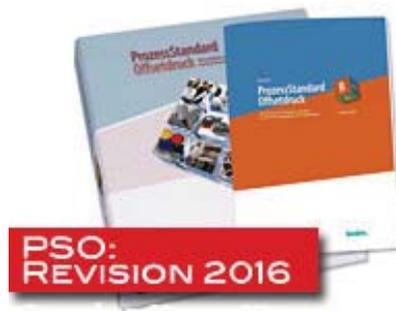


ProcessStandard Offset (PSO) and ProcessStandard Digital (PSD) – printing the expected in offset and digital printing



Agenda

1. Fogra - Exploring | Testing | Certifying
2. Genesis of ISO 12647-2 and PSO
3. PSD - Meeting the digital challenges
4. FograCert ecosystem - testing PSO & PSD
5. Resume

1. Fogra - Exploring | Testing | Certifying

Fogra - the service provider
for the graphic arts industry
for over 60 years

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1. Fogra - Exploring | Testing | Certifying

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→ Applied Research & development



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1. Fogra - Exploring | Testing | Certifying

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- Applied Research & development
- Expert opinions, Testing & Certification



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1. Fogra - Exploring | Testing | Certifying

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- Applied Research & development
- Expert opinions, Testing & Certification
- Consultancy and Training



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1. Fogra - Exploring | Testing | Certifying

Fogra - the service provider
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for over 60 years

- Applied Research & development
- Expert opinions, Testing & Certification
- Consultancy and Training
- Standardisation



Oct. 2016

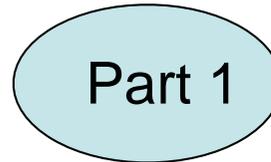




2. ISO 12647-x and its “friends”

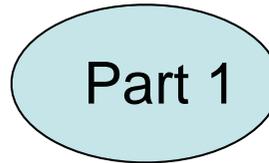
2. ISO 12647-x and its “friends”

- Printing Conditions
- Requirements
- Conformance



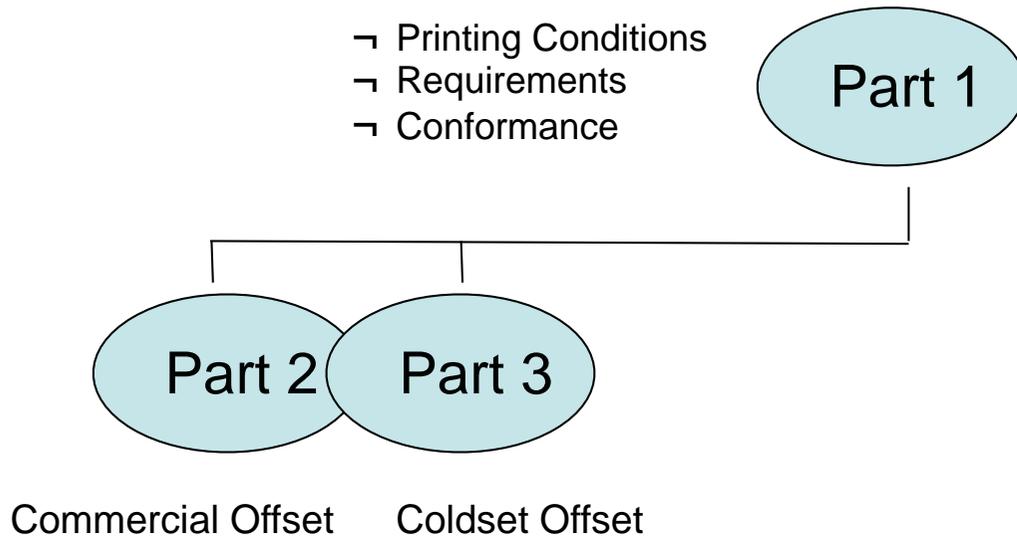
2. ISO 12647-x and its “friends”

- Printing Conditions
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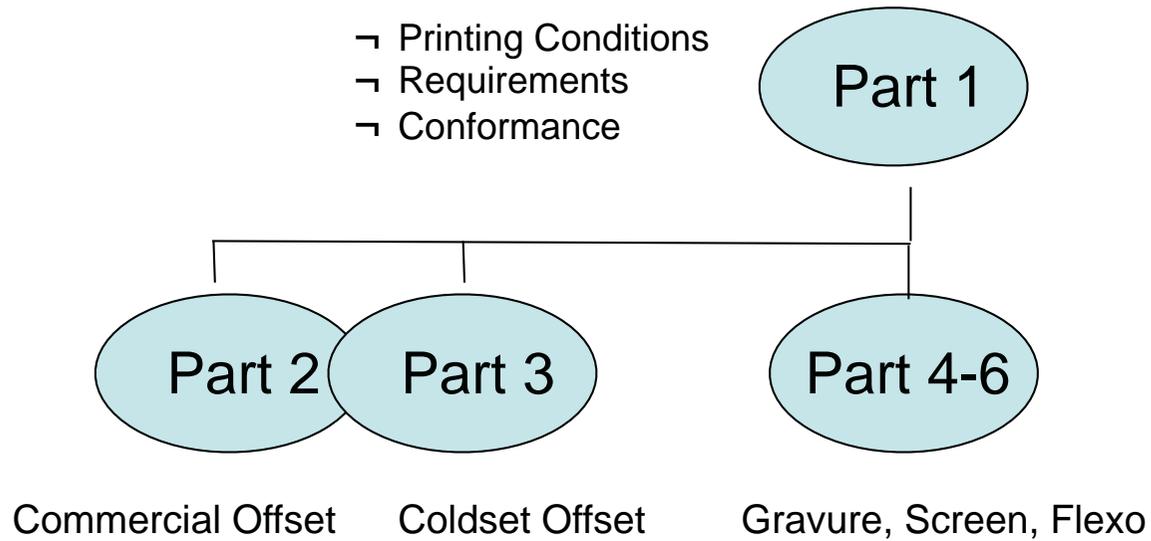


