



INTERNATIONAL
PRINECT USER DAYS

8th and 9th October 2014

5. International Prinect User Days, October 8th and 9th, 2014

Color Tool 2015

Dr. Sehran Tatari, Dr. Stefan Bollmann



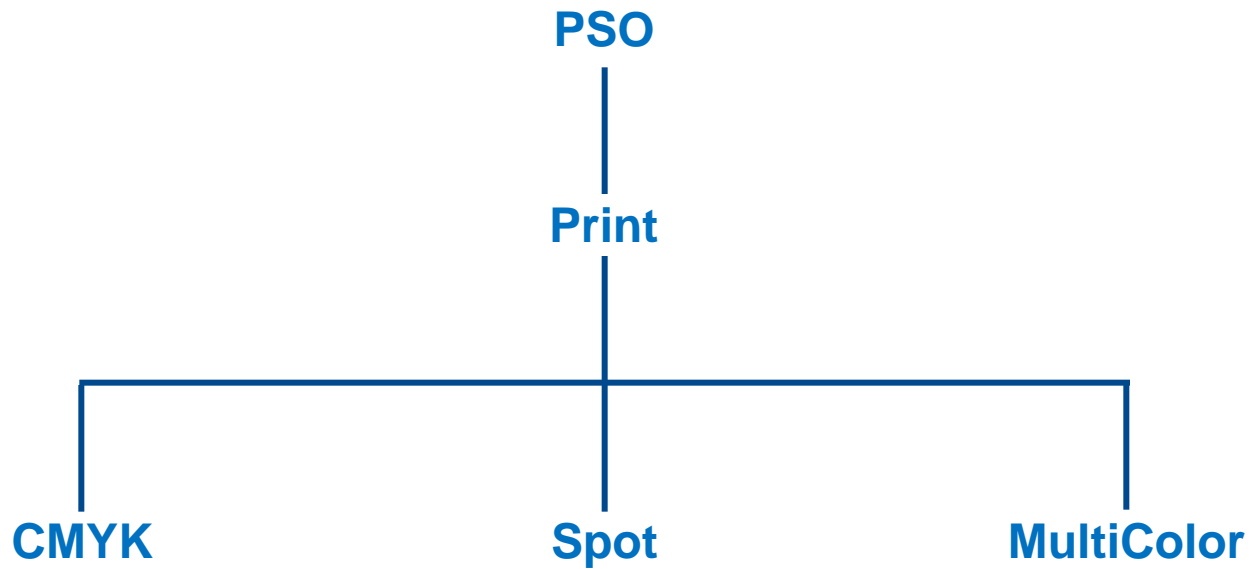
HEIDELBERG



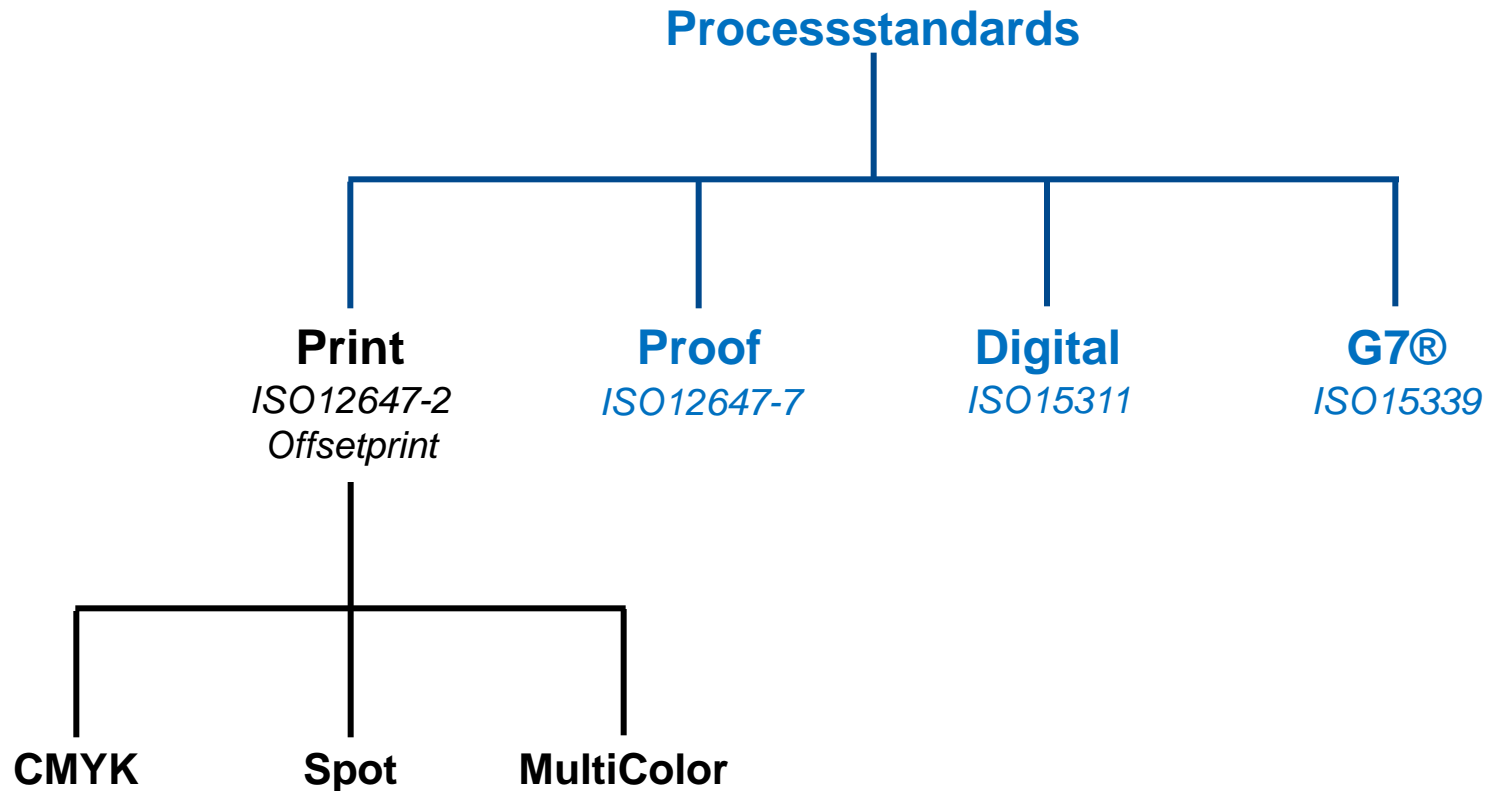
Agenda

1. Processstandards: *New Types*
2. **PSD: P**rocess **S**tandard **D**igital
3. Processstandard **GRACOL G7 (CGATS)**
4. Profile Tool: **Less GCR/K in skintones**
5. Supported measuring devices
6. **Working with spot colors** (*Prinect 2016*)

Color Tool: Prozessstandards *Actual: only offset-print*



Color Tool: **New** Processtandard - Types



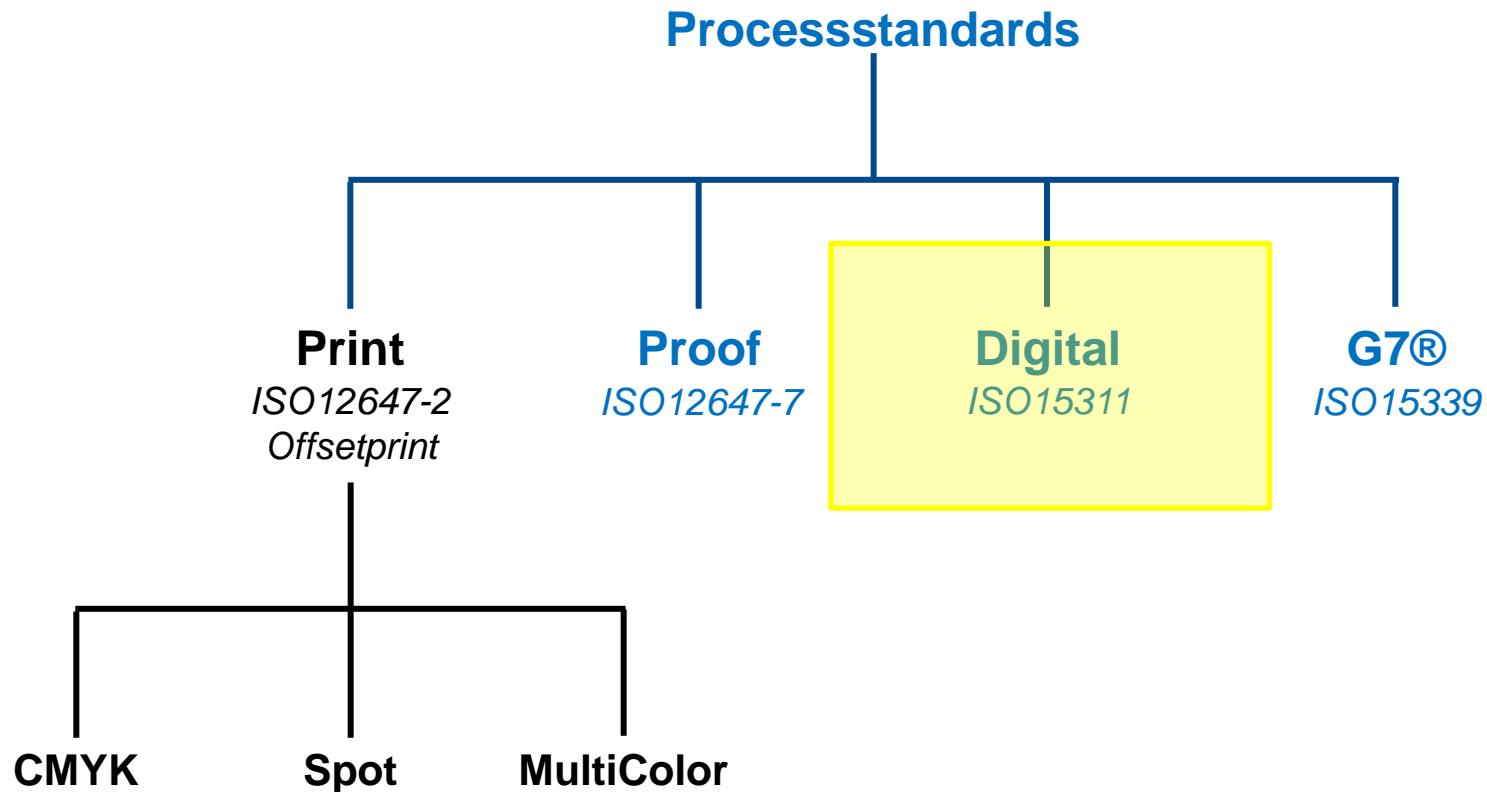


Processtandard **Digital-Print [PSD]**: ISO 15311

NEW



Color Tool: **New Processstandard – Types: Digital-Print**



Procedure for Digital Print check



FOGRA media wedge CMYK V3



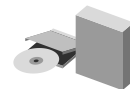
generate
pdf



digital print



measure
Color Tool



C901



PSD-Check: *How to measure?*

4 spectral measurement conditions:

1. **M0**: unspecified illumination (*nearly all measurement devices, legacy*)
2. **M1**: D50(daylight) illumination *optimal*
3. **M2**: UV-cut -filter (*IC-NG*)
4. **M3**: M2 + polarization filter (*Inpress*)

Standard specifies **M1 or M0**, but:

- Standard refers to FOGRA39-offset (**M0**) of 2007
- FOGRA39: no UV-brighteners
- Most Digital-Print papers have substantial UV-brighteners

→ **Practical experience: best result with M2 (UVcut)**



PSD-Check: *CMM-Background*

CMYK
ISOcoated_v2_eci



Digital device:

- different printing technology than offset-print
- different inks

} own CMYK-ICC-profile

→ inherent color management necessary



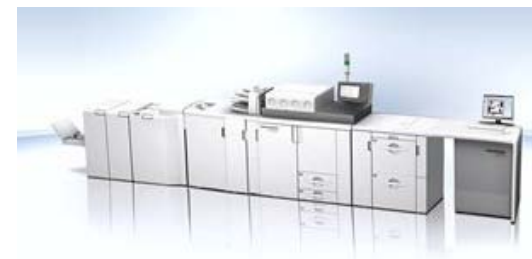
PSD-Check: *color management in digital device*



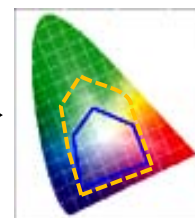
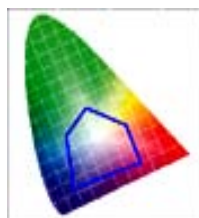
ISOcoated_
v2_eci



