

Optical brighteners: From delight to dismay



UV-poor

UV-rich



Agenda

1. What is (was) the problem?
2. Important improvements
 1. ISO 12647-2
 2. New measurement devices (M1, as D50)
 3. New viewing cabinets (M1, as D50)
3. How to measure UV and OBA?
4. Communicating paper shades
5. When proofs match the prints
6. Transition from FOGRA39 to FOGRA51 - is the pain worth the gain?

1. Problem(s)

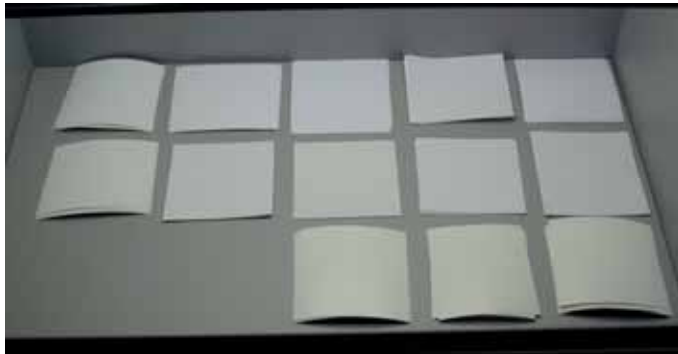
- Printing substrates uses a lot of optical brightener agents (OBA) ⇒
 - colour communication depends on D50 + UV-level
 - Differences in UV & OBA amount compromises consistent (predictable) colour appearance/communication
 - ISO 12647-2:2007 did not address typical paper categories



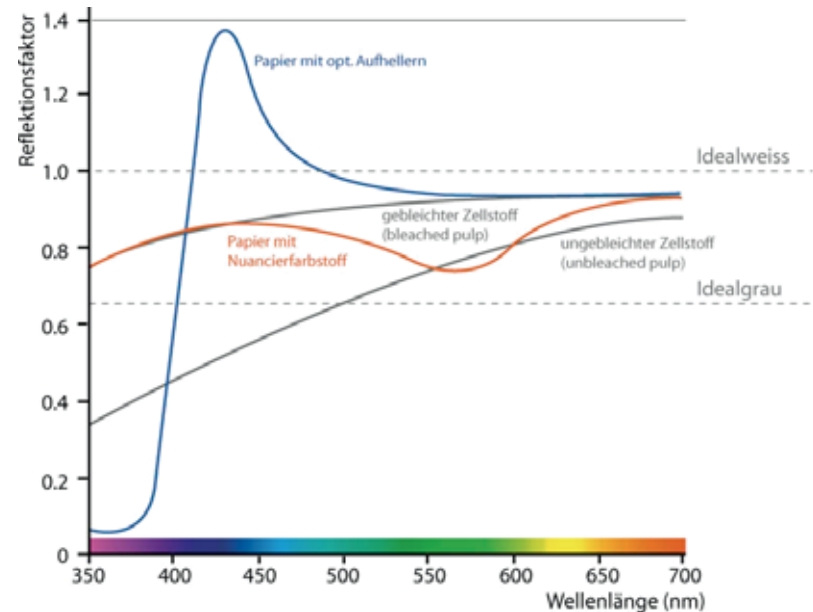
Why D50?
Read Fogra Extra 18

1. OBA friend or foe

Viewing cabinet - “D50”



Viewing cabinet - “UV-Only”



OBAs are used for decades in many industries

- to make teeth look whiter
- to make clothes look more shiny
- to differentiate paper shades and compensate for yellowish tint

1. Problem: Mixing old and new

- With the revised 3664 (2009) we get more UV in the light from the standard light bulbs, but before that UV was poorly present



old normlight from Just
old proof printing paper

1. Problem: Mixing old and new

- With the revised 3664 (2009) we get more UV in the light from the standard light bulbs, but only paper with OBA react



1. Problem: Mixing old and new

- With the revised 3664 (2009) we get more UV in the light from the standard light bulbs, and if proof and production stock shares similar levels of OBA..



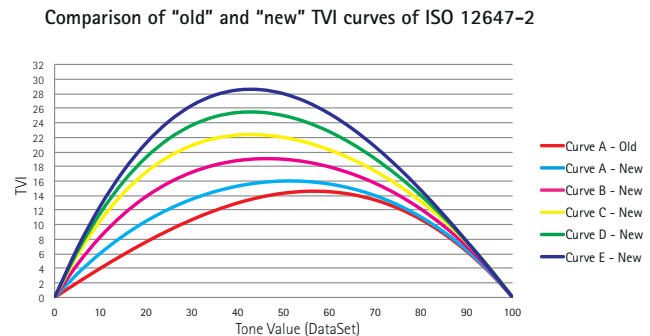
1. Problem: Mixing old and new

- With the revised 3664 (2009) we get more UV in the light from the standard light bulbs, and can see the problem in both ways ...



2.Important improvements I/III

- Revision of ISO 12647-2 (published 2013)
 - Film based workflows to CtP \Rightarrow new TVI curves
 - Rich substrate range \Rightarrow from 5 to 8 substrates
 - Clear provisions for implementations \Rightarrow M1 measurement mode & CIEDE2000
 - Grey balance formulae (each printing condition has it's own optimal operating window \Rightarrow grey balance)





2.Important improvements I/III

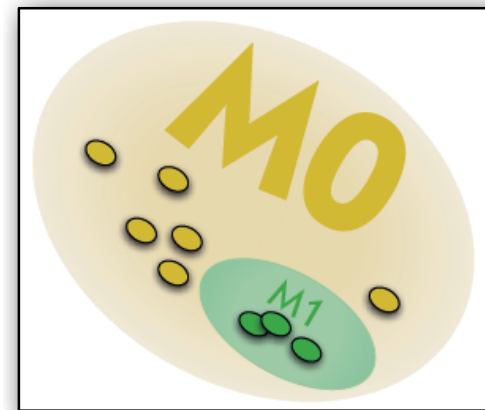
	Print Substrates (PS)			
	PS1	PS2	PS3	PS4
Type of surface	Premium coated	Improved coated	Standard coated glossy	Standard coated matte
Typical process	Sheet fed offset, Heat set web offset	Heat set web offset	Heat set web offset	Heat set web offset
Typical papers	Wood-free coated (WFC), High weight coated (HWC), Medium weight coated (MWC), glossy/semi-matte/matte	Medium weight coated (MWC) Light weight coated (LWC Improved)	Light weight coated (LWC), glossy/semi-matte	Machine finished coated (MFC), Light weight coated (LWC), semi-matte
	PS5	PS6	PS7	PS8
Type of surface	Wood-free uncoated	Super calendered	Improved uncoated	Standard uncoated
Typical process	Sheet fed offset, Heat set web offset	Heat set web offset	Heat set web offset	Heat set web offset
Typical papers	Wood-free uncoated (WFI)	Super calendered (SC-A, SC-B)	Uncoated mechanical improved (UMI), Improved newsprint (INP)	Standard newsprint (SNP)

Sheet Fed

Heat-Set (web fed)