Commercial Offset

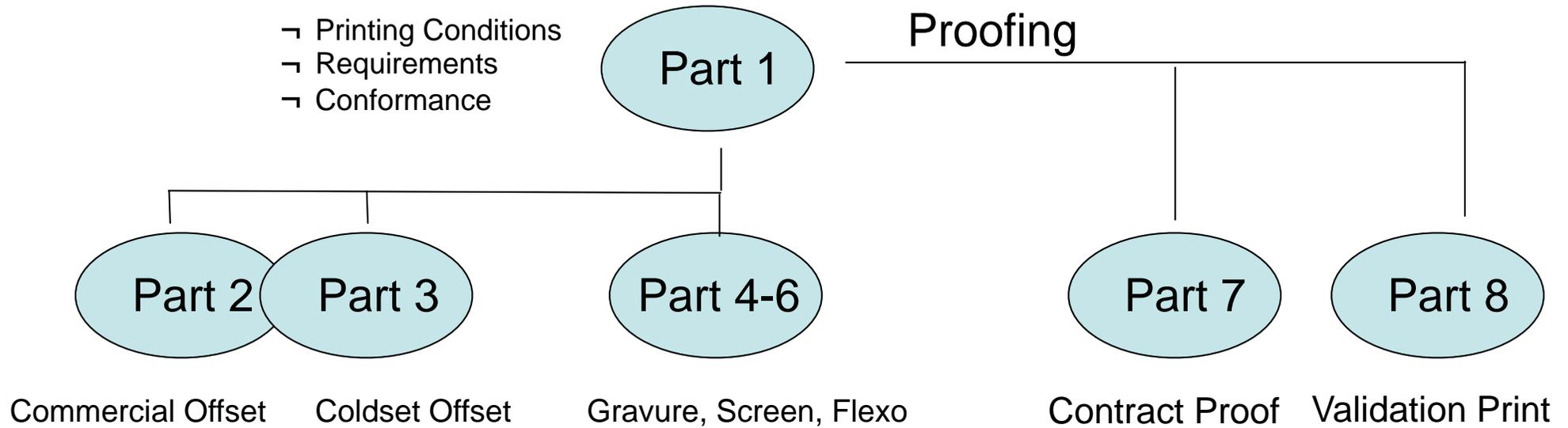
2. ISO 12647-x and its “friends”



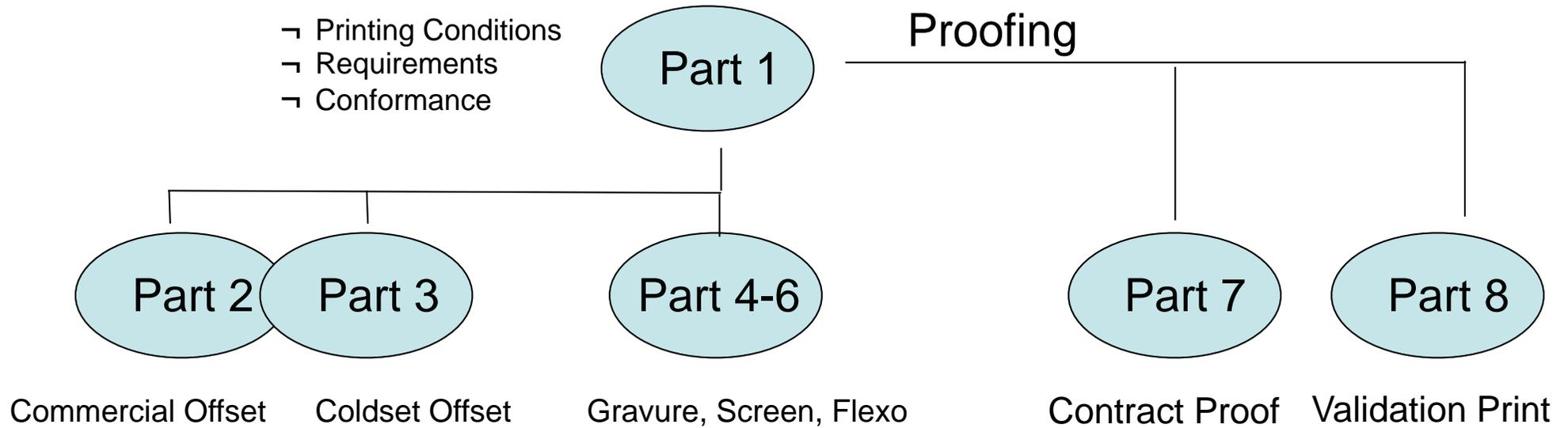
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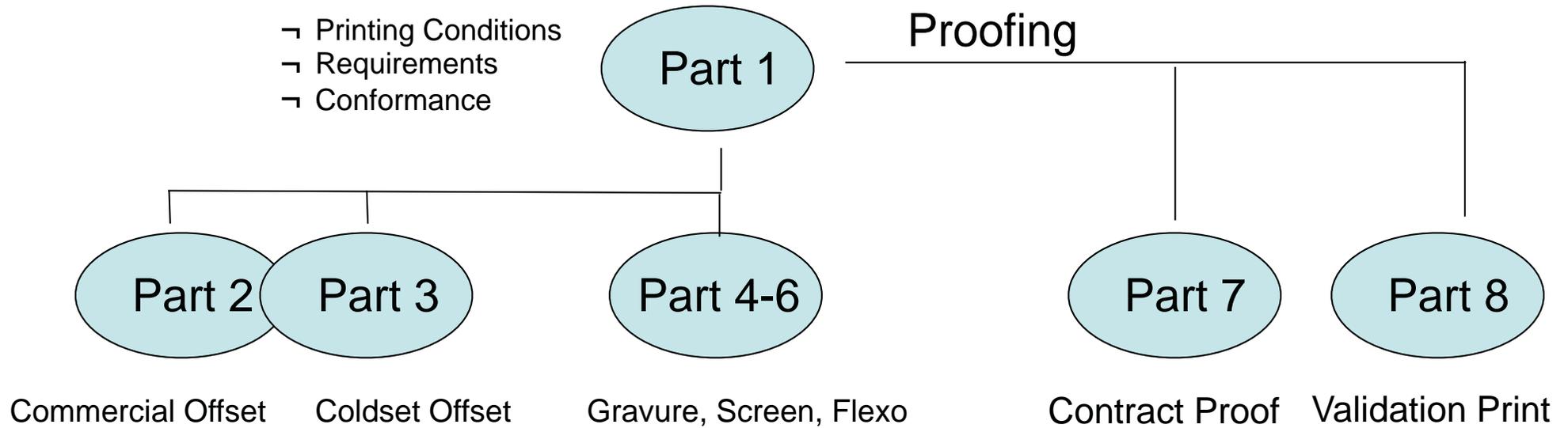