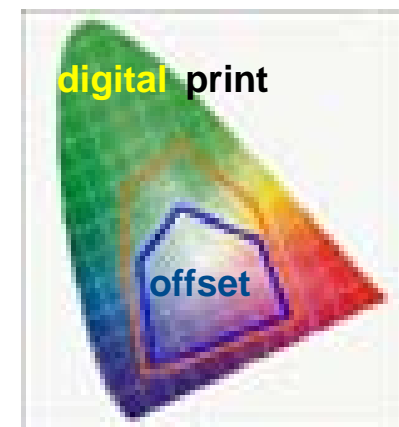
digital-print
ICC-profile



- Digital-print identical to offset → **no gamut mapping**
- Digital color gamut of **larger or identical** than offset-gamut

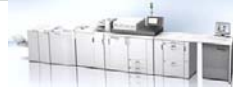


same gamut
in Lab



Rendering intent: relative or absolute (like in proof)

→ Process Standard Digital [PSD] checks: **How well is it done?**



PSD-Check: *What is checked?*



1. Primary colors
2. Secondary / tertiary colors and trapping
3. Half tones
4. Gray axis
5. Substrate

Check by comparison with an internal characterization-set as reference:

- compare measured values against reference values
- mean and maximum deviations

Internal characterization-set as reference: Possible reference sets

- Coated: FOGRA39L 2007
- Uncoated: FOGRA47L 2007



Process standard Digital [PSD]: *Properties 1*

ΔE_{00} : inverse weighting by chroma

- more sensible in neutral areas
- insensible with saturated colors

- Used color-distance: only ΔE_{00}
- introduces 3 quality levels for check:

A=high[*proof*]

B=good[*offset*]

C=acceptable[*office*]

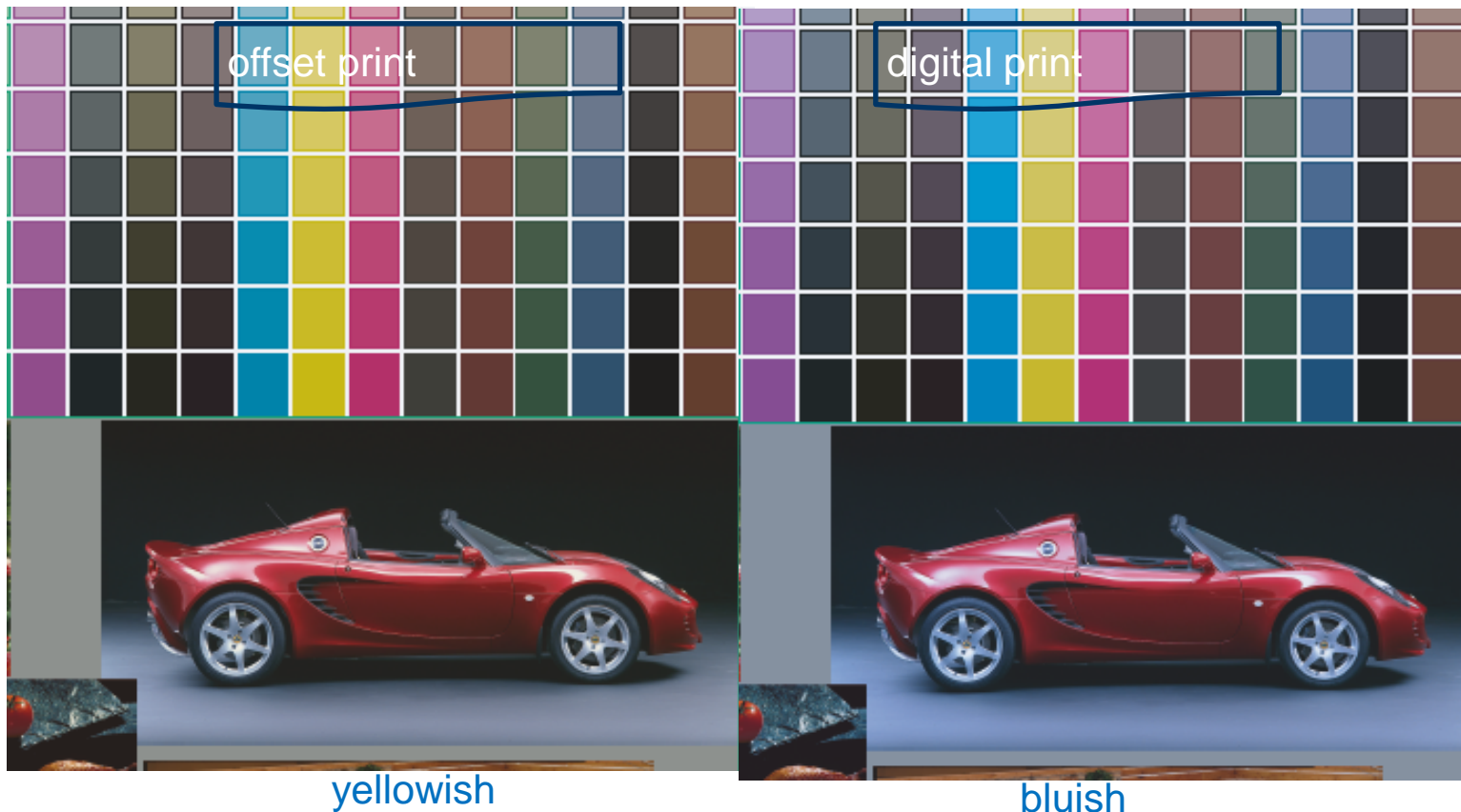
	A[<i>proof</i>]	B[<i>offset</i>]	C[<i>office</i>]
Substrate	$\Delta E_{00} \leq 2.5$	$\Delta E_{00} \leq 3.5$	$\Delta E_{00} \leq 4.5$
All Patches (except Substrate)	Max. $\Delta E_{00} \leq 6.5$ Mean $\Delta E_{00} \leq 2.5$	Max. $\Delta E_{00} \leq 7.5$ Mean $\Delta E_{00} \leq 3.5$	Max. $\Delta E_{00} \leq 8.5$ Mean $\Delta E_{00} \leq 4.5$
CMYKRGB	Max. $\Delta H_{ab} \leq 4.5$	Max. $\Delta H_{ab} \leq 5.5$	Max. $\Delta H_{ab} \leq 6.5$
Gray Reproduction	Mean $\Delta C_h \leq 2.5$	Mean $\Delta C_h \leq 3.5$	Mean $\Delta C_h \leq 4.5$

Process standard Digital-check: *Properties 2a*



➤ introducing 2 comparison/check – approaches: 1

- **Side-by-Side** (*classic approach, but more difficult*)

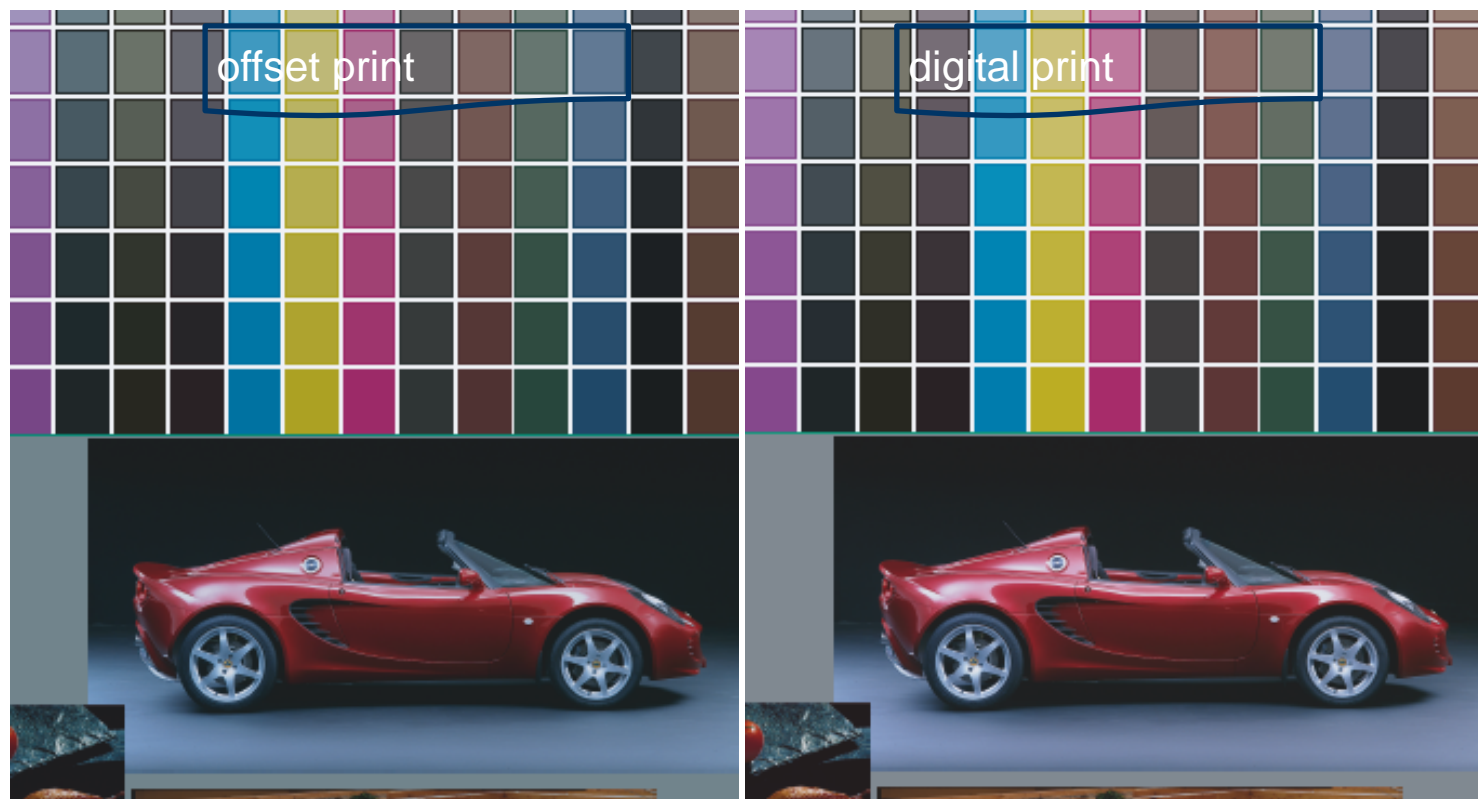


Process standard Digital-check: *Properties 2b*



➤ introducing 2 comparison/check – approaches: **2**

- **Media-Relative** (*new, easier to fulfill*) **virtual paperwhite L=100/0/0**



→ no influence of substrate!

→ virtual check

Process standard Digital-check: *Properties 2c*

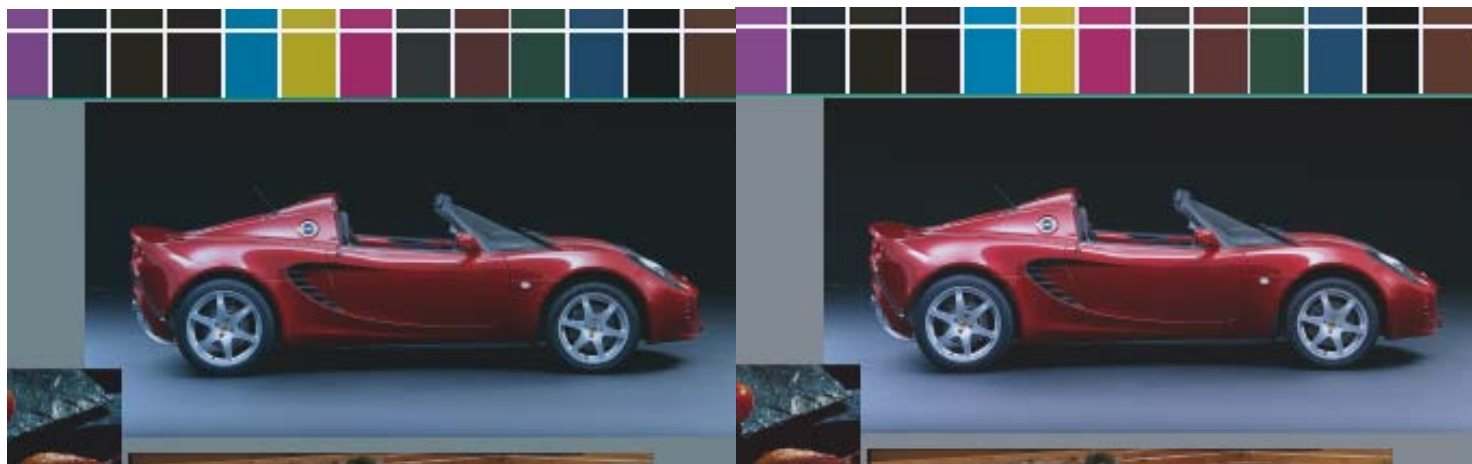


- **Side-by-Side**



- **Media-Relative**

virtual paperwhite L=100/0/0





PSD-Check: *Which elements?*

Minispots / testcharts to be checked:

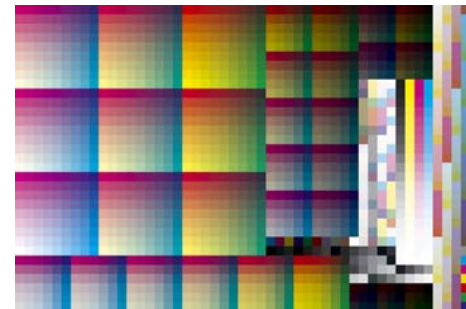
➤ *Standard-Check*

- FOGRA media wedge v3
- IDEAlliance Control Strip 2009 (already supported; different name: „GRACOL-DCS“)
- IDEAlliance Control Strip 2013



➤ *Extended-Check: Testchart for setup & profiling*

- Testcharts (ISO 12642-2) = IT8.7/4 + ECI2002
 - visual + random



➤ All other elements → **Warning**



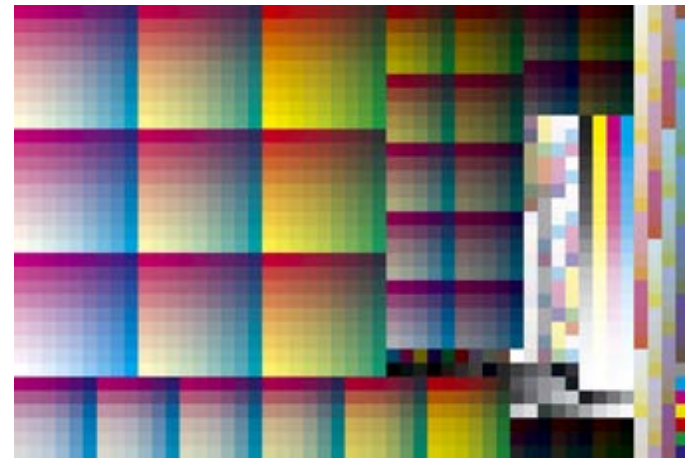
Process standard Digital-check: *Properties 3*

- consists of two checks
 - standard-check for minispots

FOGRA media wedge CMYK V3



- extended-check for testcharts (setup, profile-generation, iteration)
 - Mean-value of all patches
 - Mean-value of saturated color-patches
 - deviation of 95% -percentile of all patches





PSD-check to Proof-check: *Compare*

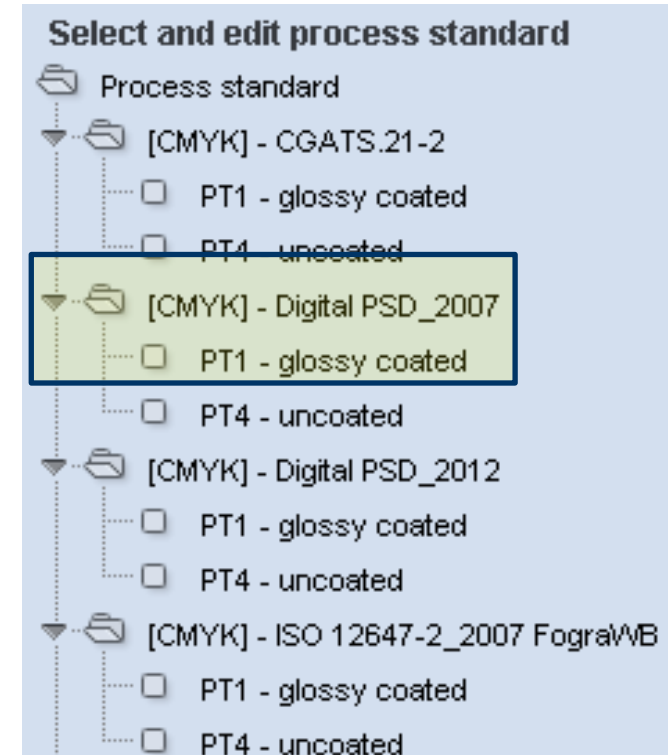
- PSD-check and Proof-check: Similarities
 - standard and extended check
 - same internal characterization-sets as reference

- Differences:
 - PSD checks more, innovative,
 - PSD: ΔE_{00} Proof: ΔE_{ab}
 - PSD: 3 quality levels Proof: 1 quality level
 - PSD: 2 different checks Proof: 1 check (side-by-side)
 - differ also in evaluation of identical elements



Color Tool: Steps of PSD-check

1. Select a digital print-processstandard
2. Measure your element or open your measured data
3. Make in „Measure“ your PSD-check





Color Tool: *Select a digital print-process standard*

Measure Compare Analysis Create Edit **Process standard**

Standard: Digital PSD_2007 CMYK Printing Material: PT1 - glossy coated

PS Norm Type: Digital Delta E Type: Delta E2000 Density status: ISO 5-3 Status E

CharacterizationDataSet: FOGRA39L.bt **Internal reference file**

Comment: Digital printing according to ISO12647-2:2007, Reference FOGRA39, White Backing, glossy coated PT1

- Show dot gain curves
- Show dot gain values
- Show paper white
- Show CIELAB color values and density values
- Show Gray balance parameter
- Show G7 parameter
- Hide digital parameter

Ok-Sheet Requirements Side-by-Side	A	B	C	Applicability Media relative	A	B	C
Substrat difference ΔE_{00}	2.50	3.50	4.50	White point difference ΔE_{00}	6.50	8.50	11.50
All patches maximum ΔE_{00}	6.50	7.50	8.50	Black point difference ΔL	3.50	10.50	15.50
All patches average ΔE_{00}	2.50	3.50	4.50	Ok-Sheet Requirements Media relative			
C,M,Y,R,G,B maximum ΔHab	4.50	5.50	6.50	All patches average ΔE_{00}	1.50	2.50	4.50
Near neutral average ΔCh	2.50	3.50	4.50	All patches 95% Percentile ΔE_{00}	5.50	7.50	10.50
Extended Requirements Side-by-Side				Extended Requirements Media relative			
Gamut patches average ΔE_{00}	3.50	5.50	7.50	Gamut patches average ΔE_{00}	3.50	5.50	7.50
All patches average ΔE_{00}	3.50	5.50	7.50	All patches average ΔE_{00}	3.50	5.50	7.50
All patches 95% Percentile ΔE_{00}	5.50	7.50	10.50	All patches 95% Percentile ΔE_{00}	5.50	7.50	10.50

Show proof parameter
Show print order

Import Export Dry -> Wet

Standard: [CMYK] - Digital PSD_2007 **PS Norm Type: Digital** Printing Material: glossy coated

Color Tool: *PSD – check* Standard



ΔE_{00}

Measure Compare Analysis Create Edit Process standard

Check measurement data for compliance with process standard

Hide process standard overview

CIELAB color values

ab diagram

Substrate (paper)

	Paper	Δ
L	95.2	0.2
a	0.0	0.0
b	-2.0	0.0
ΔE_{00}	--	0.1
A	B	C
2.5	3.5	4.5

Substrate= paper white

Primary & secondary colors

Side-by-Side

Ok-Sheet Requirements Side-b...	Δ	A	B	C
Substrat difference ΔE_{00}	0.2	2.5	3.5	4.5
All patches maximum ΔE_{00}	1.5	6.5	7.5	8.5
All patches average ΔE_{00}	0.5	2.5	3.5	4.5
C,M,Y,R,G,B maximum ΔHab	1.3	4.5	5.5	6.5
Near neutral average ΔCh	0.4	2.5	3.5	4.5

Media-Relative

Applicability Media relative	Δ	A	B	C
White point difference ΔE_{00}	0.2	6.5	8.5	11.5
Black point difference ΔL	0.5	3.5	10.5	15.5

Ok-Sheet Requirements Media...	Δ	A	B	C
All patches average ΔE_{00}	0.6	1.5	2.5	4.5
All patches 95% Percentile ΔE_{00}	1.4	5.5	7.5	10.5

Extended Requirements Side-b...	Δ	A	B	C
Gamut patches average ΔE_{00}	--	3.5	5.5	7.5
All patches average ΔE_{00}	--	1.5	2.5	4.5
All patches 95% Percentile ΔE_{00}	--	5.5	7.5	10.5

Extended Requirements Media...	Δ	A	B	C
Gamut patches average ΔE_{00}	--	3.5	5.5	7.5
All patches average ΔE_{00}	--	1.5	2.5	4.5
All patches 95% Percentile ΔE_{00}	--	5.5	7.5	10.5

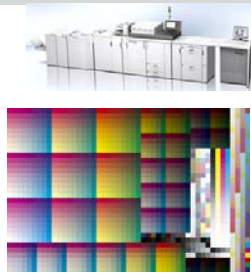
Standard check of control strip

New Open Measure Process parameters Save

File name: Check-epson4800-heaven42.bt <M0>

Standard: [CMYK] - Digital_2007WB PS Norm Type: Digital Printing Material: glossy coated

Color Tool: PSD – check Extended



Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

Measure Compare Analysis Create Edit Process standard

Check measurement data for compliance with process standard

Hide process standard overview

CIELAB color values

ΔE00	3.7	0.7	1.4	0.3	1.0	3.0	1.2	0.5
------	-----	-----	-----	-----	-----	-----	-----	-----

ab diagram

Substrate (paper)

	Paper	Δ
L	94.8	-0.2
a	-0.4	-0.4
b	-1.4	0.6
ΔE00	---	0.8
A	B	C
● 2.5	● 3.5	● 4.5

Show proof parameter

Hide digital parameter

Evaluation of digital print

Ok-Sheet Requirements Side-b...	Δ	A	B	C	Applicability media relative	Δ	A	B	C
Substrat difference ΔE00	0.8	● 2.5	● 3.5	● 4.5	White point difference ΔE00	0.8	● 6.5	● 8.5	● 11.5
All patches maximum ΔE00	4.9	● 6.5	● 7.5	● 8.5	Black point difference ΔL	4.3	✗ 3.5	● 10.5	● 15.5
All patches average ΔE00	0.9	● 2.5	● 3.5	● 4.5	Ok-Sheet Requirements Media...	Δ	A	B	C
C,M,Y,R,G,B maximum ΔHab	2.6	● 4.5	● 5.5	● 6.5	All patches average ΔE00	0.7	● 1.5	● 2.5	● 4.5
Near neutral average ΔCh	0.6	● 2.5	● 3.5	● 4.5	All patches 95% Percentile ΔE00	3.6	● 5.5	● 7.5	● 10.5
Extended Requirements Side-b...	Δ	A	B	C	Extended Requirements Media...	Δ	A	B	C
Gamut patches average ΔE00	0.9	● 3.5	● 5.5	● 7.5	Gamut patches average ΔE00	0.8	● 3.5	● 5.5	● 7.5
All patches average ΔE00	0.6	● 1.5	● 2.5	● 4.5	All patches average ΔE00	0.4	● 1.5	● 2.5	● 4.5
All patches 95% Percentile ΔE00	1.5	● 5.5	● 7.5	● 10.5	All patches 95% Percentile ΔE00	1.4	● 5.5	● 7.5	● 10.5

Show G7 parameter

New Open Measure Process parameters Save

File name: IT874randConv2RicoH901rel.cmyk2XYZ-ABSOLUTE+.txt <M0>

Standard: [CMYK] - Digital_2007WB **PS Norm Type: Digital** Printing Material: glossy coated

This part checks FOGRA MKV3 out of the testchart

Side-by-Side Media-Relative

This part checks the whole testchart

© Heidelberg Druckmaschinen AG

22



Color Tool: *PSD* – check: detailed: Substrate

Measure Compare Analysis Create Edit Process standard

Display of the substrate (paper) values

CIELAB color values (paper)

ΔE^*_{00}	1.1
Tolerances:	2.5 3.5 4.5
Lab:	94.9 -0.3 -0.9

$\Delta Ch^* = 1.1$

ΔE^*_{ab}	1.1
ΔL^*	-0.1
Δa^*	-0.3
Δb^*	1.1

New Open Measure Process parameters Save

File name: Ave-FOGRAMKV3_mid_M2.bt <M2>

ΔE_{00}



Color Tool: *PSD* – check: detailed: Color values

Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

ab diagram

Measure
Compare
Analysis
Create
Edit
Process standard

Display of the color values

CIELAB color values

<p>✗ ΔE^*_{00} 3.7</p> <p>Lab: 51.6 -34.3 -44.7</p>	<p>● ΔE^*_{00} 1.2</p> <p>Lab: 46.7 73.6 -3.1</p>	<p>● ΔE^*_{00} 0.7</p> <p>Lab: 88.4 -6.0 94.9</p>	<p>● ΔE^*_{00} 0.7</p> <p>Lab: 16.8 -0.3 0.2</p>
---	---	---	--

cyan

ΔE^*_{ab}	6.8
ΔL^*	-3.4
Δa^*	2.7
Δb^*	5.3

magenta

ΔE^*_{ab}	1.3
ΔL^*	-1.3
Δa^*	-0.4
Δb^*	-0.1

yellow

ΔE^*_{ab}	2.2
ΔL^*	-0.6
Δa^*	-1.0
Δb^*	1.9

black

ΔE^*_{ab}	0.8
ΔL^*	0.8
Δa^*	-0.3
Δb^*	0.2

<p>● ΔE^*_{00} 1.5</p> <p>Lab: 45.8 67.9 45.8</p>	<p>● ΔE^*_{00} 3.2</p> <p>Lab: 47.0 -60.8 25.5</p>	<p>● ΔE^*_{00} 1.7</p> <p>Lab: 22.1 19.2 -43.6</p>	<p>● ΔE^*_{00} 2.2</p> <p>Lab: 24.4 1.4 0.1</p>
---	--	--	---

red

ΔE^*_{ab}	2.5
ΔL^*	-1.2
Δa^*	-0.1
Δb^*	-2.2

green

ΔE^*_{ab}	5.4
ΔL^*	-3.0
Δa^*	4.2
Δb^*	-1.5

blue

ΔE^*_{ab}	4.1
ΔL^*	-1.9
Δa^*	-2.8
Δb^*	2.4

overprint

ΔE^*_{ab}	1.9
ΔL^*	1.4
Δa^*	1.4
Δb^*	0.1

New Open Measure Process parameters Save

● File name: Ave-FOGRAMKV3_mid_M2.bt <M2>

Standard: [CMYK] - Digital PSD_2007 PS Norm Type: Digital Printing Material: glossy coated



PSD: *Delivered digital standards*

➤ **Digital_PSD2007:** → actual offset-print standard ISO12647-2:2007

- Paper type PT1-2: glossy- (1) and matte-coated (2) paper
- Paper type PT4: uncoated white paper

➤ **Digital_PSD2013:** → new offset-print standard ISO 12647-2:2013

- Paper type PT1 = new substrate "PS1 = Premium coated".
- Paper type PT4 = new substrate "PS5 = Woodfree uncoated".