2.Important improvements II/III

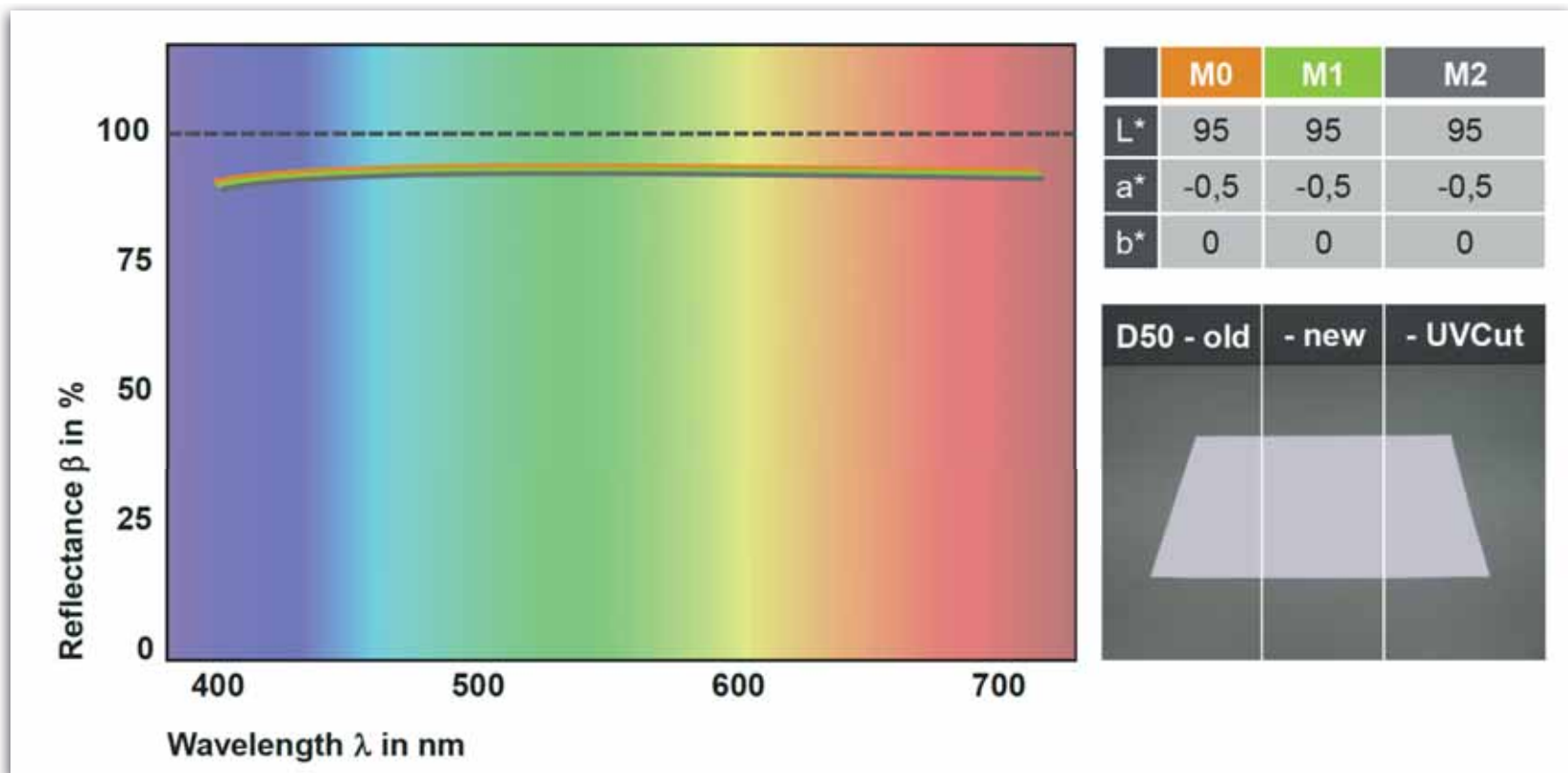
- Measurement condition M1 (ISO 13655:2009)
 - Simulates D50 much closer in the UV-range
 - Used measurement light source become more consistent among vendors
 - Current M1 capable handheld devices



Source: GMG

2.Important improvements II/III

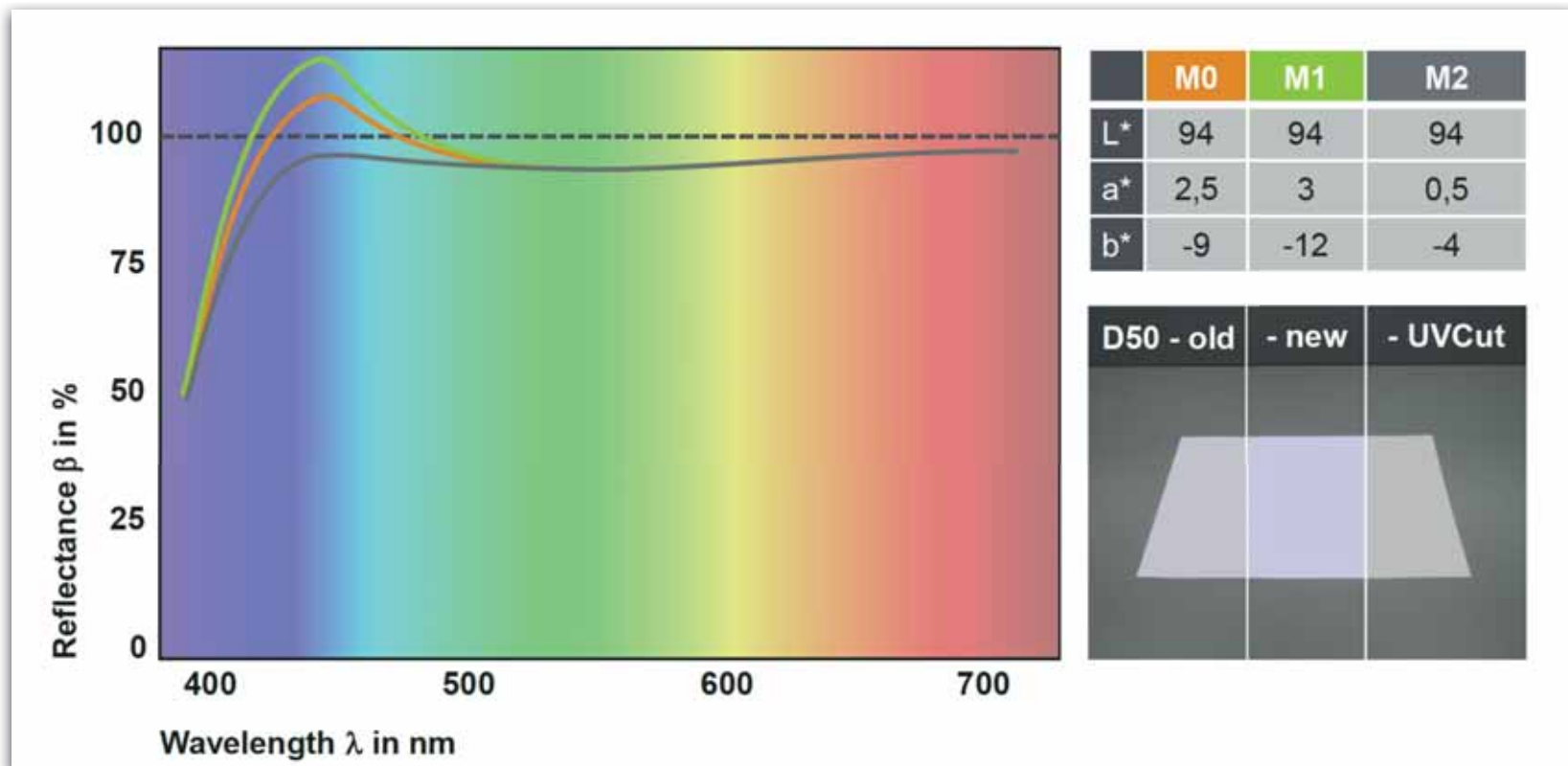
- If paper have no OBA, then measurement is easy



Quelle: Payson, XRite

2.Important improvements II/III

- As soon OBA's are on board, ...