2. ISO 12647-x and its “friends”



Connecting Processes with related metrology

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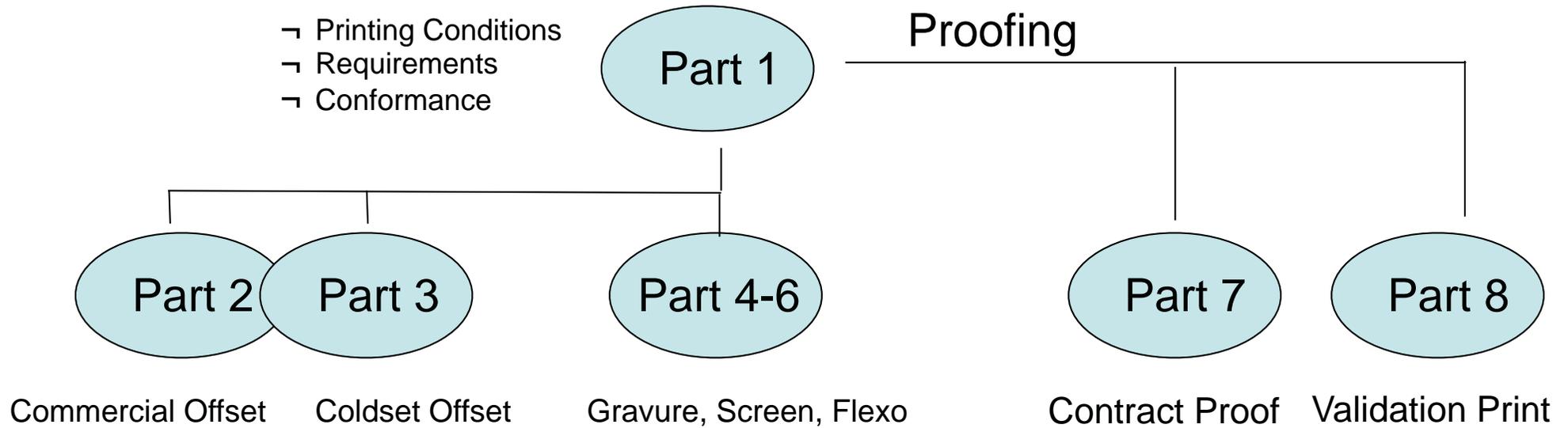