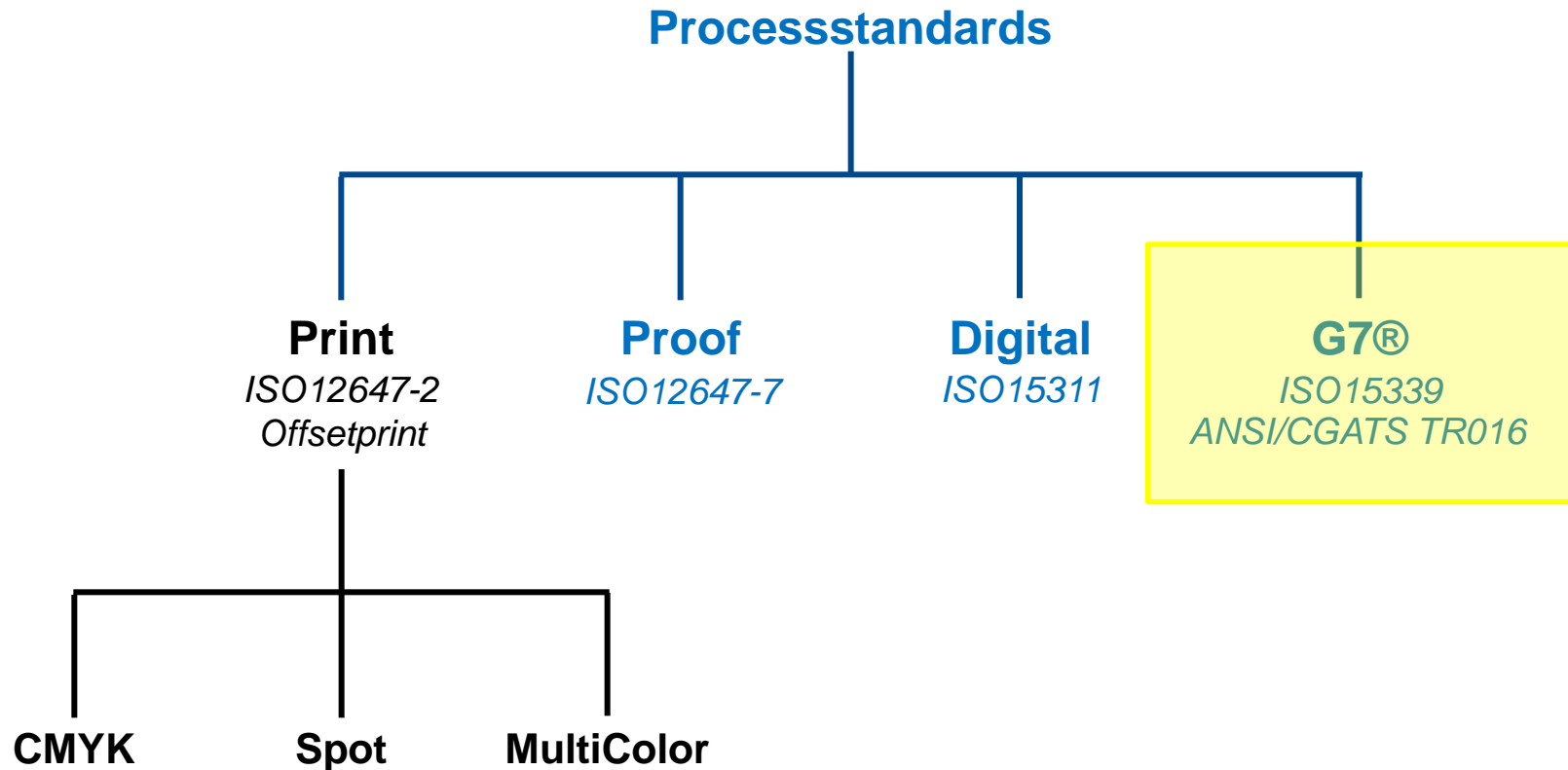
Processtandard	PapTyp	int Ref
Digital_PSD2007	1	FOGRA39L
	4	FOGRA47L
Digital_PSD2013	1	PC1_PremiumCoated_Beta
	4	PC5_WoodfreeUncoated_Beta



Processtandard GRACOL **G7: ISO 15339 (CGATS)**

- US-offset-printstandard

Color Tool: **New** Processstandard – Types: G7





Principles of process standards

G7: ANSI/CGATS TR016

- Gray Balance
- Color values primary/secondary
- Substrate (*informative*)
 - *dynamic adaptation of primary/secondary to substrate*

internal characterization-set
as reference **necessary**

Gray balance for
25%, 50% and 75%

ISO 12647-2 (BVDM/FOGRA)

- Color values primary/secondary
- Dotgain
- ~ Gray Balance
- Substrate (*informative*)
 - *absolute values*

No internal characterization-set
as reference

Gray balance for
30%, 50% and 70%

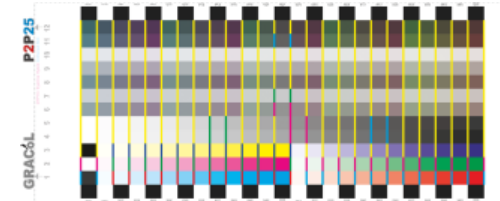


Color Tool: G7-Check (ISO15339): Used Elements

Minispots to be checked:

➤ *Standard-Check*

- P2P25
- FMS – G7 of HDM



- IDEAlliance Control Strip 2009
- IDEAlliance Control Strip 2013



➤ All other elements → **Warning**

Color Tool: *Select a G7-CGATS-process standard*



Übersicht

Verwaltung

Messen
Vergleichen
Analysieren
Generieren
Bearbeiten
Prozessstandard

Prozessstandard auswählen und bearbeiten

Standard: CGATS.21-2 CMYK Bedruckstoff: PT1 - glänzend gestrichen

PS Norm Type: G7 **Delta E Type:** Delta Eab **Density status:** ISO 5-3 Status E

CharacterizationDataSet: CGATS21-2-CRPC6_PT1.bt Internal reference file

Kommentar: Offset printing according to CGATS.21-2_CRPC6, Universal Premium Coated, white backing

▶ Tonwertdiagramm anzeigen

▶ Tonwerttabelle anzeigen

▶ Papierweiss anzeigen

▶ CIELab-Farbwerte und Dichten anzeigen

▶ Show Gray balance parameter

▼ G7 Parameter verbergen

ΔL CMY Patches		ΔL K Patches		ΔCh CMY Patches	
Weighted peak	<input type="text" value="3,00"/>	Weighted peak	<input type="text" value="3,00"/>	Weighted peak	<input type="text" value="3,00"/>
Weighted average	<input type="text" value="1,50"/>	Weighted average	<input type="text" value="1,50"/>	Weighted average	<input type="text" value="1,50"/>
HR (25/19/19)	<input type="text" value="2,00"/>	HR (25)	<input type="text" value="2,00"/>	HR (25/19/19)	<input type="text" value="3,00"/>
HC (50/40/40)	<input type="text" value="2,00"/>	HC (50)	<input type="text" value="2,00"/>	HC (50/40/40)	<input type="text" value="3,00"/>
SR (75/66/66)	<input type="text" value="2,00"/>	SR (75)	<input type="text" value="2,00"/>	SR (75/66/66)	<input type="text" value="3,00"/>

▶ Digital Parameter anzeigen

▶ Proof Parameter anzeigen

▶ Druckreihenfolge anzeigen

Bearbeiten

Sichern

Abbrechen

Löschen

Standard: [CMYK] - CGATS.21-2 **PS Norm Type: G7** Bedruckstoff: glänzend gestrichen



Color Tool: G7-Check: Standard check

Testform

Prozessstandard

Substrat

Farbwerte

Tonwertzunahme

Grauwerte

Farbzonen

Farbabfall

Messen Vergleichen Analysieren Generieren Bearbeiten Prozessstandard

Messdaten auf Prozessstandard überprüfen

● CIELAB-Farbwerte

ΔEab	0,8	1,4	1,1	1,0	1,0	2,6	2,9	0,3
------	-----	-----	-----	-----	-----	-----	-----	-----

ab-Diagramm

Substrate= paper white

✗ Substrat (Papier)

Pap...	Δ
L	95,4 0,4
a	-0,0 -1,0
b	-1,9 2,1
ΔEab	-- 2,3

Primary & secondary colors

▼ G7 Parameter verbergen

G7 Evaluation

NPDC Scale conformance

Eval CMY-Patches-ΔL*

ΔL CMY Patches	ΔL*	Max
Weighted peak	● 0,5	3,0
Weighted average	● 0,2	1,5
HR (25/19/19)	● 0,4	2,0
HC (50/40/40)	● 0,3	2,0
SR (75/66/66)	● 0,1	2,0

K-Patches-ΔL*

ΔL K Patches	ΔL*	Max
Weighted peak	● 0,4	3,0
Weighted average	● 0,2	1,5
HR (25)	● 0,1	2,0
HC (50)	● 0,1	2,0
SR (75)	● -0,3	2,0

Gray Balance

CMY-Patches-ΔCh*

ΔCh CMY Patches	ΔCh*	Max
Weighted peak	● 2,1	3,0
Weighted average	● 1,2	1,5
HR (25/19/19)	● 1,9	3,0
HC (50/40/40)	● 1,2	3,0
SR (75/66/66)	● 1,0	3,0

Check of control strip

Neu Öffnen Messen Prozessparameter Speichern

Dateiname: _P2P_Convert_from_profile.bt <MD>

Standard: [CMYK] - CGATS.21-2 **PS Norm Type: G7** Bedruckstoff: glänzend gestrichen

© Heidelberger Druckmaschinen AG

31

Color Tool: **G7**-Check: *New characterization data & PSO for G7-CGATS*



delivered in ColorTool:

2 data sets for coated and uncoated paper

- Paper type PT1 = substrate “universal premium coated”
- Paper type PT4 = substrate “universal premium uncoated”

Prozessstandard	PapTyp	int Ref
CGATS.21-2	1	CGATS21-2-CRPC6-PT1
	4	CGATS21-2-CRPC3-PT4



Profile Tool: *What's new?*

- Less GCR in skintones
 - GCR: Gray Component Replacement
 - CMY-percentage corresponding to gray replaced by K →*
 - less total area coverage*
 - ink saving & stable print
- Improved gamut clipping with relative rendering intent
 - less Magenta in Blue

GCR: less K in skin tones

colormetrically identical values (same Lab) **but**

→ reprotchnically skilled human eye:

impurity in GCR-built skin tones

hence Past: GCR not-accepted by repro

Actual: no GCR in fashion-shots & portraits

➤ **In a color sector of skin tones:**

Reduction of K+GCR in this sector →

✓ **skin tones and furniture (wood)**



GCR: less K in skin tones



The screenshot shows the Heidelberg Color Tool interface with the 'Profile Generation Setup' dialog box open. The 'GCR setting/Black generation' sub-dialog is also open, showing the 'GCR black generation' option selected. The 'Less GCR in skintones' checkbox is checked. The 'GCR value' slider is set to 70%. The 'Starting point K[%]' slider is set to 0%. The 'Black generation with length and width' option is unselected. The 'Black length' slider is set to 10, and the 'Black width' slider is set to 10. The 'Only in gray' checkbox is unselected. The 'OK' button is highlighted.

