.8	29.5	2.6
WELL_DKTeal	44.7	-43.2	-37.2	0.3	42.4	-42.0	-35.0	2.1
WELL_DKYellow	75.1	22.3	82.8	0.3	75.6	20.4	81.8	2.1
WELL_Gray	58.1	-0.1	-4.0	0.1	56.1	-1.5	-2.3	1.0
WELL_Green	63.0	40.9	52.4	0.1	62.9	-47.4	51.5	1.1
WELL_MdBlue	47.6	-32.0	-55.1	3.0	49.9	-28.4	-48.2	**3.1**
WELL_Orange	68.2	35.5	75.2	0.9	69.3	35.9	79.5	3.3
WEST_Amber	24.6	24.2	9.8	0.0	24.6	24.2	9.8	2.0
WEST_Tan	69.3	10.9	10.5	0.1	70.3	8.6	11.7	2.8
WEX_Purple	27.9	28.9	20.2	0.0	28.4	24.0	-21.3	2.9
WEX_Yellow	85.0	3.9	69.4	0.9	83.7	5.4	65.8	1.6
							Avg	**2.2**

The Vicious Circles of Tolerance!



Adjusting the Reference




Settings for Spot Color Linework
Stabilize Color Builds
Stabilize Settings...
Convert Opaque Inks
Convert Unregistered Inks
ΔE Formula:
Delta E 2000
Color Builds:
Search:
267
Find Next
Ink
Name
Ink Book
Conversion Type
%
%
%
%
%
%
%
ΔE
PANTONE 263 C
PANTONE+ Solid Coated
Best Match
0.0 8.6 0.0 0.0 0.0 0.0 13.7 2.3
PANTONE 264 C
PANTONE+ Solid Coated
Best Match
0.0 8.6 0.0 0.0 0.0 0.0 27.5 4.4
PANTONE 265 C
PANTONE+ Solid Coated
Best Match
0.0 0.0 0.0 0.0 0.0 0.0 59.6 5.4
PANTONE 266 C
PANTONE+ Solid Coated
Best Match
0.0 0.0 0.0 0.0 0.0 0.0 78.4 3.9
PANTONE 267 C
PANTONE+ Solid Coated
Stabilized
0.0 0.0 0.0 0.0 0.0 0.0 89.6 0.2
PANTONE 268 C
PANTONE+ Solid Coated
Stabilized
81.5 100.0 0.0 0.0 0.0 0.0 0.0 1.1
PANTONE 269 C
PANTONE+ Solid Coated
Best Match
0.0 27.8 0.0 38.8 0.0 0.0 68.2 0.1
PANTONE 2635 C
PANTONE+ Solid Coated
Best Match
0.0 3.1 0.0 0.0 0.0 0.0 24.7 2.7
PANTONE 2645 C
PANTONE+ Solid Coated
Best Match
0.0 0.0 0.0 0.0 0.0 0.0 38.8 3.7
PANTONE 2655 C
PANTONE+ Solid Coated
Best Match
0.0 0.0 0.0 0.0 0.0 0.0 51.4 3.8