Quelle: Payson, XRite

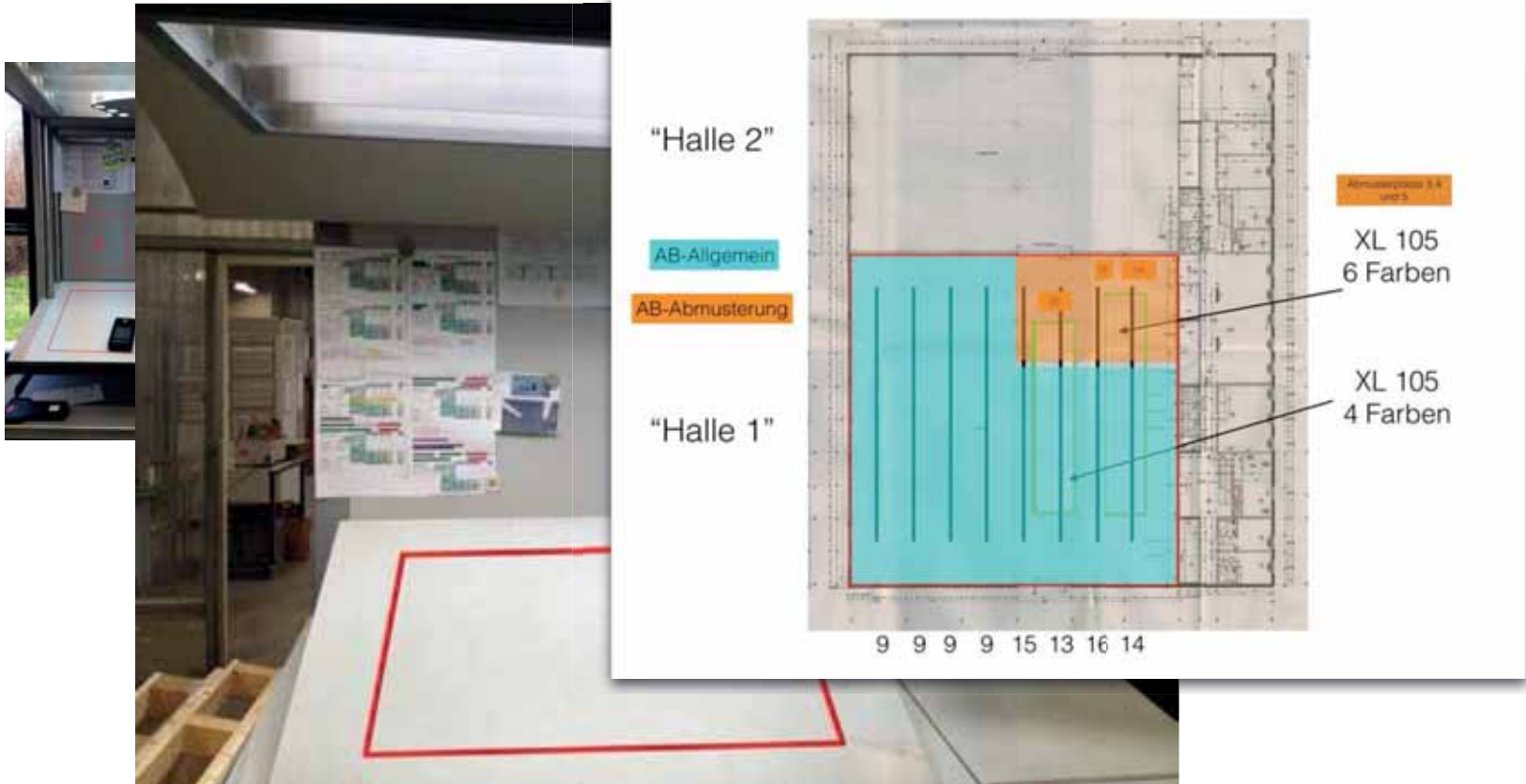
2.Important improvements III/III

- Measurement condition M1 (ISO 3664:2009)
 - Simulates D50 much closer in the UV-range
 - Used viewing cabinets light source become more consistent among vendors



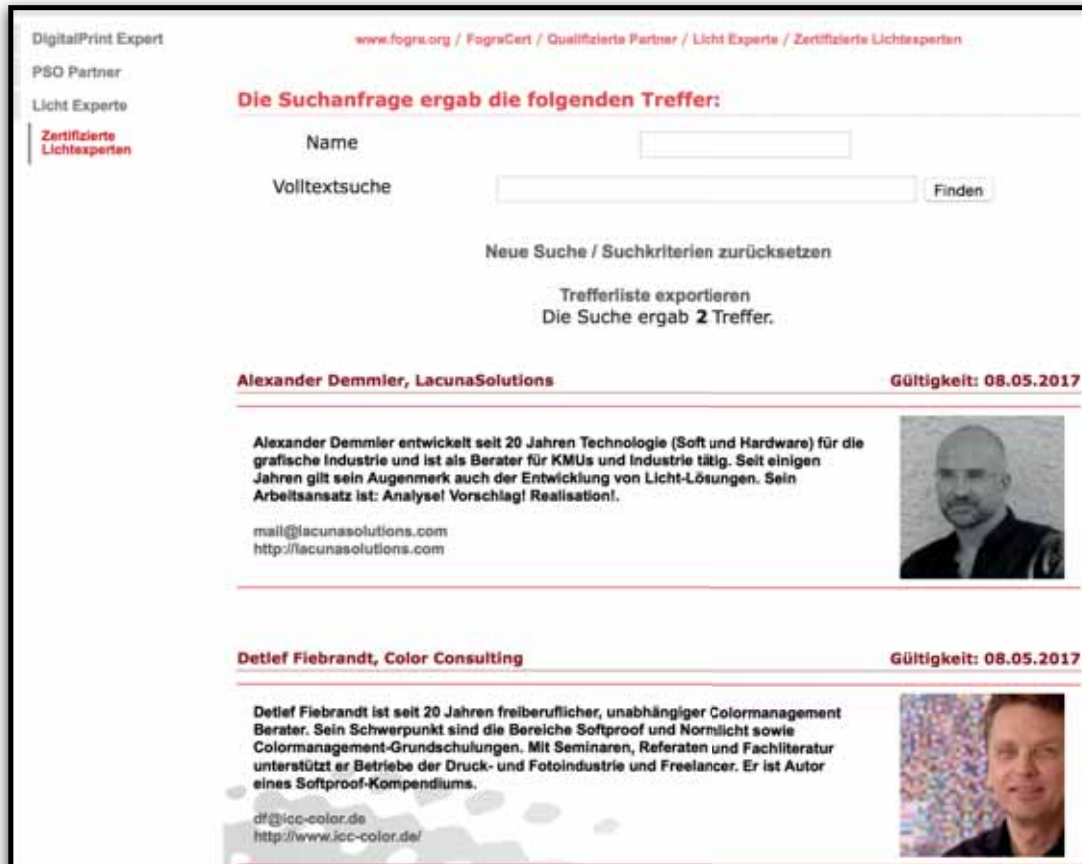
2.Important improvements III/III

- Fogra provides a professional light audit



2.Important improvements III/III

- supported by qualified partners




The screenshot shows a search results page on the Fogra website. The page is titled "Die Suchanfrage ergab die folgenden Treffer:" (The search query yielded the following hits:). It lists two qualified partners:

Alexander Demmler, LacunaSolutions Gültigkeit: 08.05.2017

Alexander Demmler entwickelt seit 20 Jahren Technologie (Soft und Hardware) für die grafische Industrie und ist als Berater für KMUs und Industrie tätig. Seit einigen Jahren gilt sein Augenmerk auch der Entwicklung von Licht-Lösungen. Sein Arbeitsansatz ist: Analyse! Vorschlag! Realisation!


mail@lacunasolutions.com
http://lacunasolutions.com



Detlef Fiebrandt, Color Consulting Gültigkeit: 08.05.2017

Detlef Fiebrandt ist seit 20 Jahren freiberuflicher, unabhängiger Colormangement Berater. Sein Schwerpunkt sind die Bereiche Softproof und Normlicht sowie Colormangement-Grundschulungen. Mit Seminaren, Referaten und Fachliteratur unterstützt er Betriebe der Druck- und Fotoindustrie und Freelancer. Er ist Autor eines Softproof-Kompodiums.

df@icc-color.de
http://www.icc-color.de/



3. How to measure UV?

A 69-year-old man presented with a 25-year history of gradual, asymptomatic thickening and wrinkling of the skin on the left side of his face. ...The patient reported that he had driven a delivery truck for 28 years. Ultraviolet A (UVA) rays transmit through window glass,