Connecting Processes with related metrology



ISO 3664 Viewing

2. ISO 12647-x and its “friends”



Connecting Processes with related metrology

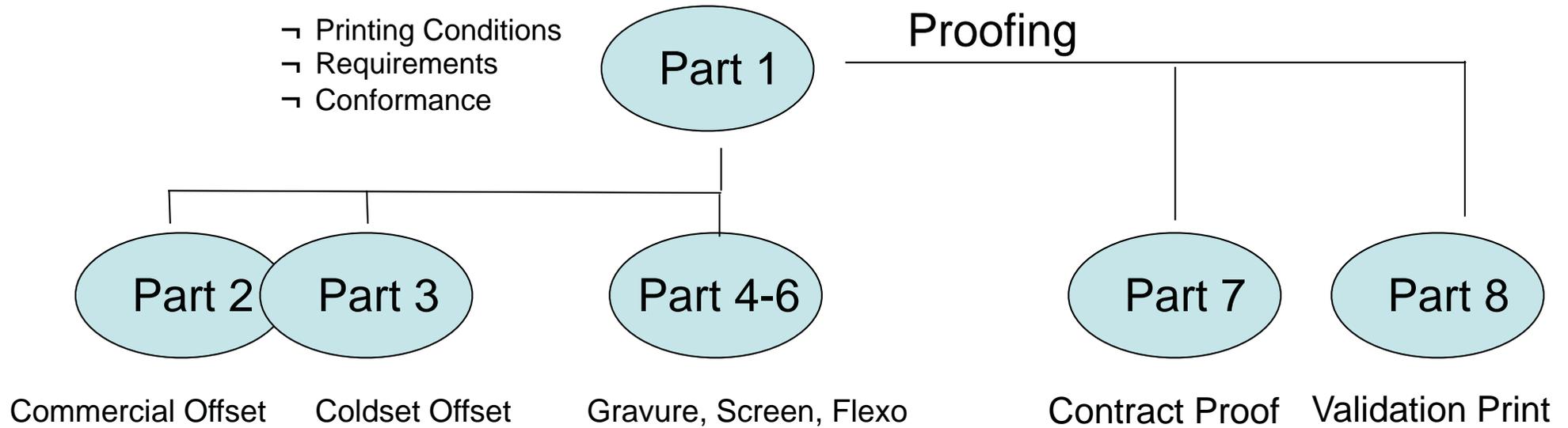


ISO 3664 Viewing



ISO 15076
Colour Management

2. ISO 12647-x and its “friends”



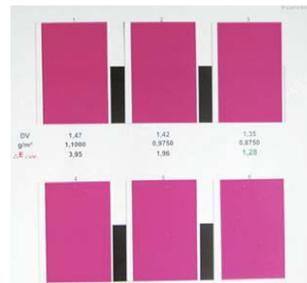
Connecting Processes with related metrology



ISO 3664 Viewing

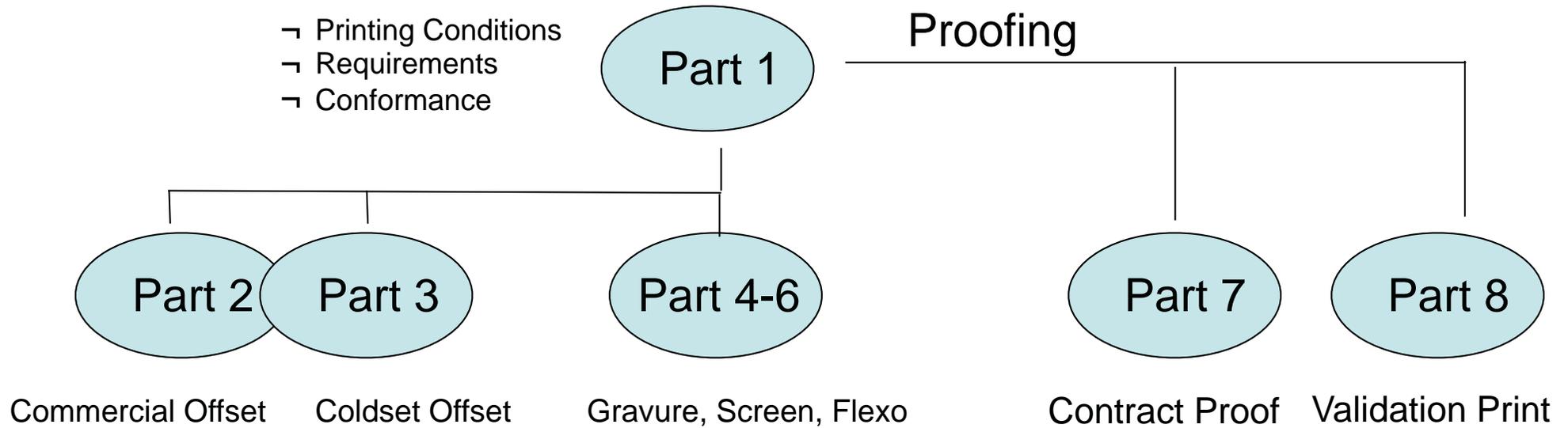


ISO 15076
Colour Management



ISO 2846
Printing Inks

2. ISO 12647-x and its "friends"



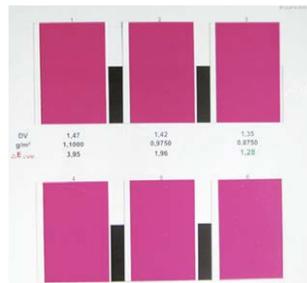
Connecting Processes with related metrology