Profile Generation Setup

Print process parameters

Process/Technology: Ink Saving
 Paper class/Media: Wood-free coated
 Process colors/Profile type: CMYK 3 color CMY Gray

Color composition/Black generation

UCR setting: Total dot area: 260 %
 Maximum black: 98 %
 GCR setting: Custom

Profile calculation options

Gamut mapping: Default
 Paper white correction: Default
 Smoothing of measured values: Default

Profile parameters

GCR setting/Black generation

GCR black generation

Less GCR in skintones

GCR value: 70%
 Min. GCR: Max. GCR

Starting point K[%]: 0%
 0 40

Black generation with length and width

Black length: Starting point K[%]: 10
 9

Skeleton (min 2): Full range

Black width: 10
 Only in gray: Full extent

Patch:

ID:
 No.:
 x:
 y:
Ref. [%]
 CYAN =
 MAGENTA =
 YELLOW =
 BLACK =
Ref. [Lab]
 L =
 a =
 b =
Ref. [XYZ]
 X =
 Y =
 Z =
Spectrum
 No spectral values available for this patch

Density

C =
 M =
 Y =
 K =

File name: FOGRA39L.bt
 Profile name:

New Measurement Devices: Measurement modes M0 – M3

- TECHKON SpectroDens

- spot / scan



- X-Rite eXact

- spot



- Konica-Minolta FD7

- spot / strip
- IO (automatic table)



- X-Rite i1Pro 2

- spot / strip
- IO (automatic table)
 - spot / strip



M0 – M3

M0 – M2



Working with spot colors :

- *part* **Color Tool 2015**
- *main* **Color Tool 2016**

- ***Packaging***
- ***Digital Print***
- ***Offset (Anicolor)***

Working with spot colors



Spot Colors										
Multicolor										
Default										
Color Tables										
Name	CIE L*a*b			C	M	Y	K	S1	S2	S3
PANTONE 109 C	86.3	5.0	98.0	0	0	100	0	10	0	0
PANTONE 116 C	84.7	9.0	92.0	0	0	100	0	15	0	0
PANTONE 118 C	59.2	7.0	71.0	7	5	100	33	22	0	0
PANTONE 1225 C	85.1	12.0	67.0	0	0	74	0	21	0	0
PANTONE 137 C	75.7	32.0	84.0	0	0	88	0	46	0	0
PANTONE 138 C	62.7	36.0	80.0	4	0	100	13	63	0	0
PANTONE 145 C	58.8	31.0	68.0	11	0	89	19	62	0	0
PANTONE 1505 C	66.7	57.0	88.0	0	0	67	0	82	0	0
PANTONE 151 C	67.5	51.0	80.0	0	0	65	0	74	0	0
PANTONE 165 C	63.9	60.0	69.0	0	7	0	0	0	0	0
PANTONE 1788 C	53.3	73.0	45.0	0	70	0	0	0	0	0
PANTONE 182 C	82.4	25.0	3.0	0	21	0	0	14	0	0
PANTONE 185 C	49.4	76.0	43.0	0	85	0	0	73	0	0
PANTONE 186 C	43.9	68.0	38.0	5	90	0	8	76	0	0
PANTONE 2425 C	28.6	53.0	-19.0	0	100	5	23	0	0	46
PANTONE 2583 C	50.6	37.0	-35.0	0	49	0	0	0	0	56
PANTONE 2587 C	42.7	38.0	-45.0	0	43	0	0	0	0	73
PANTONE 2627 C	18.0	32.0	-34.0	0	63	16	32	0	0	94
PANTONE 272 C	52.5	14.0	-39.0	15	0	0	0	0	0	64
PANTONE 2766 C	14.5	11.0	-33.0	86	0	21	60	0	0	91
PANTONE 280 C	17.3	13.0	-52.0	100	0	8	36	0	0	82
PANTONE 282 C	12.2	1.0	-28.0	100	6	20	73	0	0	71



Difference due to:

- substrate
- production variance

Working with spot colors: *Measure into ColorTool 1*



The screenshot shows the ColorTool software interface. The 'Open' dialog box is open, displaying a list of files. The file 'User_Spot_PW.ref' is selected. The 'Color Toolbox - New measurement file' dialog box is also open, showing the 'Control strip' option selected. The 'User defined' option is chosen from the dropdown menu. The 'New' button in the main interface is highlighted.

Name (v)	Size	Type	Modified	Attributes
User6C_MB_100_80_40BCMYXZ.ref	2 KB	REF File	5/31/13 ...	
User7C_MB_100_80_40BCMYXZU.ref	3 KB	REF File	5/31/13 ...	
User_Defined.ref	1 KB	REF File	8/15/08	
User_Spot_PW.ref	1 KB	REF File	11/27/13...	
UserCS4_MB_100_80_40_20.ref	2 KB	REF File	1/26/11 ...	
UserDotgain_MC5_CMYK-B.ref	6 KB	REF File	1/17/13 ...	
UserDotgain_MC5_CMYK-G.ref	6 KB	REF File	1/17/13 ...	
UserDotgain_MC5_CMYK-R.ref	6 KB	REF File	1/17/13 ...	
UserDotgain_MC6_CMYK-GB.ref	7 KB	REF File	1/17/13	

Measurement of new test chart

Test chart

ISO 12642-2 / ANSI IT8.7/4

Control strip

User defined

Linearisation strip

PCM

Type: Standard

Reference data Edit Open

OK Cancel ?

New Open Measure Process parameters Save

File name: User_Spot_PW.ref

Files of type: Reference data (.ref)

Open Cancel

New spot-color-minispot:

consists of

- one spot color +
- paper-white: *under user-defined minispots*

Working with spot colors: *Measure into ColorTool 2*

The screenshot displays the Heidelberg ColorTool 2 software interface. The main window is titled 'Measure' and contains a 'Display of the test chart' area. A red dashed box highlights a portion of the test chart. A 'Measure' dialog box is open, showing the following settings:

- Measurement device setup:** TECHKON SpectroDens (spot) (dropdown), Connect button, Calibrate button.
- Color measurement:** CIE color values (checked), Density values (checked), Spectral values (checked).
- Measurement conditions:** D50 / 2 degree, ISO Status E.
- Filter:** none (M0:ISO-13655) (dropdown).
- Backing:** Black.
- Color patch measurement:** Single step measurement (unchecked), Start button.
- Check measured test chart values:** Check button.
- Save and Repeat chart measurement:** Start automatically (unchecked), Save button.

The 'Measure' button in the main window is highlighted with a blue box. The 'Measure' dialog box has a 'Close' button and a '?' button.

Working with spot colors: *Evaluate 1: Compare*



Measure Compare Analysis Create Edit Process standard

Display of the test chart

Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

ab diagram

Color calculator

Calculate color values Compare color

Decide which spot-color-table to use:

Table: PANTONE® solid coated

Name: 355 C

automatic search

Input	Table	Changes
L: 51.9	L: 53.5	ΔE*ab: 2.6
a: -66.7	a: -68.0	ΔE*90: 1.8
b: 36.5	b: 34.9	ΔL*: 1.6
		Δa*: -1.3
		Δb*: -1.6
		ΔH*: 2.0
		ΔC*: 0.4

Import from measure

OK Cancel ?

New Open Measure Process parameters Save

File name: User_Spot_PW-M0-WB-355.bt <M0>

Difference measured spot to spot-table-value

Working with spot colors: *Evaluate 1: Compare*



Measure Compare Analysis Create Edit Process standard

Display of the test chart

Test chart
Process standard
Substrate
Color values
Dot gain
Gray values
Ink zones
Gradual fading
ab diagram

Color calculator

Color calculator

Calculate color values Compare color

Table: PANTONE® solid coated
Name: 1485 C *manual input*

Input	Table	Changes
L: 75.1	L: 80.0	ΔE^*_{ab} : 8.3
a: 29.9	a: 27.7	ΔE^*_{50} : 4.0
b: 53.0	b: 46.7	ΔL^* : 4.9
		Δa^* : -2.2
		Δb^* : -6.3
		ΔH^* : -1.2
		ΔC^* : -6.6

Import from measure

OK Cancel ?

New Open Measure Process parameters Save

File name: User_Spot_PW-M0-WB-1485.bt <M0>

Difference measured spot to spot-table-value

Working with spot colors: *Evaluate 2a:*



Measure Compare Analysis Create Edit Process standard

Display of the test chart

Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

ab diagram

Color calculator

Calculate color values Compare color

Reference profile: ISOcoated_v2_eci.icc

Rendering Intent: Absolute colorimetric Black Point Compensation

Table: manually

Name:

Input	Output	Changes
Lab	C: 92.9	ΔE^*ab : 9.0
L: 51.9	M: 0.0	ΔE^*a_0 : 2.2
a: -66.7	Y: 100.0	ΔL^* : 0.4
b: 36.5	K: 0.0	Δa^* : 7.2
	S1: 0.0	Δb^* : -5.4
	S2: 0.0	ΔH^* : 1.3
	S3: 0.0	ΔC^* : -8.9
	S4: 0.0	

Import from measure

Include quantization effect

Close ?

OK Cancel ?

New Open Measure Process parameters Save

File name: User_Spot_PW-M0-WB-355.bt <M0>

1. Within gamut?

$$\Delta E_{00} < 1 \rightarrow \checkmark$$

2. How well to replace?

$$\Delta E_{00} <$$

a. 2

b. 3 or 4

c. 6

d. $\Delta E_{00} > 6$

Working with spot colors: *Evaluate 2b:*



Color calculator

Calculate color values Compare color

Reference profile: ISOcoated_v2_eci.icc

Color calculator

Calculate color values Compare color

Reference profile: Ave-7CLR_BVCGMOY-FM-621 21-M0-WB-330K98G50.icc MC

Rendering Intent: Absolute colorimetric Black Point Compensation

Table manually

Input	Output	Changes
Lab	C: 0.0	ΔE^*_{ab} : 1.2
L: 51.9	M: 3.6	ΔE^*_{50} : 0.6
a: -66.7	Y: 99.3	ΔL^* : 0.4
b: 36.5	K: 9.6	Δa^* : 0.5
	S1: 0.0	Δb^* : 1.0
	S2: 95.7	ΔH^* : -1.1
	S3: 0.0	ΔC^* : 0.1
	S4: 0.0	

File name: User_Spot_PW-M0-WB-355.bt <M0>

1. How well to replace?
 > Try other profile

Working with spot colors:

Processstability: Example 2:

Several colors and MultiColor [MC]



The screenshot shows the 'Measure' tab of the Heidelberg Color Tool. The interface includes a menu bar (Measure, Compare, Analysis, Create, Edit, Process standard), a left sidebar with options like 'Test chart', 'Process standard', 'Substrate', 'Color values', 'Dot gain', 'Gray values', 'Ink zones', 'Gradual fading', and 'ab diagram', and a main workspace. The workspace displays a 'Display of the test chart' with a row of color patches. Overlaid on this are four numbered steps in blue text:

1. Process to be used for spot or MC
2. Open a spot/MC-minispot
 - *ECI_GrayConM_i1 also available for 5-7color*
3. now 2 colors: *Orange and Green*
4. One defined from table other by measure

On the right side of the workspace, there is a 'Patch:' section with the following data:

```

Patch:
ID:
No.:
x:
y:
Ref. [%]
PANTONEGREENC =
PANTONEORANGE021C =
PANTONEVIOLETC =
BLACK =
CYAN =
MAGENTA =
YELLOW =
Ref. [Lab]
L =
a =
b =
Ref. [XYZ]
X =
Y =
Z =
Spectrum
No spectral values available for this patch
Density
C =
M =
Y =
K =
  
```

At the bottom of the workspace, there are buttons for 'New', 'Open', 'Measure', 'Process parameters', and 'Save'. The status bar at the very bottom shows the file name: 'File name: Ave-4Prof_NKcal3_1-IC2-2013_07_09T7col_Graycon_M_mix.txt <M2>'.

Working with spot colors: *Example 2:*

Define MC-processstandard spot 1



Measure Compare Analysis Create Edit **Process standard**

Select and edit process standard

Standard **MC6--Or21-PanGreen-FograWB** Multicolor Printing Material PT1 - glossy coated

PS Norm Type Offset Delta E Type Delta Eab Density status ISO 5-3 Status E

Internal Reference File Open

Comment FOGRA39 based on ISO 12647-2_2004Amd1, White Backing, glossy- and matte-coated PT1 and 2 and Spot 355 C

Hide dot gain curves

Dot gain preview

Process curve set
Curves from Calibration Manager (MDS)
Z_7C - glossy coated

Show dot gain values

Hide paper white

	L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*_{ab}
<input checked="" type="checkbox"/> Paper	95.00	0.00	-2.00	3.00	2.00	2.00	3.00

Hide CIELAB color values and density values

Name	L*	a*	b*	ΔE^*	ΔE^*_{ab} PV	ΔH^* PV	De
<input checked="" type="checkbox"/> cyan	55.00	-37.00	-50.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> magenta	48.00	74.00	-3.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> yellow	89.00	-5.00	93.00	5.00	5.00	3.00	
<input checked="" type="checkbox"/> black	16.00	0.00	0.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> Import from color tables	52.00	-67.00	37.00	5.00	4.00	3.00	
<input type="checkbox"/> magenta	50.00	-65.00	27.00	5.00	4.00	0.00	
<input type="checkbox"/> yellow	24.00	22.00	-46.00	5.00	4.00	0.00	

Import from color tables

1. Change standard name

2. Change PSO-type

3. Adapt comment

4. Change dot gain

5. Parametrize Color

a. Select option „Import from color table“

Import from color tables

Table PANTONE® solid coated

Name Yellow C **Type in spot name**

Import from color tables

Table PANTONE® solid coated

Name Orange 021 C

OK Cancel ?