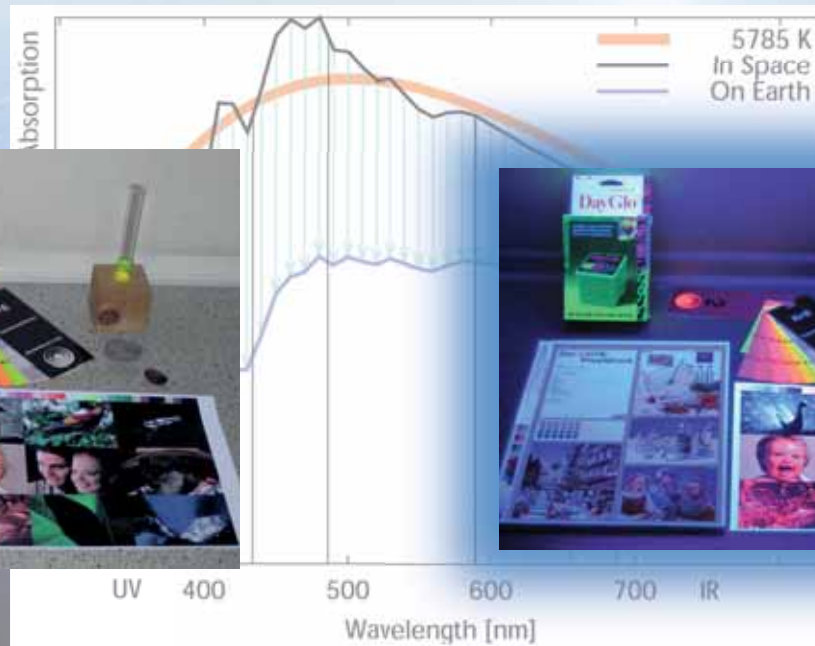


UV-poor

UV-rich

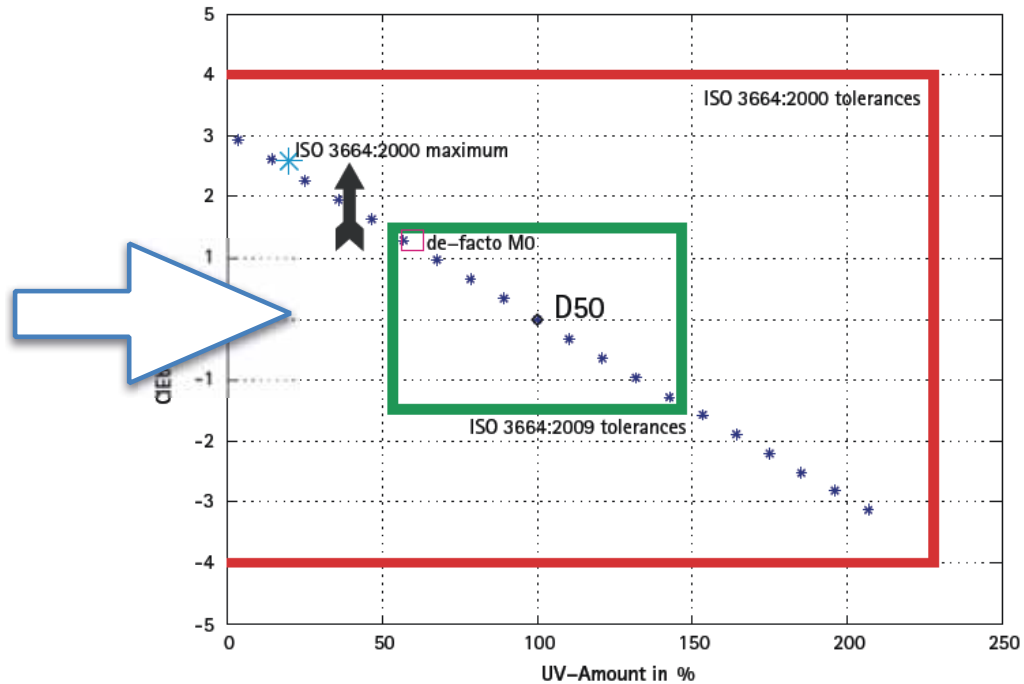
3. D50 with UV or not?