ISO 3664 Viewing



ISO 15076 Colour Management

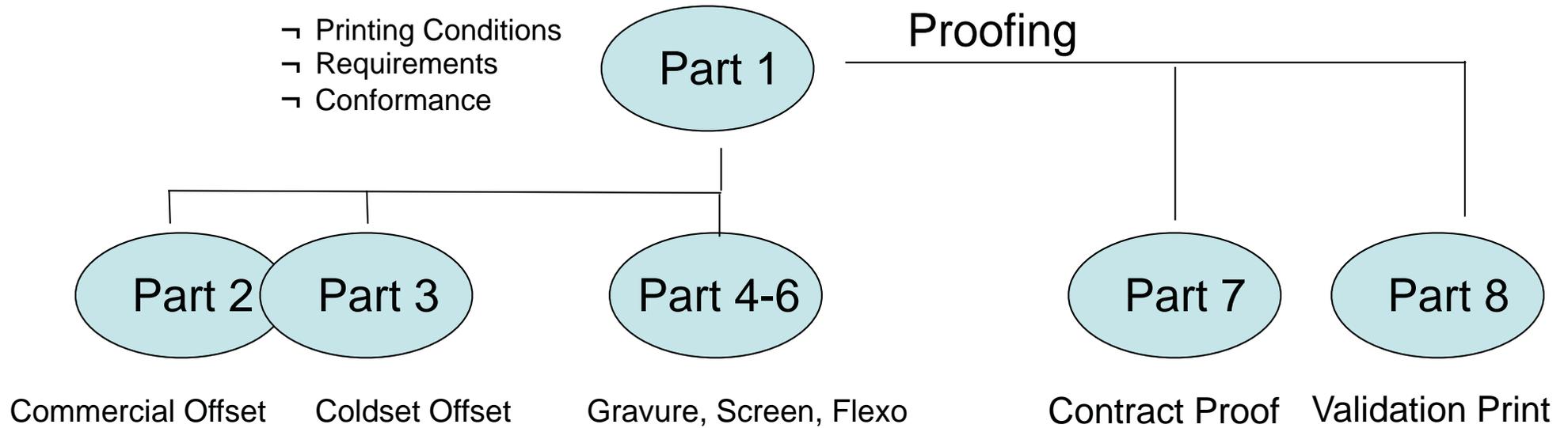


ISO 2846 Printing Inks



ISO 13655 Colour Measurement

2. ISO 12647-x and its "friends"



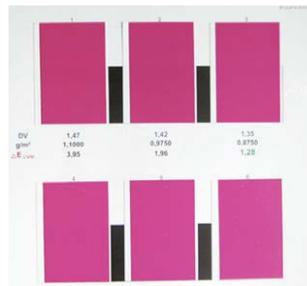
Connecting Processes with related metrology