Working with spot colors: *Example 2:*

Define MC-processstandard spot 2



Measure Compare Analysis Create Edit **Process standard**

Select and edit process standard

Standard MC6--Or21-PanGreen-FograWB Multicolor Printing Material PT1 - glossy coated

PS Norm Type Offset Delta E Type Delta Eab Density status ISO 5-3 Status E

Internal Reference File Open

Comment FOGRA39 based on ISO 12647-2_2004Amd1, White Backing, glossy- and matte-coated PT1 and 2 and Spot 355 C

Hide dot gain curves

Dot gain preview

Process curve set
Curves from Calibration Manager (MDS)
Z_7C - glossy coated

Show dot gain values

Hide paper white

Paper L* 95.00 a* 0.00 b* -2.00 ΔL^* 3.00 Δa^* 2.00 Δb^* 2.00 ΔE^*_{ab} 3.00

Hide CIELAB color values and density values

Name	L*	a*	b*	ΔE^*	$\Delta E_{ab}^* PV$	$\Delta H^* PV$	De
<input checked="" type="checkbox"/> cyan	55.00	-37.00	-50.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> magenta	48.00	74.00	-3.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> yellow	89.00	-5.00	93.00	5.00	5.00	3.00	
<input checked="" type="checkbox"/> black	16.00	0.00	0.00	5.00	4.00	3.00	
<input checked="" type="checkbox"/> Orange 021 C	62.23	63.55	86.18	5.00	4.00	3.00	
<input checked="" type="checkbox"/> Green C	57.61	-73.73	8.13	5.00	4.00	2.50	
<input type="checkbox"/> blue	24.00	22.00	-46.00	5.00	4.00	0.00	

Import Export Dry -> Wet

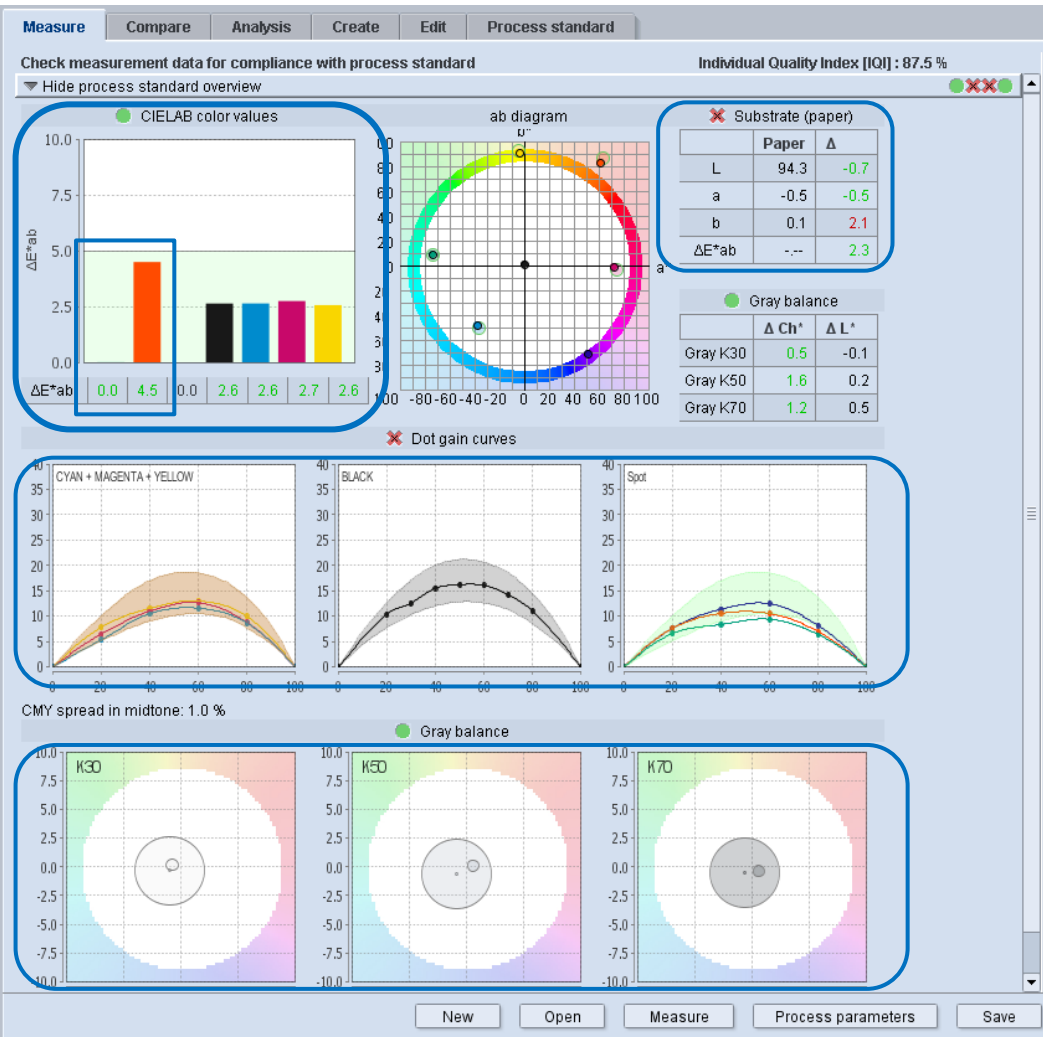
5. Parametrize Color

- Select option „Import from color table“
- Activate 7
- Select option „Import from measure“
- Rename spot

6. Save



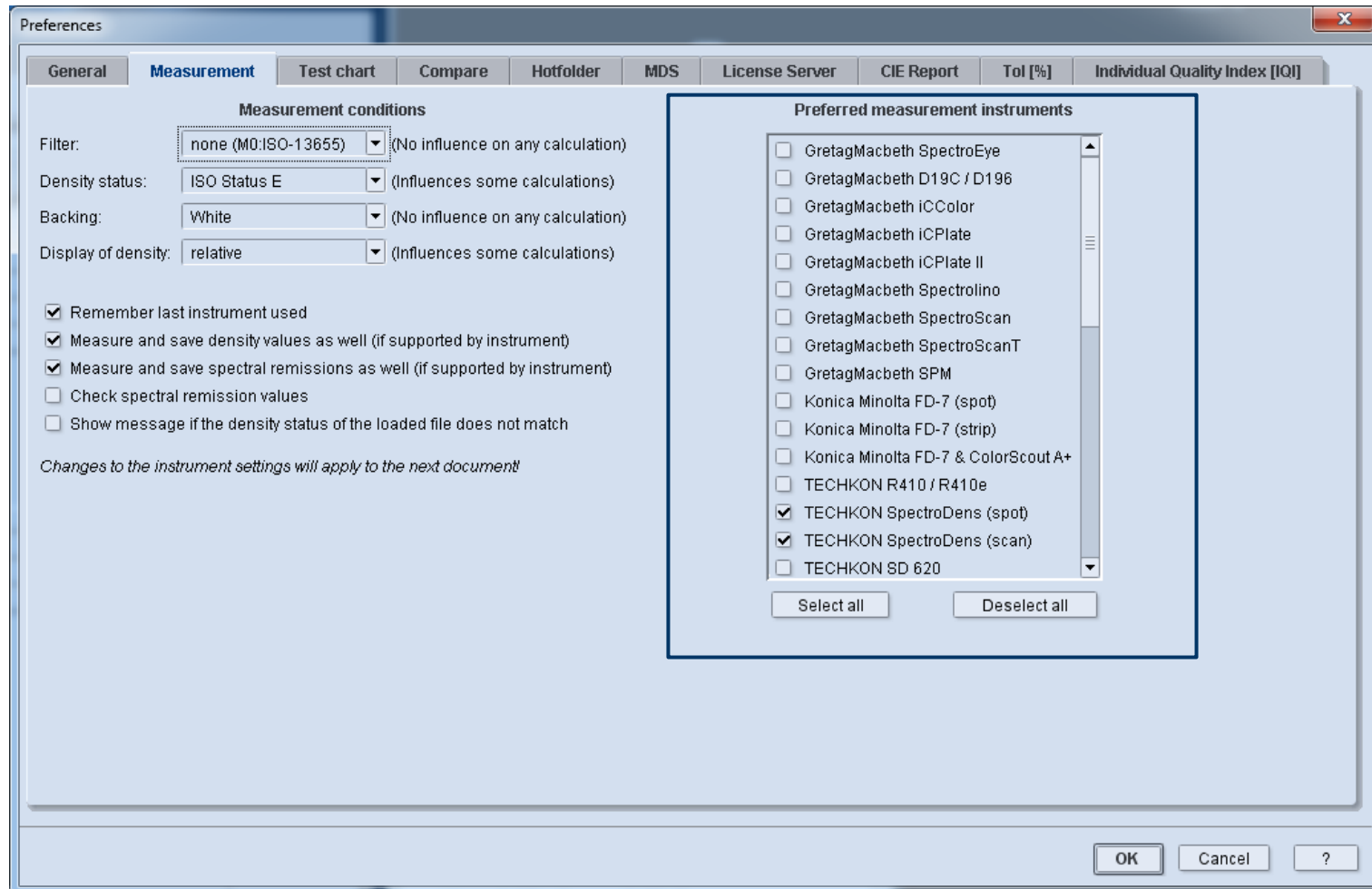
Working with spot colors: *Check process stability:* *Check against MC-processstandard*



File name: Ave-4Prof_NKaI3_1-IC2-2013_07_09T7col_Graycon_M_mix.bd <M2>

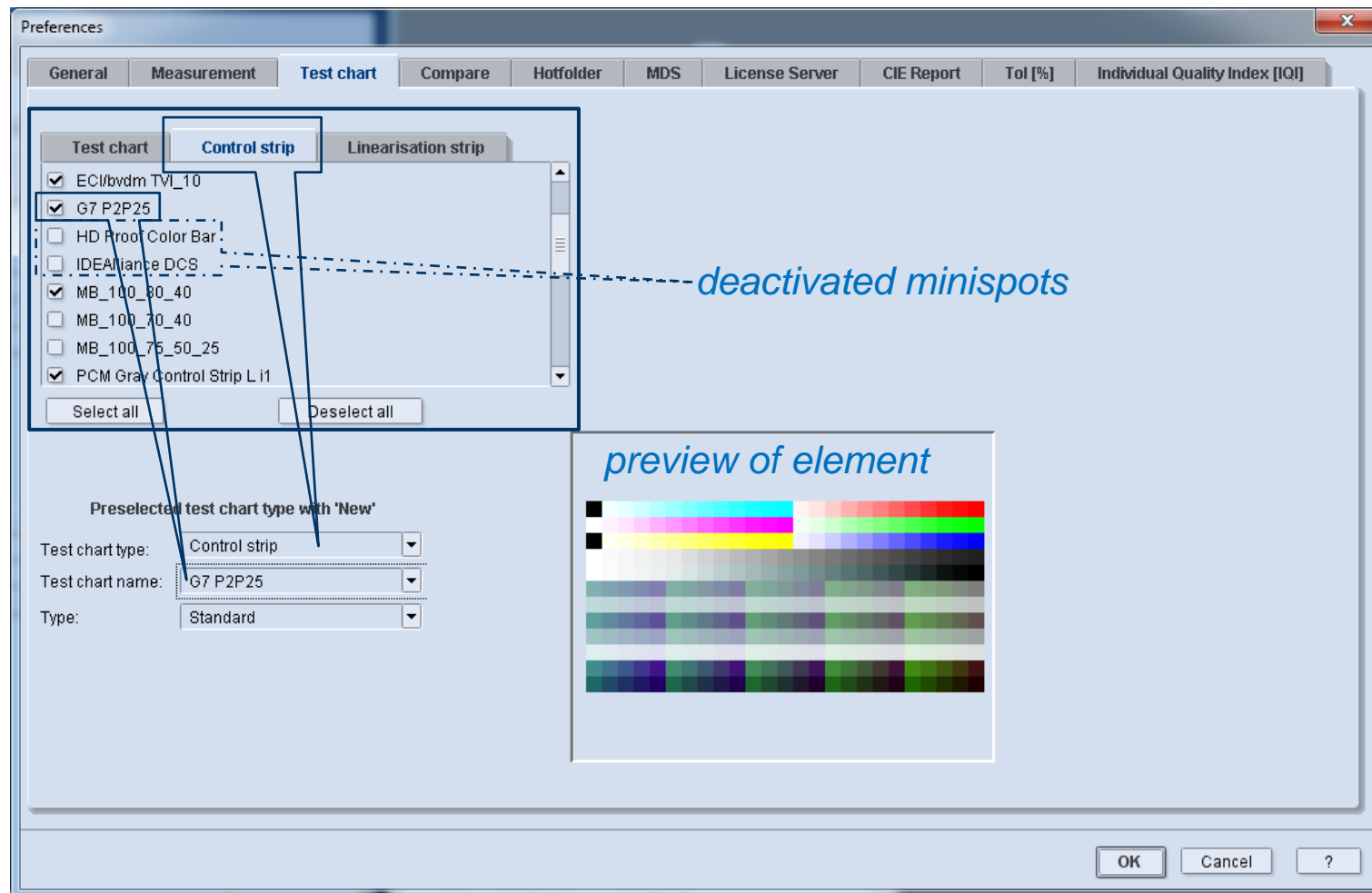
Standard: [Multicolor] - MC6--Or21-PanGreen-FograWB PS Norm Type: Offset Printing Material: glossy coated