▶ The sun emits light with a temperature of almost 6000K

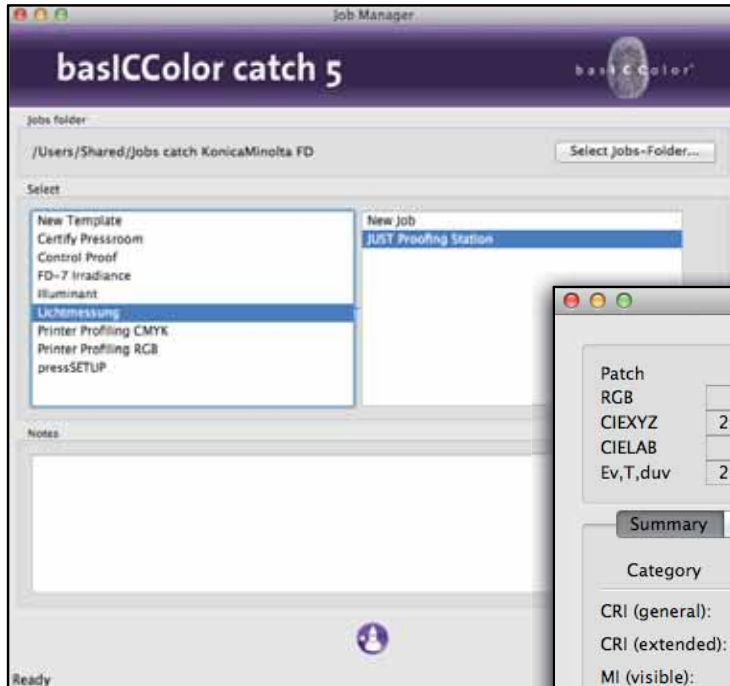


3. Fogra method: concept

- 1. Measure ambient light source
- 2. Use MS-Excel or software

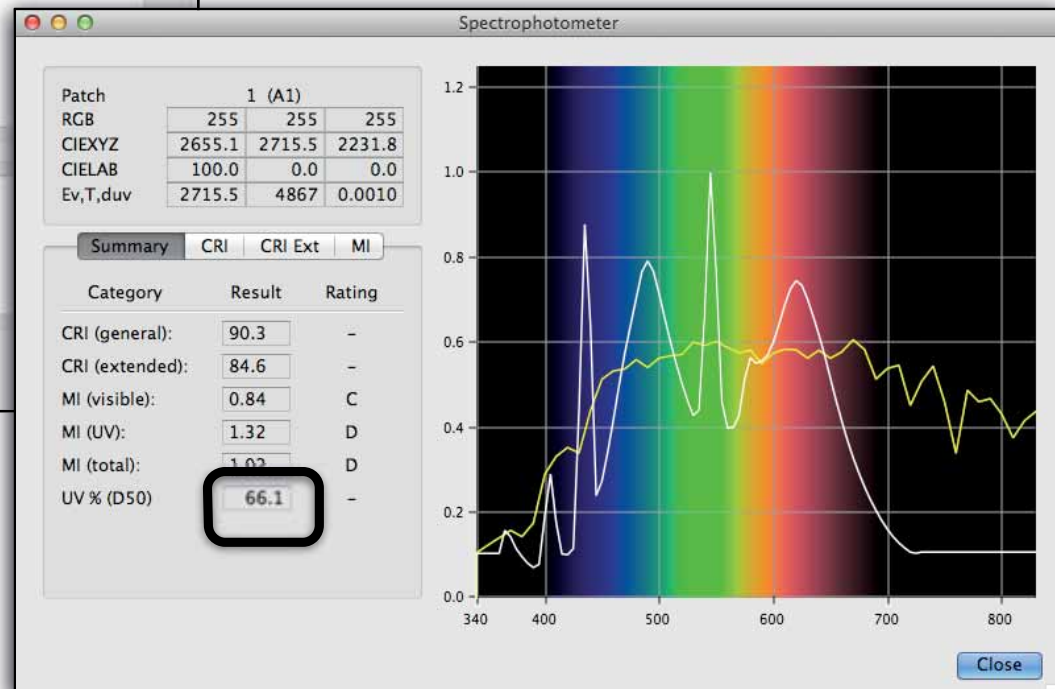


3. Fogra method: Use it!



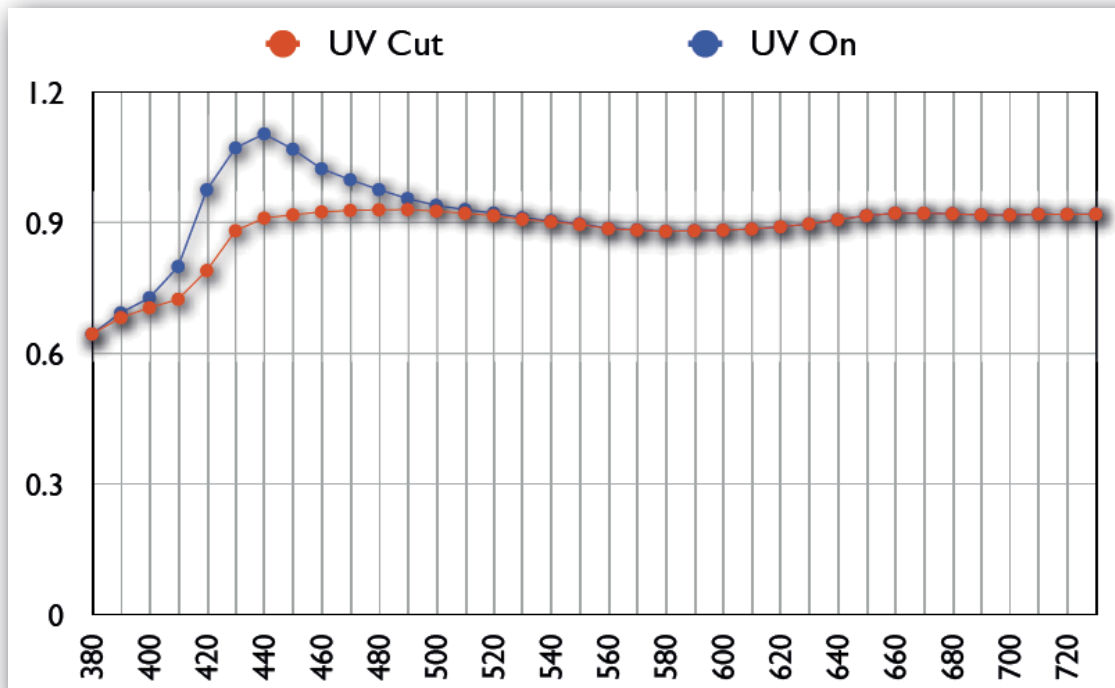
Light measured at Fogra lab

⇒ 66%



3. How to measure OBA?

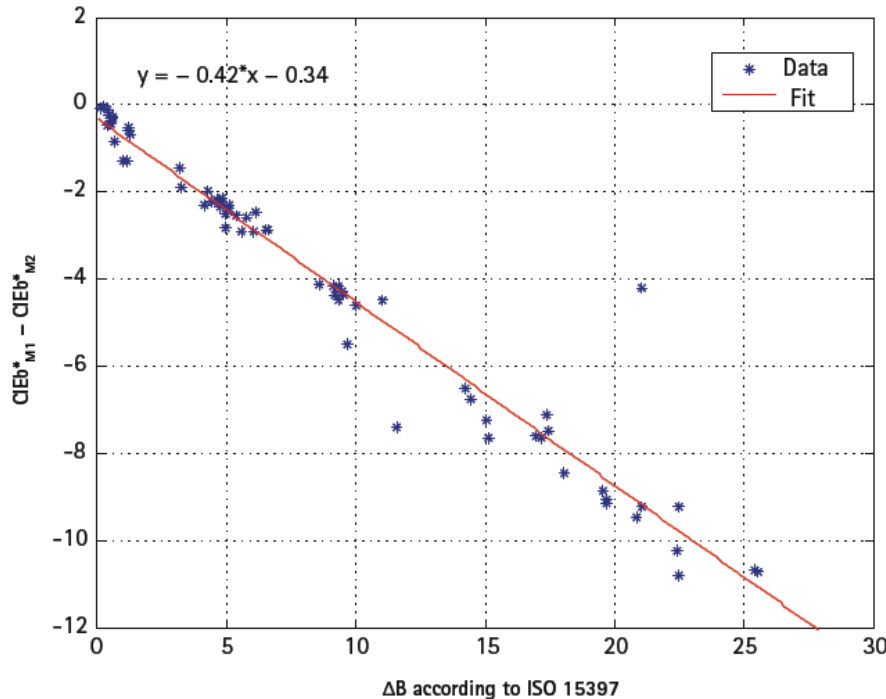
- Practical measure: White degree, Difference of the CIEb*-Values when measuring with and without UV excitation (ISO 13655:2009 M1 and M2)
- „ ΔB “, meaning the difference between ISO Brightness (ISO 2470-2) and ISO Brightness without UV excitation (UV-Cut at 410 nm)



ΔB	OBA amount
< 1	no OBA
≤ 4	faint
≤ 8	low
≤ 14	moderat
> 14	high

3. How to measure OBA?

- Use ΔB (when device supports it) or two colour measurements
- Either: M1 and M2 (new devices) or M0 and M2 (legacy devices)



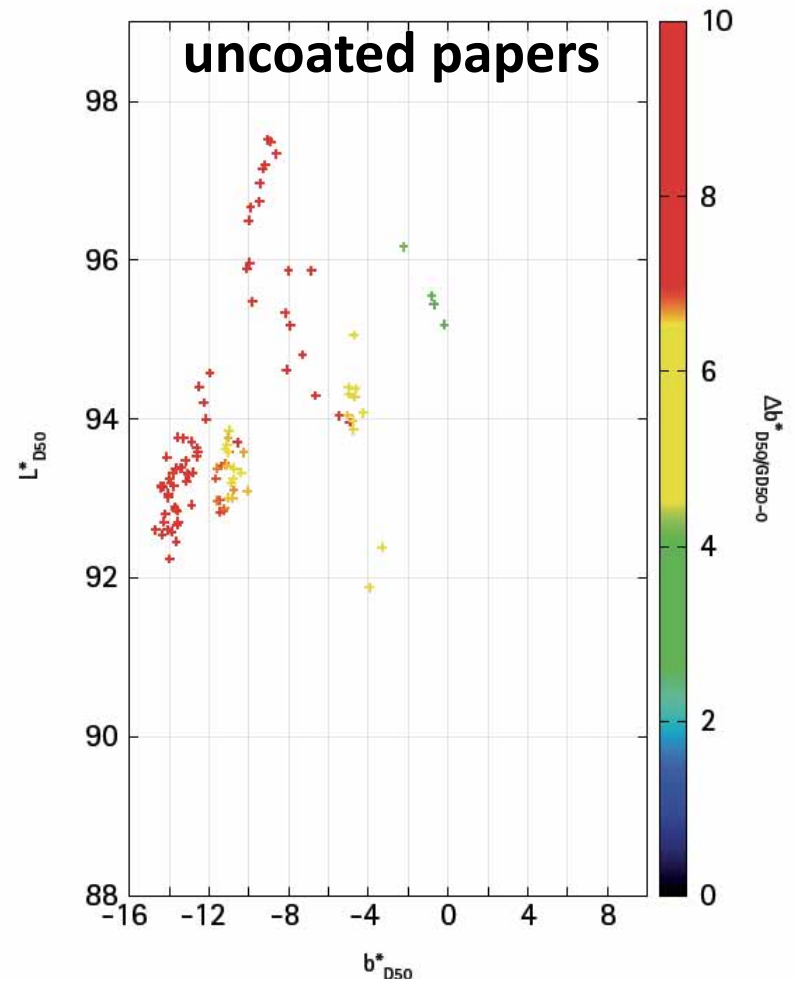
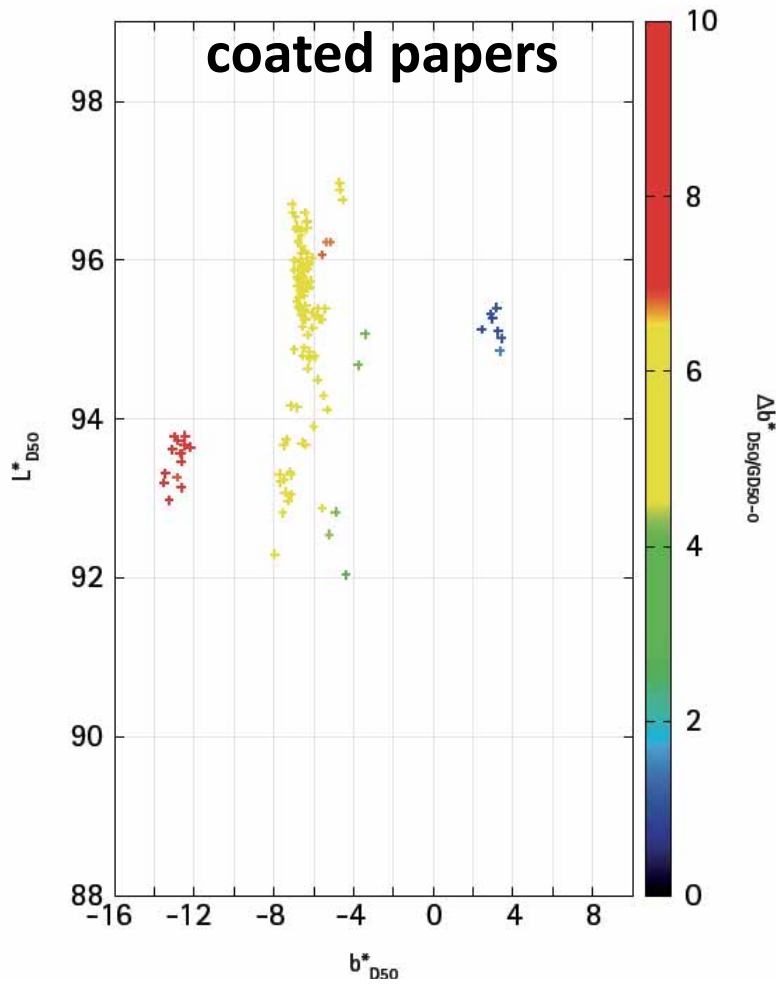
Example:

M1: 95 2,1 -8,1
 M2: 94 1,5 -1
 $\Delta CIEb^* = 7,1$
 $\Rightarrow \Delta B = 16$
 \Rightarrow High OBA amount

ΔB	0	2	4	6	8	10	12	14	16	18	20	22	24
$\Delta CIEb^*$	-0,3	-1,2	-2,0	-2,9	-3,7	-4,5	-5,4	-6,2	-7,1	-7,9	-8,7	-9,6	-10,4



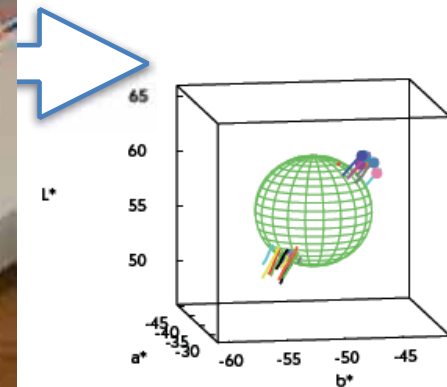
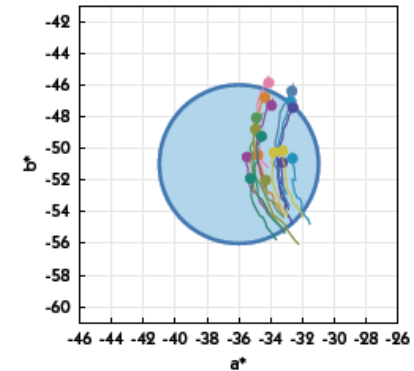
4. Communicating paper shades