ISO 3664 Viewing



ISO 15076
Colour Management



ISO 2846
Printing Inks



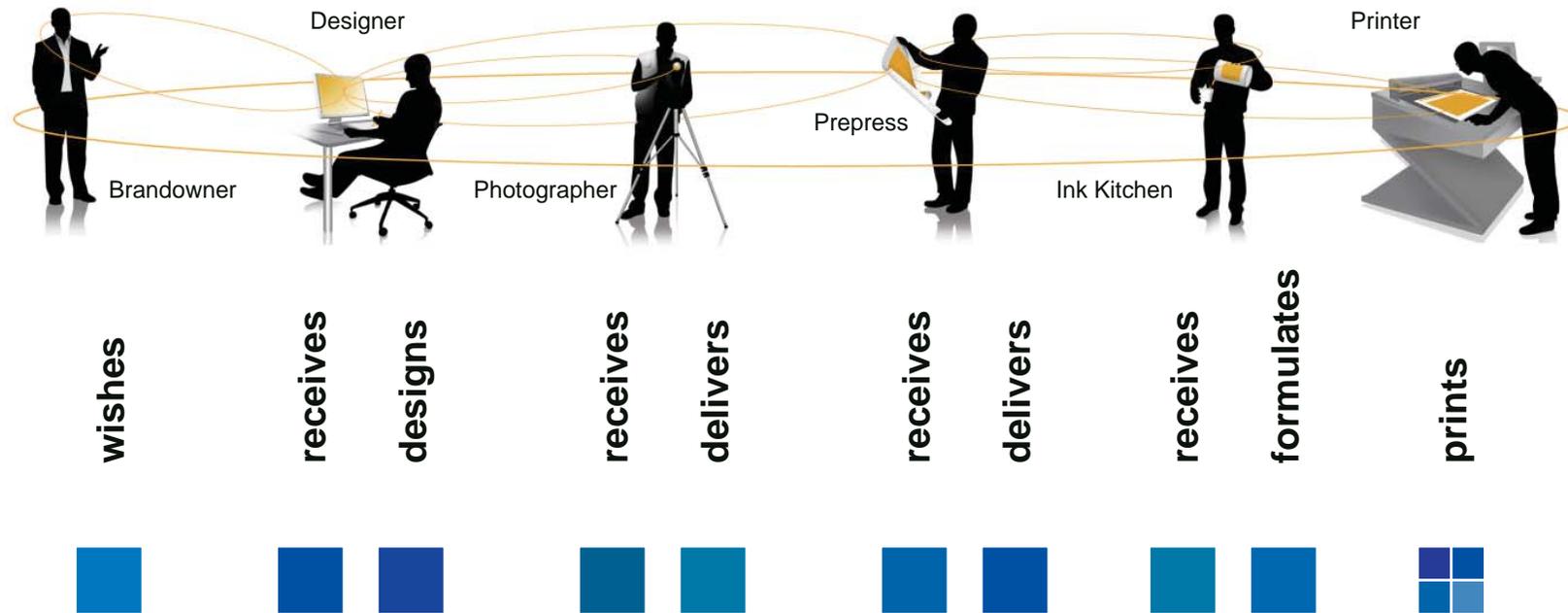
ISO 13655
Colour
Measurement

and
some
more



2. Standardisation means ...

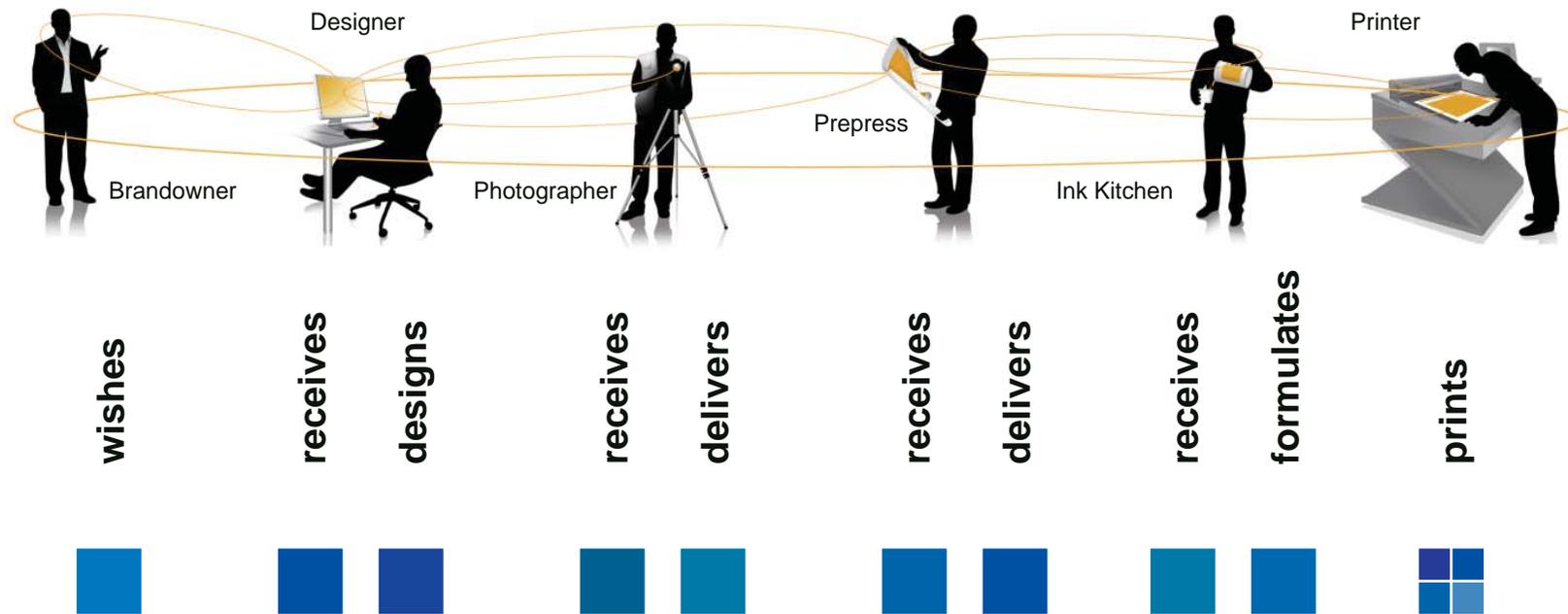
2. Standardisation means ...