Preferences-Measure: Manage measurement devices



- Preferences:Measurement: list with all measurement devices we support (initially all active)
- activate once your measurement device → only this device will appear in all functions
- additionally ColTool reminds the last used measurement device

Preferences-Measure: Manage elements (*testcharts, minispots, etc*)



- Preferences:Measurement: list with all test charts, minispots and linearisation strips we support (initially all active)
- activate once your used testcharts/minispots/lin-strips → only these will appear in all functions
- preview in the favorites-list

Color Tool: **EASE-OF-USE:** *What's new?*

- Drag & drop
- last recently used folders & files
- new Print architecture:
 - support short-key „Ctrl – P“ / „Strg – P“
 - „Ctrl+Shift-P“ → proof-report → Label-Printer
- open automatically the last measured file with measure-close
- Preferences-Measurement – Manage measurement devices
- Preferences-Measurement – Manage test charts/minispots/lin-strips
- Export process-standard

Default processstandards:

Measure Compare Analysis Create Edit Process standard

Overview Administration

Select and edit process standard

- Process standard
 - [CMYK] - CGATS.21-2
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - Digital PSD_2007
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - Digital PSD_2012
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - ISO 12647-2_2007 FograWB
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - ISO 12647-2_2007 HDM_BB
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - ISO 12647-2_2007BB
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - ISO 12647-2_2007WB
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - ISO 12647-2_2008 FograWB NP
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - PSO ISO12647-2_2013
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - Proof 12647-2_2007
 - PT1 - glossy coated
 - PT4 - uncoated
 - [CMYK] - Proof ISO12647-2_2013
 - PT1 - glossy coated
 - PT4 - uncoated
 - [Multicolor] - MC-7c_O21PanGrViolet_DG13_PT1BVS_170_M2_dry_BB
 - PT1 - glossy coated
 - [Spot colors] - 5C_ISO 12647-2_2007BB_Beige
 - PT1 - glossy coated

- obsolete outdated PSO removed
 - 2004-PSO
 - HDM-WB *identical to FOGRA*
 - PT 3 (web) and 5 (uncoated-yellow)
- ✓ new PSO 21013 added
- ✓ new standard-types added
- ✓ 1 spot- and MC-PSO added (example)

Working with spot colors: *Process stability:* *Define spot-processstandard 1*



White Backing
→ ISO 12647-2 FOGRA WB

Measure Compare Analysis Create Edit Process standard

Select and edit process standard

Standard Spot 355C -ISO FograWB Spot colors Printing Material PT1 - glossy coated

PS Norm Type Offset Delta E Type Delta Eab Density status ISO 5-3 Status E

Internal Reference File Open

Comment FOGRA39 based on ISO 12647-2_2004Amd1, White Backing, glossy- and matte-coated PT1 and 2 and Spot 355 C

Hide dot gain curves

Dot gain preview

Process curve set
Curves from Calibration Manager (MDS)
Z_7C - glossy coated

Show dot gain values

Hide paper white

	L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*ab
<input checked="" type="checkbox"/> Paper	95.00	0.00	-2.00	3.00	2.00	2.00	3.00

Hide CIELAB color values and density values

Name	L*	a*	b*	ΔE^*	$\Delta Eab^* PV$	$\Delta H^* PV$
<input checked="" type="checkbox"/> cyan	55.00	-37.00	-50.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> magenta	48.00	74.00	-3.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> yellow	89.00	-5.00	93.00	5.00	5.00	3.00
<input checked="" type="checkbox"/> black	16.00	0.00	0.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> red	47.00	68.00	48.00	5.00	4.00	0.00
<input type="checkbox"/> yellow	51.89	-66.70	36.53	5.00	4.00	3.00
<input type="checkbox"/> black	24.00	22.00	-46.00	5.00	4.00	0.00
<input type="checkbox"/> red	23.00	0.00	0.00	5.00	4.00	0.00
<input type="checkbox"/> green						
<input type="checkbox"/> blue						

Show overprint

Import from measure Import from color ta

Import Export Dry -> Wet

1. Change standard name
2. Change PSO-type
3. Adapt comment
4. Change dot gain
5. Parametrize Color
 - a. Deactivate 6-8
 - b. Select option „Import from measure“

Working with spot colors: *Processstability:* *Define spot-processstandard 2*



Measure Compare Analysis Create Edit **Process standard**

Select and edit process standard

Standard Spot colors Printing Material

PS Norm Type Delta E Type Density status

Internal Reference File Open

Comment

Hide dot gain curves

Dot gain preview

Process curve set
Curves from Calibration Manager (MDS)

Show dot gain values

Hide paper white

	L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*_{ab}
<input checked="" type="checkbox"/> Paper	95.00	0.00	-2.00	3.00	2.00	2.00	3.00

Hide CIELAB color values and density values

Name	L*	a*	b*	ΔE^*	ΔE^*_{ab} PV	ΔH^* PV
<input checked="" type="checkbox"/> cyan	55.00	-37.00	-50.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> magenta	48.00	74.00	-3.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> yellow	89.00	-5.00	93.00	5.00	5.00	3.00
<input checked="" type="checkbox"/> black	16.00	0.00	0.00	5.00	4.00	3.00
<input checked="" type="checkbox"/> 355 C	51.89	-66.70	36.53	5.00	4.00	3.00
<input type="checkbox"/> green	50.00	-65.00	27.00	5.00	4.00	0.00
<input type="checkbox"/> blue	24.00	22.00	-46.00	5.00	4.00	0.00
<input type="checkbox"/> overprint	23.00	0.00	0.00	5.00	4.00	0.00

Show gray balance parameters

Import Export Dry -> Wet

1. Change standard name
2. Change PSO-type
3. Adapt comment
4. Change dot gain
5. Parametrize Color
 - a. Deactivate 6-8
 - b. Select option „Import from measure“
 - c. Rename spot
6. Save



Working with spot colors: *Check process stability:* *Check against spot-processstandard*

Measure Compare Analysis Create Edit Process standard

Check measurement data for compliance with process standard Individual Quality Index [IQI] : 37.5 %

Hide process standard overview

● CIELAB color values

ab diagram

Substrate (paper)		
Paper	Δ	
L	96.9	1.9
a	0.8	0.8
b	-4.0	-2.0
ΔE^*ab	---	2.9

Gray balance

	ΔCh^*	ΔL^*
Gray K30		
Gray K50		
Gray K70		

ΔE^*ab 0.0 0.0 0.0 0.0 0.6

Dot gain curves

CYAN + MAGENTA + YELLOW

BLACK

Spot

CMY spread in midtone: Not measured

Gray balance

New Open Measure Process parameters Save

● File name: User_Spot_PW-M0-WB-355.txt <M0>

Standard: [Spot colors] - Spot 355C-ISO FograWB **PS Norm Type:** Offset **Printing Material:** glossy coated



INTERNATIONAL
PRINECT USER DAYS

8th and 9th October 2014

5. International Princt User Days, October 8th and 9th, 2014

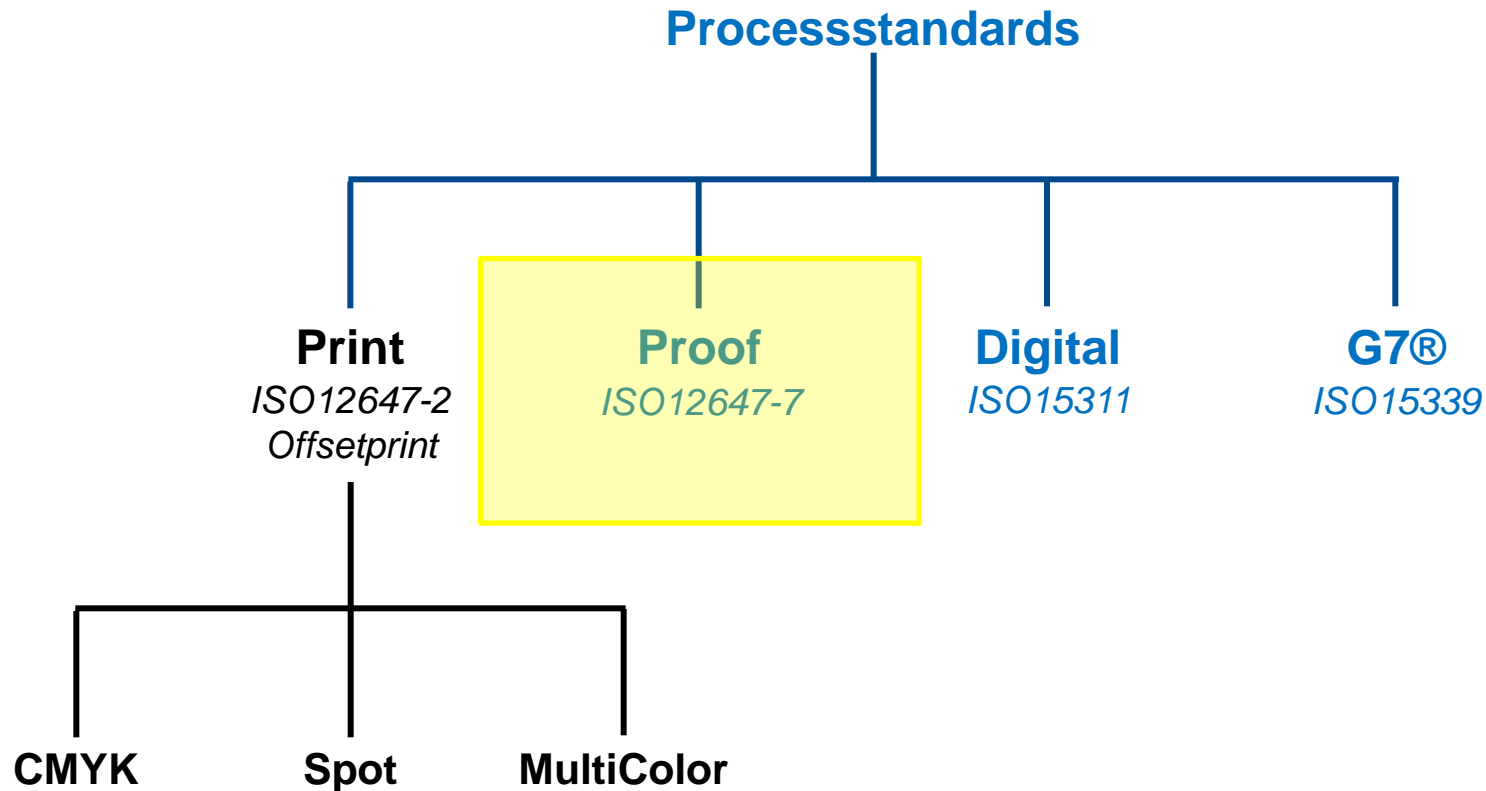
Thank you for your attention!