Source: GMG

4. Communicating paper shades

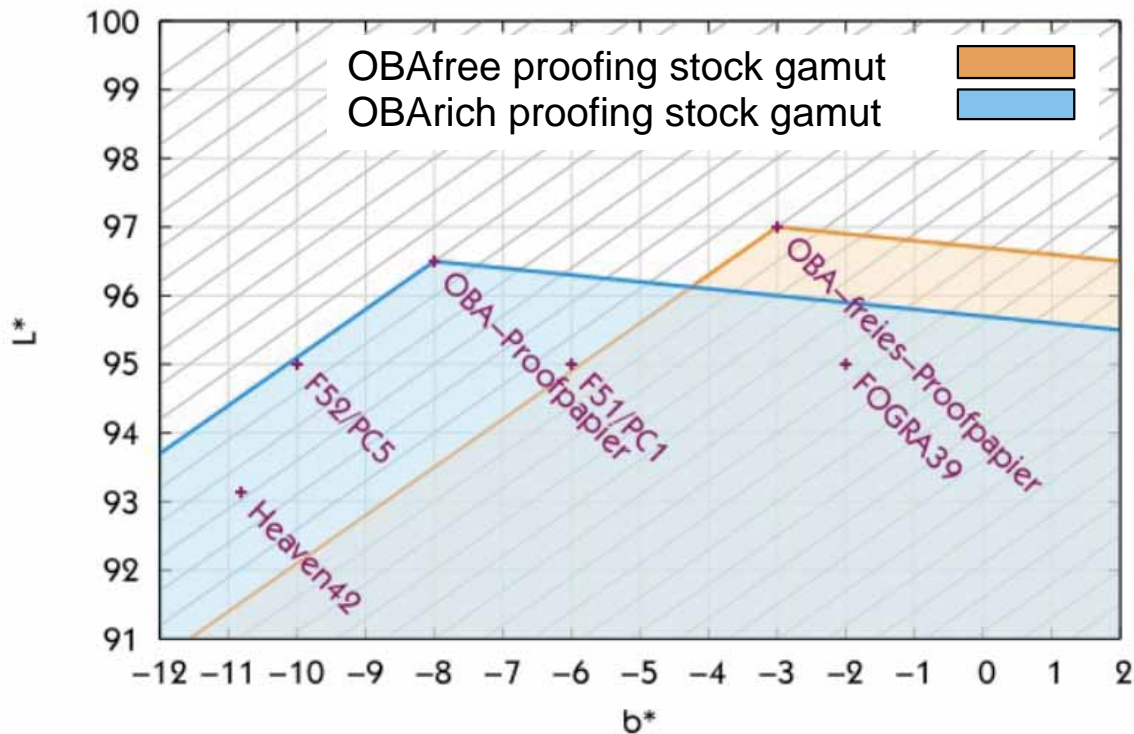
- M1 based instrument required for colour protocol of dry sheet
- Established measurement devices perfectly suited to correlate “wet to dry”



100% Cyan on 3 papers with 4 devices

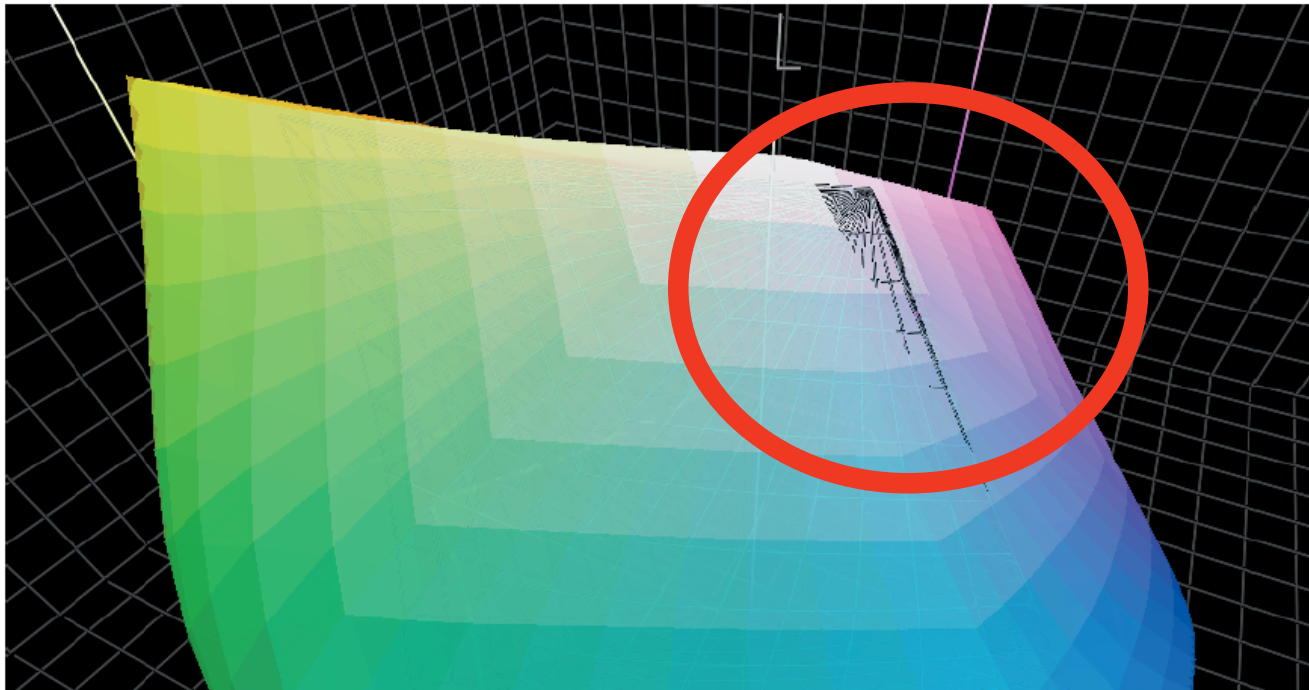
5. When proofs match the print

- OBARich papers exceed the gamut of OBAfree proofing paper
- Use the diagram to check out “proofability”



5. Measure as you see - works

- Gamut differences for proof matching
- Wire frame: OBArich coated stock
- Solid: OBA poor proofing stock (EPSON 9900)

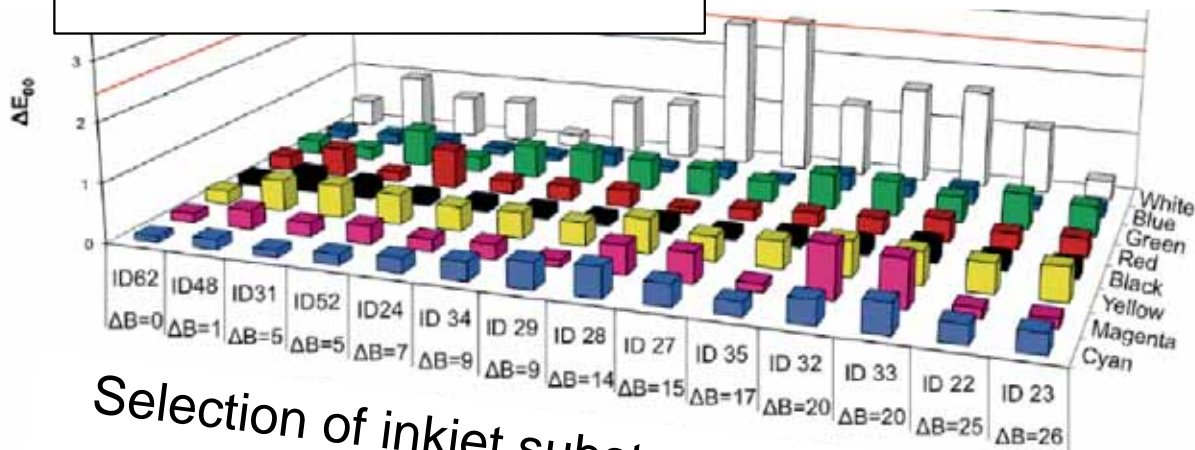


EP9900 on OBA free proofing stock versus Heaven42 (wire frame)

5. OBArich papers can be lightfast

- Inkjet prints with different OBA level \Rightarrow suntester
- There are light fast proofing papers with high OBA levels

24h exposure (solids)