Source: Payson, X-Rite

2. Standardisation means ...

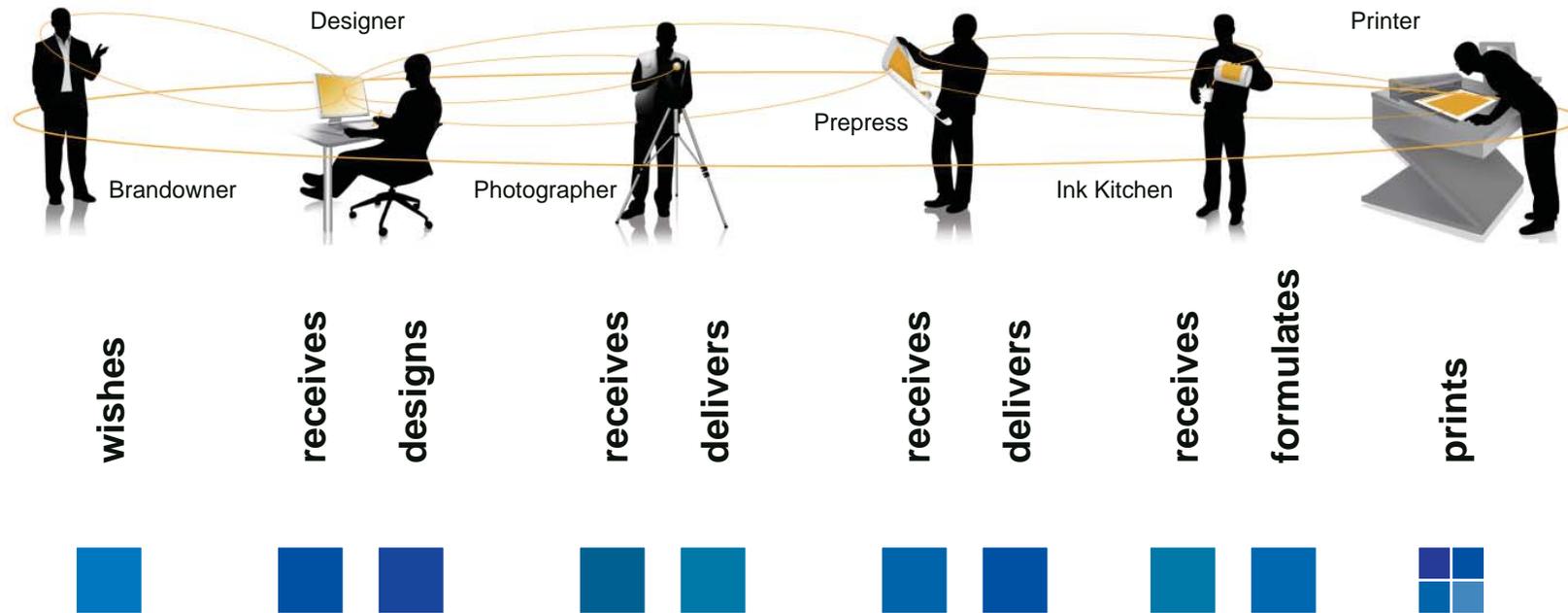
→ that anyone speaks the same language



Source: Payson, X-Rite

2. Standardisation means ...

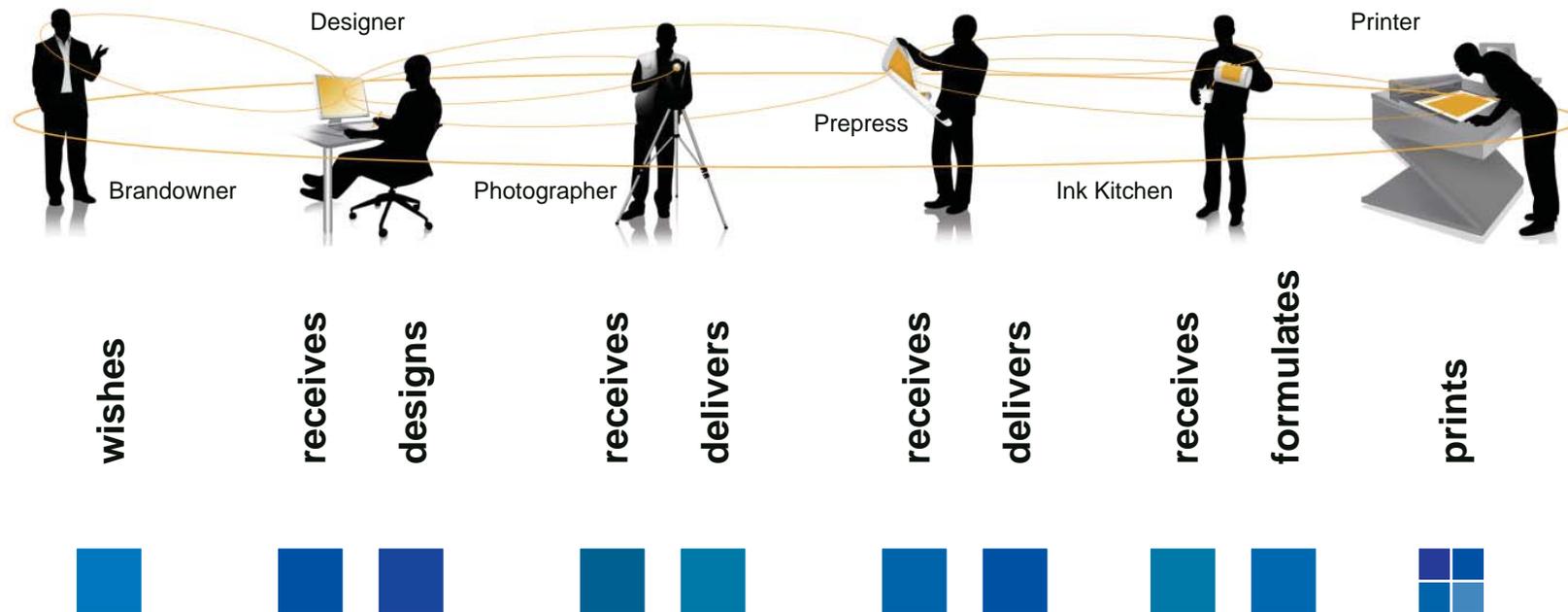
- that anyone speaks the same language
- that colours can be expressed numerically and not by words (Royal Blue)



Source: Payson, X-Rite

2. Standardisation means ...

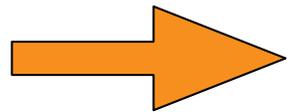
- that anyone speaks the same language
- that colours can be expressed numerically and not by words (Royal Blue)
- that processes are repeatable and controllable (In-House & across the globe)