Adjusting the Reference

	Orig Ref			Pred MIN dE00	Meas Lab			Meas dE00	Adjusted Ref			Meas dE00	Change/impovement
FN_Amber	27.2	33.4	-3.8	0.6	28.3	30.4	-5.0	1.7					
FN_Gold	75.8	0.7	55.5	0.1	75.9	0.7	55.2	0.1					
FN_LTGreen	76.5	-50.1	50.1	4.0	74.2	-36.4	46.5	4.9	72.9	-40.9	45.3	2.3	2.6
HOME_Brown	46.3	5.3	3.9	0.0	46.9	4.2	4.2	1.5					
HOME_Green	68.1	-6.2	16.6	0.1	67.9	-6.7	16.8	1.4					
LIV_Lime	85.4	-21.8	93.5	2.8	82.1	-20.2	79.0	3.8	83.0	-17.4	83.9	2.2	1.6
LIV_Teal	75.4	-31.5	-13.0	1.4	72.7	-30.2	-10.9	2.4					
LUXE_BLUEGRAY	74.6	-3.7	-14.1	0.0	74.3	-3.4	-12.8	0.9					
LUXE_DKBlue	31.2	-27.1	-33.8	0.1	31.1	-25.2	-30.6	1.3					
LUXE_Mustard	52.4	12.8	59.0	0.6	52.6	12.5	55.5	1.0					
OL_Beige	91.5	-0.6	22.6	2.5	90.8	-2.6	22.8	2.0	90.6	-3.0	22.2	0.5	1.5
Penway_Yellow	85.5	8.4	88.0	2.8	81.9	6.9	85.5	2.6	81.8	6.0	87.1	0.7	1.9
S35B_BERRY	47.4	60.4	10.0	0.3	50.4	54.2	-11.1	3.5					
S35U_Gray	57.2	-2.8	-10.6	0.1	57.3	-2.9	-10.5	0.2					
Sunny Cyan	61.3	-22.2	-47.6	2.4	61.3	-22.4	-40.5	3.6	60.3	-22.4	-47.6	2.0	1.6
SUNNY_DPGreen	52.5	-35.0	41.0	0.2	51.0	-34.7	32.6	3.8					
Sunny_Orange	63.5	42.3	72.2	1.8	65.9	44.2	75.7	4.2	74.7	46.5	77.3	1.3	2.9
Sunny_Yellow	88.4	-0.7	53.9	1.2	87.0	0.2	51.8	1.2					
WAL_Blue02	44.0	-19.8	-59.5	1.4	42.0	-17.9	-52.6	2.3					
WAL_DKGray	43.1	0.3	-4.6	0.1	56.1	-1.5	-2.3	2.2					
WAL_DKPurple	27.2	28.3	-11.3	0.0	27.5	23.9	-11.3	2.2					
WAL_Gray	57.6	0.6	-4.5	0.1	56.1	-1.5	-2.3	3.7					
WAL_Green	69.9	-40.3	62.1	1.4	71.0	-41.3	65.0	0.9					
WB_DKBlue	18.6	4.9	-43.7	0.1	18.3	4.1	-42.8	0.4					
WB_LtBlue	68.8	-9.5	-29.7	0.9	65.6	-9.8	-27.0	2.8					
WB_Teal	68.7	-29.0	-9.8	0.1	68.8	-27.6	-8.7	0.8					
WELL_Blue	69.4	-10.7	-22.6	1.3	69.9	-10.0	-23.6	0.7					
WELL_DKBlue	34.4	-0.6	-66.2	1.2	33.1	-4.5	-56.5	4.1					
WELL_DKGreen	43.2	-50.5	26.6	0.3	41.9	-46.2	21.1	1.8					
WELL_DkPink	45.0	80.5	-2.8	2.3	49.7	70.8	-3.6	5.5	46.8	74.0	-1.4	1.4	4.1
WELL_DKRed	41.4	65.7	32.9	1.1	42.3	66.8	29.5	2.6					
WELL_DKTeal	44.7	-43.2	-37.2	0.3	42.4	-42.0	-35.0	2.1					
WELL_DKYellow	75.1	22.3	82.8	0.3	75.6	20.4	81.8	2.1					
WELL_Gray	58.1	-0.1	-4.0	0.1	56.1	-1.5	-2.3	1.0					
WELL_Green	63.0	40.9	52.4	0.1	62.9	-47.4	51.5	1.1					
WELL_MdBlue	47.6	-32.0	-55.1	3.0	49.9	-28.4	-48.2	3.1	49.2	-25.9	-49.2	1.4	1.7
WELL_Orange	68.2	35.5	75.2	0.9	69.3	35.9	79.5	3.3					
WEST_Amber	24.6	24.2	9.8	0.0	24.6	24.2	9.8	2.0					
WEST_Tan	69.3	10.9	10.5	0.1	70.3	8.6	11.7	2.8					
WEX_Purple	27.9	28.9	20.2	0.0	28.4	24.0	-21.3	2.9					
WEX_Yellow	85.0	3.9	69.4	0.9	83.7	5.4	65.8	1.6					

The EG Process Overview

Customer

Expectations/specifications

EG Swatch book

Prepress/Printer

EG Color Approval List

Agreed tolerance

Prepped, preflighted job

Color server

EG Proof

N-color separations + “specials”

Measurement
Compliance reporting

Tips for Print Buyers

- Understand the tradeoff of EG: Lower cost and possible loss of brand color accuracy
- Insist on color approval lists and sample books
- Develop a realistic house specification for color matching
- Look for printers using *color-managed* EG systems and advanced process control
- Insist on contract proofs for all new SKUs

Tips for Printing and Prepress

- Build the system for tomorrow's needs: Old EG "lookup and rework" systems don't cut it.
- Centralize file prep and use "golden" source files.
- Build around conventional CMYK inks and a gray-balanced color space (e.g., GRACoL).
- *Preemptively* communicate color visually with customers by sample books and proofs
- Understand colorimetric tolerances and embed them in production practice--run to the numbers, *not* swatch books
- Use automation to streamline and standardize file conversions and plan production

Thanks to

Bodoni Systems

Chromix

ColorLogic GMBH

Esko

Graphic Measures International

Pantone

Sun Chemical

Bruce Bayne