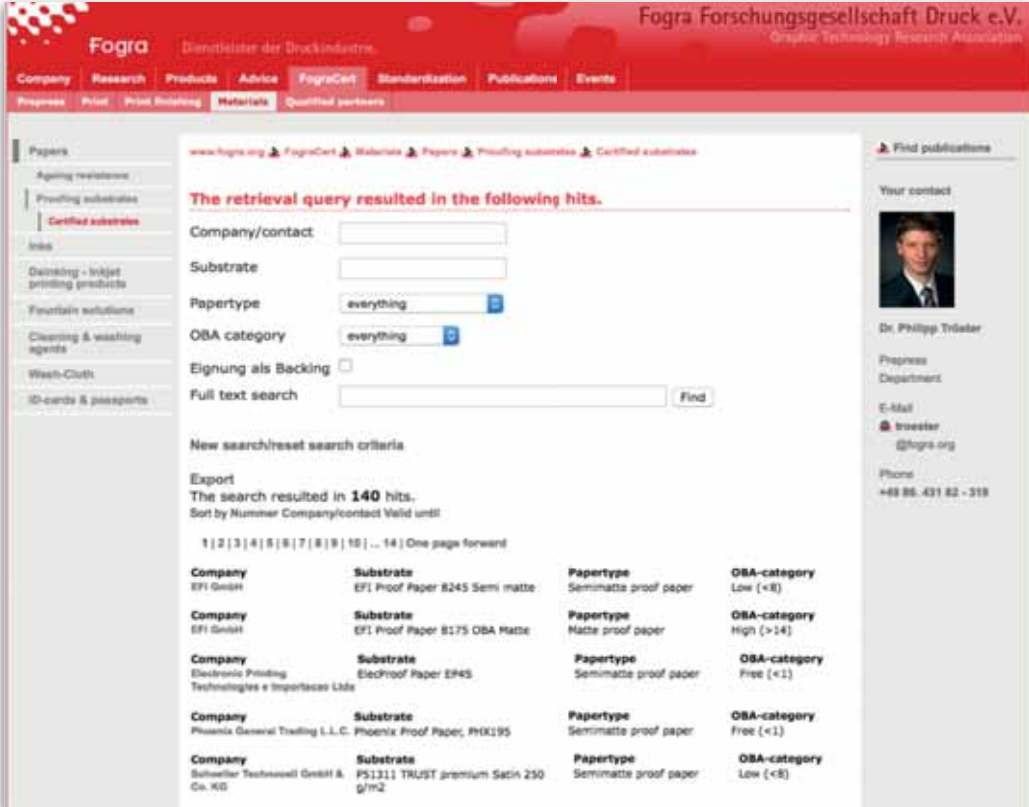
Selection of inkjet substrates sorted by ΔB (printed on EP4880)



5. Ask for Fogra-certified paper

- Fogra checks proofing paper
- white backer, OBA amount, gloss, gamut etc.
- permanence as ISO 12647-7:2015+

ΔB	OBA amount
< 1	no OBA
<= 4	faint
<= 8	low
<= 14	moderate
> 14	high



The screenshot shows the Fogra website interface with search results for 'Certified substrates'. The search criteria are: Company/contact (empty), Substrate (empty), Papertype (everything), OBA category (everything), and Eignung als Backing (unchecked). The results show 140 hits, sorted by Number Company/contact Valid until. The first few results are:

Company	Substrate	Papertype	OBA-category
EFI GmbH	EFI Proof Paper 8245 Semi matte	Semimatte proof paper	Low (<8)
EFI GmbH	EFI Proof Paper 8175 OBA Matte	Matte proof paper	High (>14)
Electronic Printing Technologies e Imperisco Ltd	ElecProof Paper EP45	Semimatte proof paper	Free (<1)
Phoenix General Trading L.L.C.	Phoenix Proof Paper, PHX195	Semimatte proof paper	Free (<1)
Schweiller Technisol Gmbh & Co. KG	PS1311 TRUST premium Satin 250 g/m2	Semimatte proof paper	Low (<8)



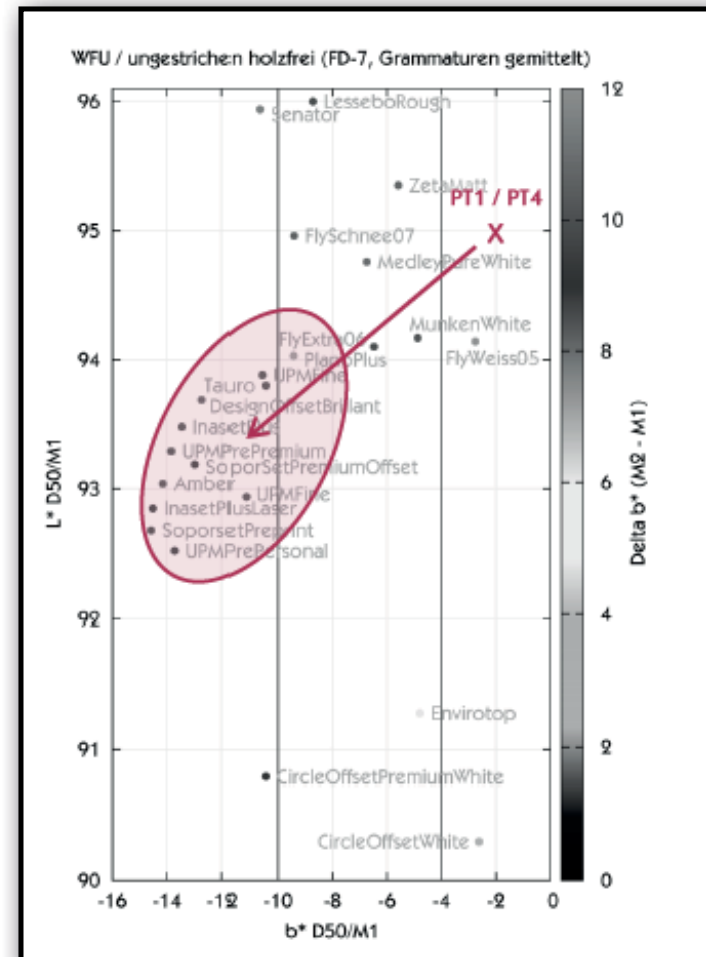
6. Managing the transition

- FOGRA51 (“PSO Coated V3”) and tools (Graycon) is ready to use
- Getting F51-prepared data and proofs will last a few years
- Getting F51-print ready is up to the print service provider
- Fogra recommends 1.1.2016 (interpreting Device-CMYK as ISO 12647-2 PC1)
- Upgrading to ISO 12647-2:2013 is a no brainer for FOGRA52
- First time ever an objective way of colour communication with OBA rich stock (no optical brightener comparison anymore, no gurus anymore)
- However, FOGRA52 is not ISO 12647-2:2013 PC5!

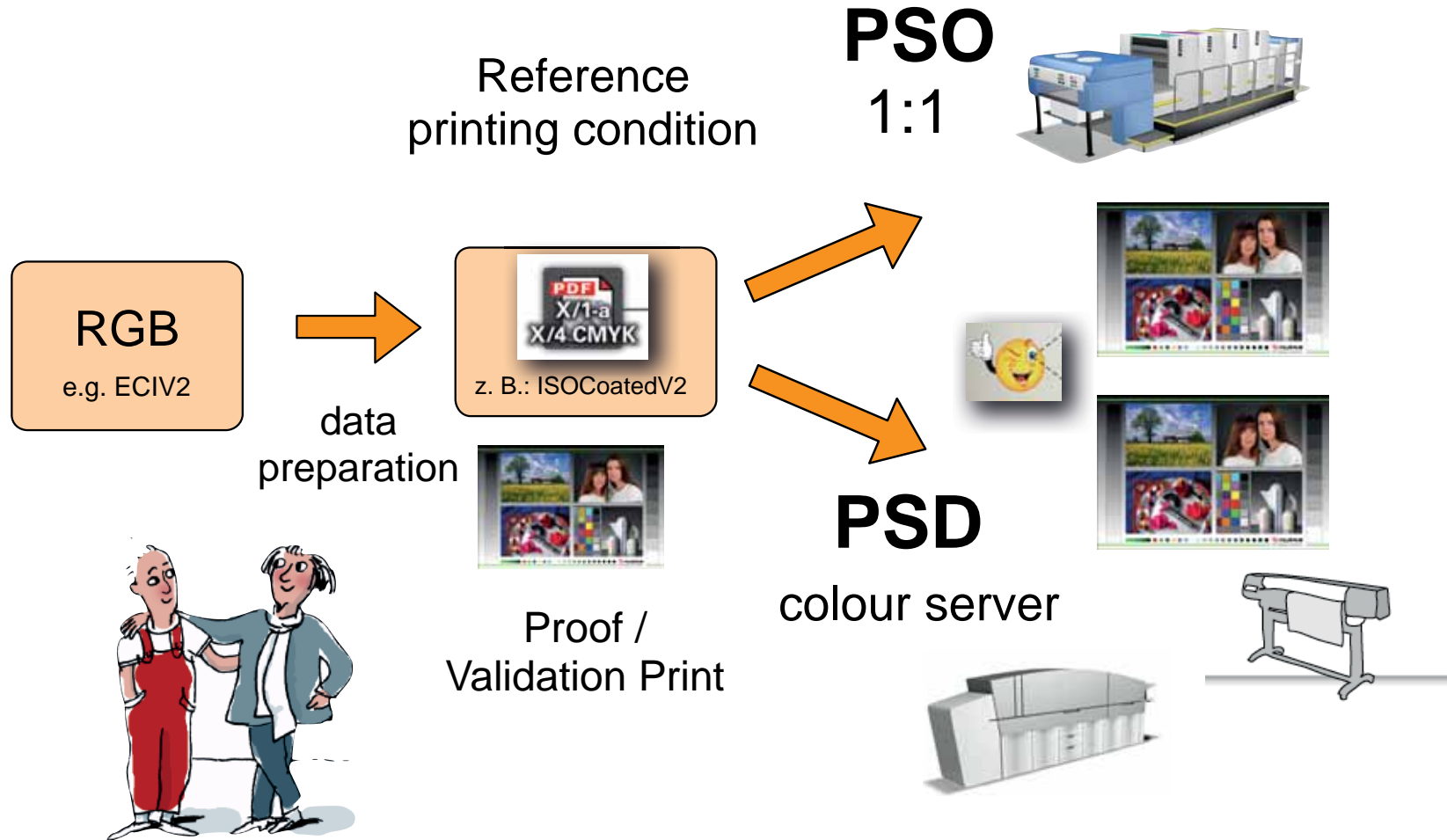
More information in the Workshop 33 (B. Utter)