HEIDELBERG



Processtandard **Proof**: ISO 12647-7

Color Tool: **New** **Processtandard** – Types: Proof



Old Proof – check in Compare: ISO 12647-7



Color Toolbox 12.0

File View Special ? Color Toolbox

Measure Compare Analysis Create Edit Process standard

Display of the proof report

	$\Delta E(ab)$	State	Maximum	Patch no.
Paper:	0.09	● OK	3.00	C21
Mean	0.07	● OK	3.00	
Maximum	0.63	● OK	6.00	A18
Primary colors (max)	0.08	● OK	5.00	
Maximum ΔH primary colors	0.08	● OK	2.50	
Mean ΔH CMY gray	0.01	● OK	1.50	
Black	0.00	● OK	5.00	A21
Cyan	0.02	● OK	5.00	A1
Magenta	0.08	● OK	5.00	A6
Yellow	0.04	● OK	5.00	A11
Red	0.09	● OK	6.00	B6
Green	0.08	● OK	6.00	B11
Blue	0.18	● OK	6.00	B1

Test chart

xy diagram

ab diagram

La/Lb diagram

3D color space

Statistics

CIE report

Proof report

Proof statistics

ΔLab report

ΔLCH report

Tonal values

Data table

Color Tool: **Proof-Check: ISO 12647-7**

- **Already partially and suboptimally implemented in limited form**
 - Tabs Measure and Compare: *too much dialogs & clicks*
 - Parametrization in Preferences: *proper only for one set, no settings possible*
 - *functions properly only for coated*
- Additionally an internal characterization-set as reference necessary:
 - Coated: FOGRA39L
 - Uncoated: FOGRA47L
 - *Actual: separate parametrization under Preferences: Compare for only one case*
- To be checked: **processstandard, substrate, color values**; no dotgain and gray-balance
- Consists of two checks
 - standard-check for minispots (*already implemented*)
 - extended-check for testcharts (setup, profile-generation, iteration, **new**)
 - Mean-value of all patches
 - Mean-value of saturated color-patches
 - deviation of 95% -percentile of all patches

Color Tool: Proof-Check (ISO12647-7): Used Elements

Minispots / testcharts to be checked:

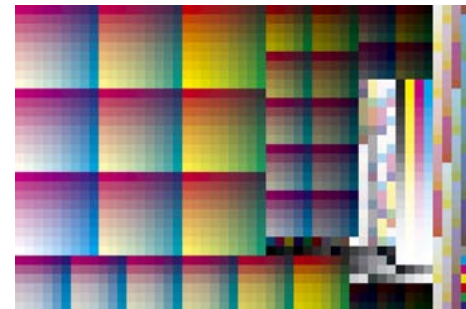
➤ *Standard-Check*

- **FOGRA MKV control-strip v3**
- IDEAlliance Control Strip 2009 (already supported; different name: „GRACOL-DCS“)
- IDEAlliance Control Strip 2013



➤ *Extended-Check: Testchart for setup & profiling*

- **Testcharts (ISO 12642-2) = IT8.7/4 + ECI2002**
 - visual + random



➤ All other elements → **Warning**

Color Tool: Proof-Check: Select a proof-process standard as reference

The screenshot displays the 'Process standard' configuration window in the Heidelberg Color Tool. Key elements include:

- Standard:** Proof 12647-2_2007
- CMYK:** (selected)
- Printing Material:** PT1 - glossy coated
- PS Norm Type:** Proof
- Delta E Type:** Delta Eab
- Density status:** ISO 5-3 Status E
- CharacterizationDataSet:** FOGRA39L.tst (highlighted as 'Internal reference file')
- Comment:** Proof according to ISO 12647-2_2007, Reference FOGRA39, White Backing, glossy coated PT1
- Proof sheet requirements:**

All patches average ΔE	3.00
All patches maximum ΔE	6.00
Maximum ΔE primary colors	5.00
Maximum ΔH primary colors	2.50
Mean ΔH CMY gray	1.50
- Extended requirements 12642-2:**

Gamut patches average ΔE	4.00
All patches average ΔE	4.00
All patches 95% Percentile ΔE	6.00

Navigation buttons (Import, Export, Dry -> Wet) are located at the bottom right. A status bar at the bottom shows: Standard: [CMYK] - Proof 12647-2_2007 PS Norm Type: Proof Printing Material: glossy coated.

Color Tool: Proof-Check: Standard check FOGRA MKV v3

Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

Measure Compare Analysis Create Edit Process standard

Check measurement data for compliance with process standard

▼ Hide process standard overview

● CIELAB color values

ΔEab 2.0 0.5 0.8 1.1 1.0 2.1 0.6 0.9

ab diagram

● Substrate (paper)

	Paper	Δ
L	95.2	0.2
a	0.0	0.0
b	-2.0	0.0
ΔEab	---	0.2

Substrate= paper white

▼ Hide proof parameter

Proof evaluation

Proof sheet requirements	ΔE(ab)	Maximum	Patch no.
All patches average ΔE	● 0.8	3.0	
All patches maximum ΔE	● 2.3	6.0	
Maximum ΔE primary colors	● 2.0	5.0	
Maximum ΔH primary colors	● 0.8	2.5	
Mean ΔH CMY gray	● 0.2	1.5	

Extended requirements 12642-2	ΔE(ab)	Maximum
Gamut patches average ΔE	---	6.0
All patches average ΔE	---	3.0
All patches 95% Percentile ΔE	---	4.0

▶ Show digital parameter

▶ Show G7 parameter

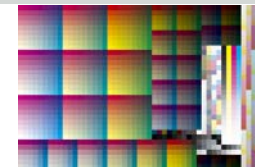
Further check of control strip

File name: Check-epson4800-heaven42.tst <M0>

Standard: [CMYK] - Proof 12642-2_2007 **PS Norm Type:** Proof **Printing Material:** glossy coated

NEW

Color Tool: Proof-Check: extended (IT8.7/4)



Test chart

Process standard

Substrate

Color values

Dot gain

Gray values

Ink zones

Gradual fading

Measure Compare Analysis Create Edit Process standard

Check measurement data for compliance with process standard

▼ Hide process standard overview

✗ CIELAB color values

ΔEab	1.9	1.4	2.7	2.3	3.3	3.4	6.4	6.3
------	-----	-----	-----	-----	-----	-----	-----	-----

ab diagram

● Substrate (paper)

Paper	Δ
L	95.0 -0.0
a	0.5 0.5
b	-1.6 0.4
ΔEab	-. 0.7

▼ Hide proof parameter

Proof evaluation

Proof sheet requirements	ΔE(ab)	Maximum	Patch no.
All patches average ΔE	● 2.4	3.0	
All patches maximum ΔE	✗ 7.1	6.0	
Maximum ΔE primary colors	● 2.7	5.0	
Maximum ΔH primary colors	● 1.3	2.5	
Mean ΔH CMY gray	● 1.5	1.5	

Extended requirements 12642-2

	ΔE(ab)	Maximum
Gamut patches average ΔE	● 2.4	6.0
All patches average ΔE	● 2.4	3.0
All patches 95% Percentile ΔE	✗ 5.3	4.0

▶ Show digital parameter

▶ Show G7 parameter

New
Open
Measure
Process parameters
Save

● File name: H64261_HP130_U400_K100_IsoCoated_Proof_lter1.txt <M0>

Standard: [CMYK] - Proof 12647-2_2007 **PS Norm Type: Proof** Printing Material: glossy coated

This part checks the intersection FOGRA MKV3 out of the testchart

This part checks the whole testchart

NEW

Proof-Check: *Delivered proof standards*

➤ **Proof_12647-2_2007**: proofs actual offset-print standard ISO12647-2:2007

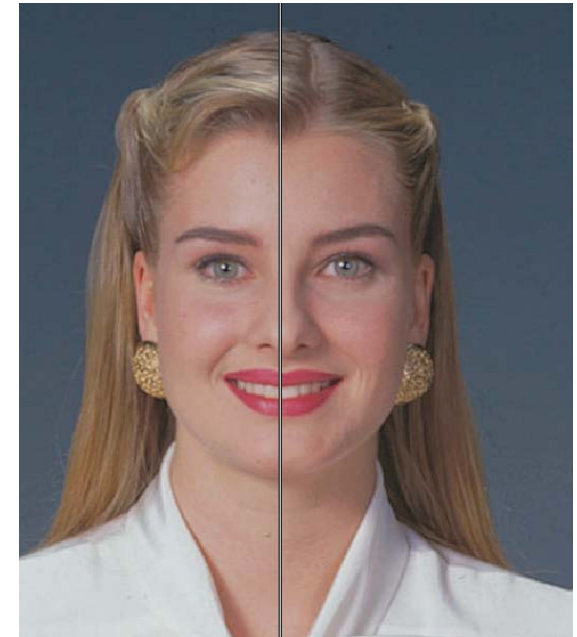
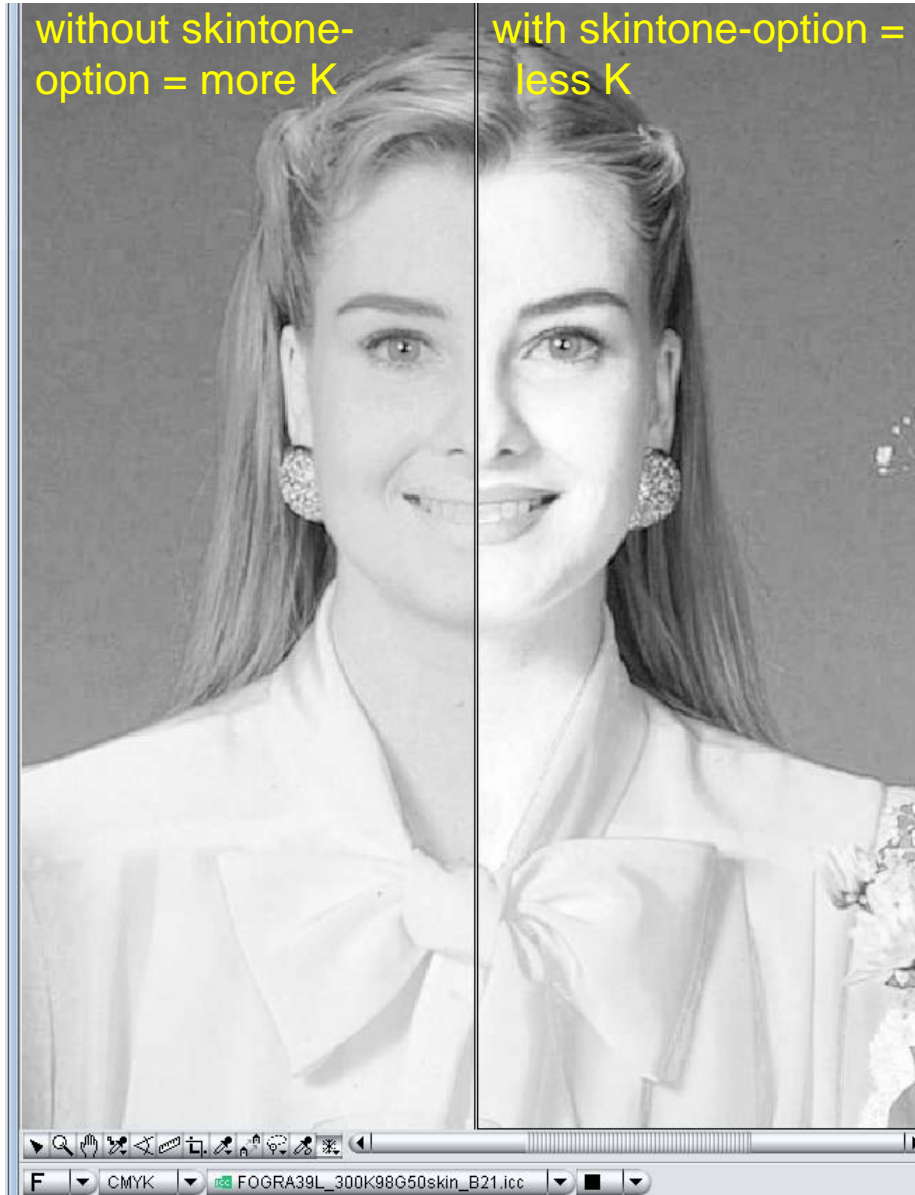
- Paper type PT1-2: glossy-coated (1) and matte-coated (2) paper
- Paper type PT4: uncoated white paper

➤ **Proof_ISO12647-2_2013**: proofs new offset-print standard ISO 12647-2:2013

- Paper type PT1: This corresponds to the new substrate "PS1 = Premium coated".
- Paper type PT4: This corresponds to the new substrate "PS5 = Woodfree uncoated".

Prozessstandard	PapTyp	int Ref
Proof_12647-2_2007	1	FOGRA39L
	4	FOGRA47L
Proof_12647-2_2012	1	PC1_PremiumCoated_Beta
	4	PC5_WoodfreeUncoated_Beta

GCR: less K in skintones



**In CMYK identical, but
in print more pure, since
less K in skin
GCR 50%**



GCR: less K in skintones



Create: actualized/revised profile parameter sets

Create – Profile parameters - Profile generation settings: default parameter sets outdated

Process	Paper	UCR total dot area	UCR max Black	UCR black length	UCR black width	GCR max
Digital Printing	Proof glossy	260	98			80
	Proof matt	260	98			80
	Proof semimatt	260	98			80
Offset Printing	Wood-free coated	330	95	9	10	
	Wood-free uncoated	300	98			50
	Light weight coated	300	98	10	10	
	Machine finished coated	280	98			50
	Super calendered	260	98	9	10	
	Newsprint	260	98	9	10	
Newspaper Printing	Standard newsprint	240	95			70
Gravure printing	Light weight coated Plus	360	85	25%	5	
	Light weight coated Std	360	85	25%	5	
	Super calendered Plus	360	85	25%	5	
	Super Calendered Std	360	85	25%	5	
	Machine Finished	375	80	3	5	
Proof	Proof glossy	400	100	6	8	
	Proof matt	400	100	6	8	
	Proof semimatt	400	100	6	8	
MultiColor Offset Printing	Wood-free coated	330	95			50
	Wood-free uncoated	300	95			50
Ink saving	Wood-free coated	280	98			70
	Wood-free uncoated	260	98			80