6. Managing the transition

- Uncoated is a huge ball park
- Fogra plans to cover it with 3 printing conditions
 - $CIEb^* = 8$ for yellowish book printing papers
 - $CIEb^* = -4$ for ISO spot on uncoated stock (exotic)
 - $CIEb^* = -10$ for practical uncoated stock (following the ISO principles defined in Annex A)



6. Managing the transition



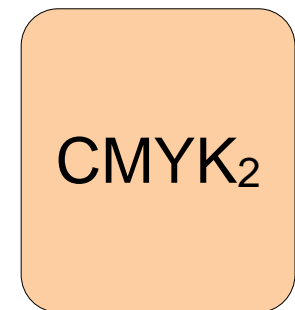
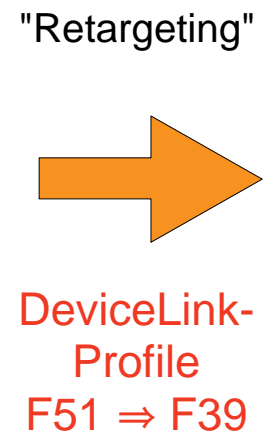
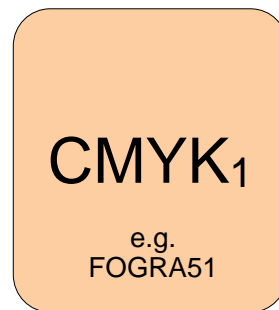
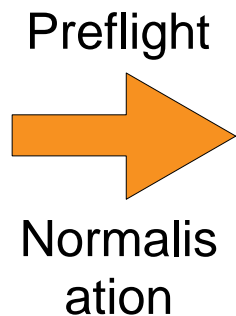
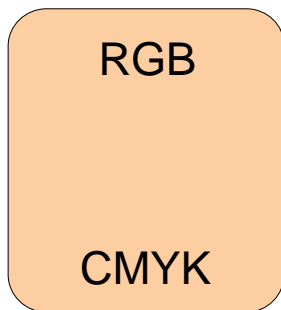
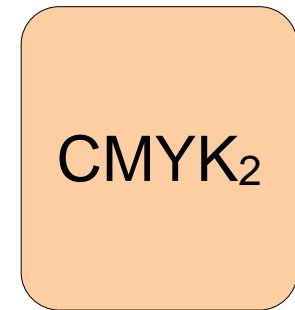
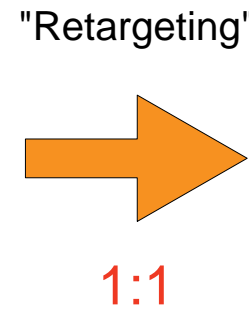
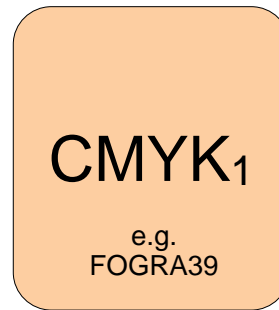
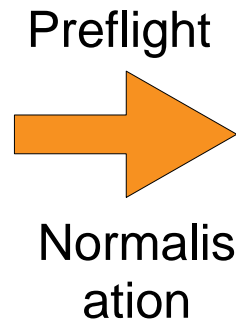
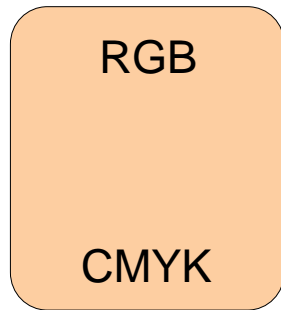
PSD: ProcessStandard Digital

6. Managing the transition

Customer data

Reference

Printing according
old ISO

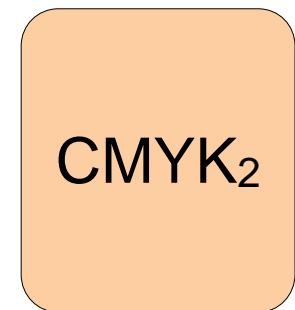
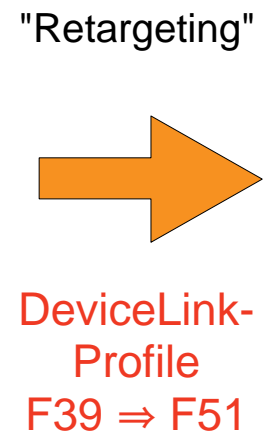
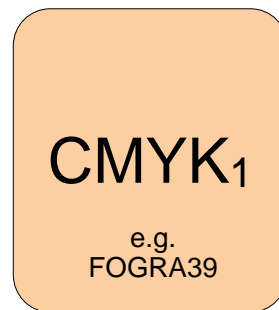
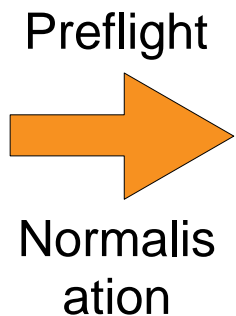
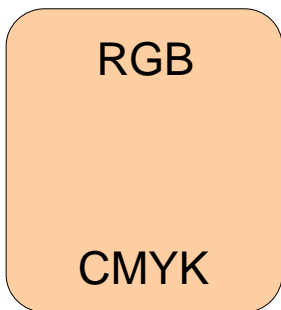
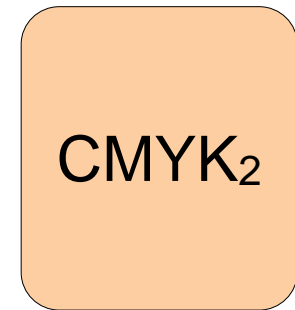
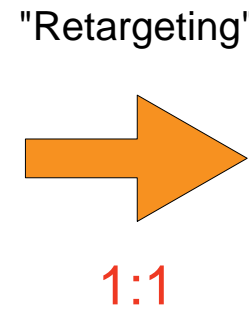
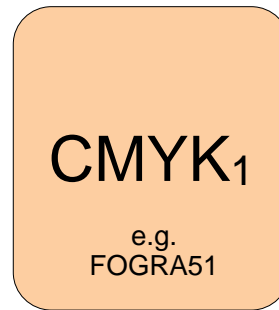
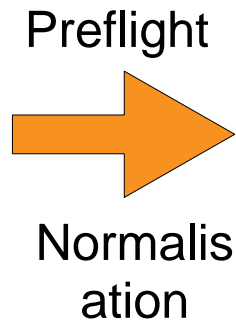
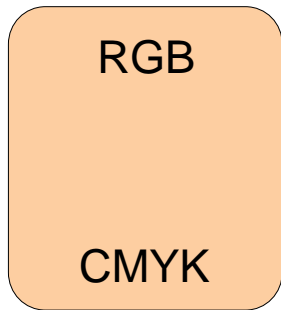


6. Managing the transition

Customer data

Reference

Printing according
new ISO



6. hands on

- The colour management event in Europe
- Only user presentations (no manufacturers)



Steffen Kujus, functional-area management print- & asset management of REWE Zentral AG speaks the first time about the requirements of REWE Group for its print suppliers. During his presentation, he will point out the demands and preconditions of quality-orientated clients to their print service providers.





Summary

- ISO 12647-2 (PSO & PSD) follow - Printing the expected
- Using M1 based illumination and measurement (“measure as you see”) provides outstanding proof to print matches
- Objective and high quality colour communication of OBA-rich substrates - for the first time
- The transition will not be for free, but you can use it to show your customers that you understand their expectations and provide high quality print results