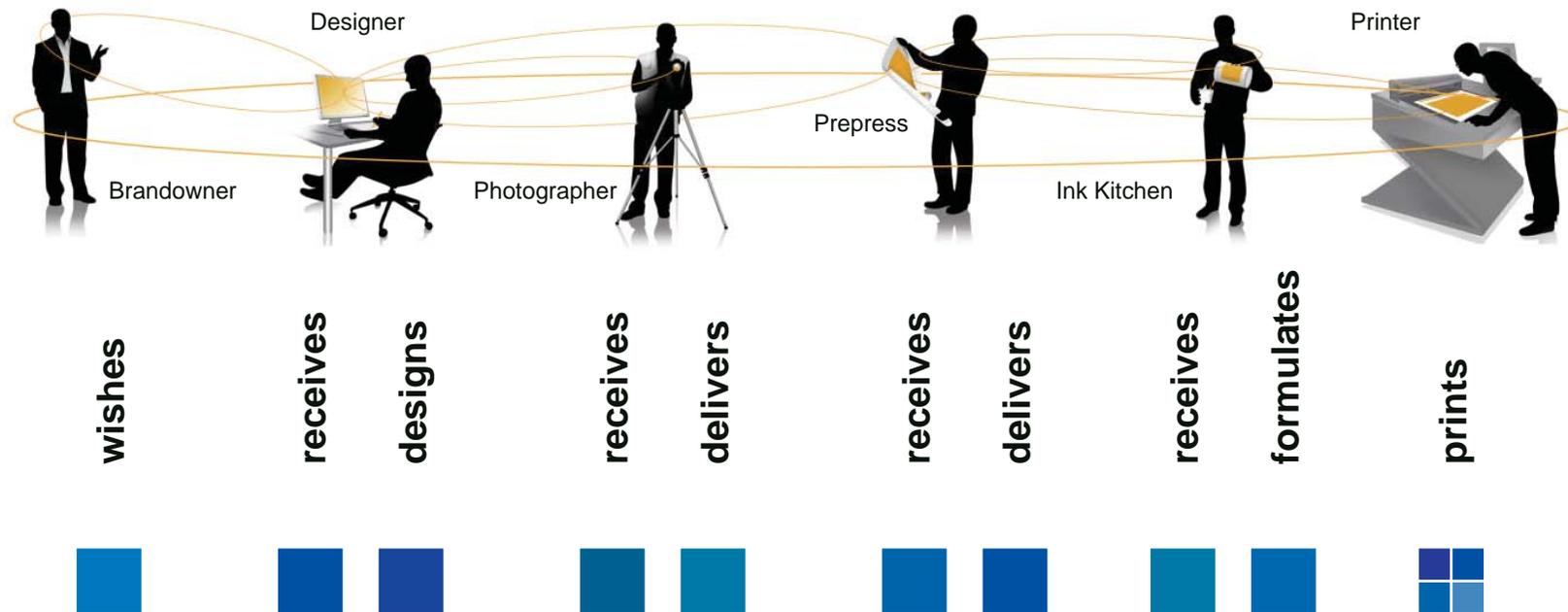
Source: Payson, X-Rite

2. Standardisation means ...

- that anyone speaks the same language
- that colours can be expressed numerically and not by words (Royal Blue)
- that processes are repeatable and controllable (In-House & across the globe)



To achieve predictability from design to printed product



Source: Payson, X-Rite



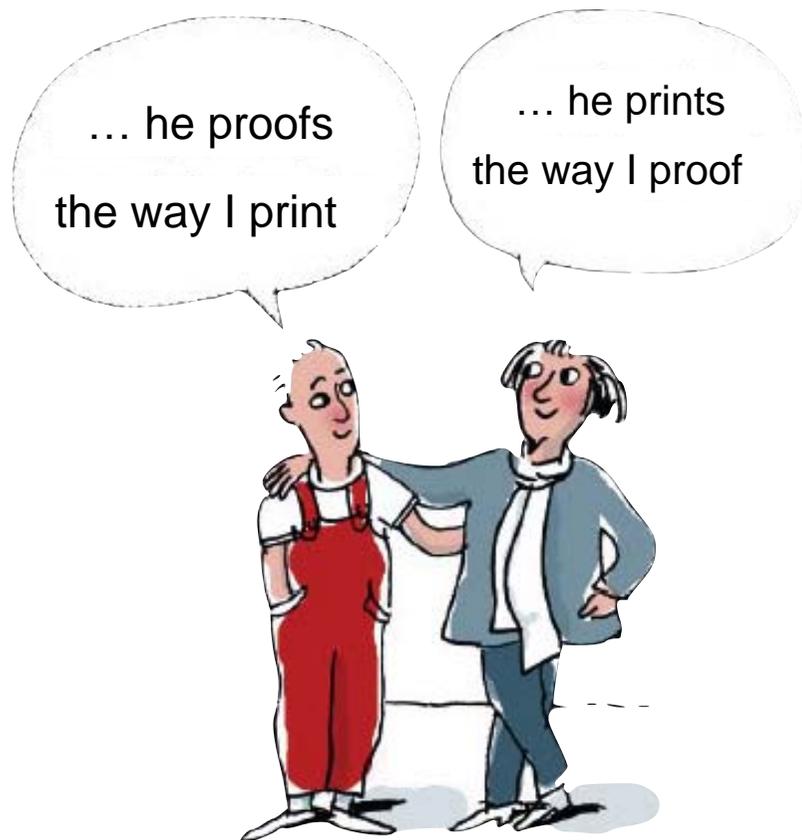
2. Idea behind PSO

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Minimum set of primary process parameters that bear the visual impression ➡ ***printing condition***

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Minimum set of primary process parameters that bear the visual impression ➡ **printing condition**

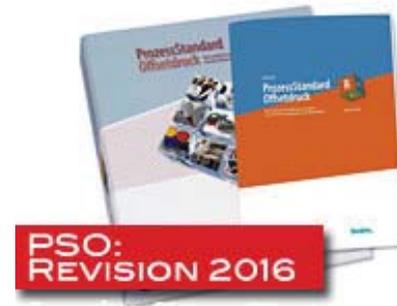
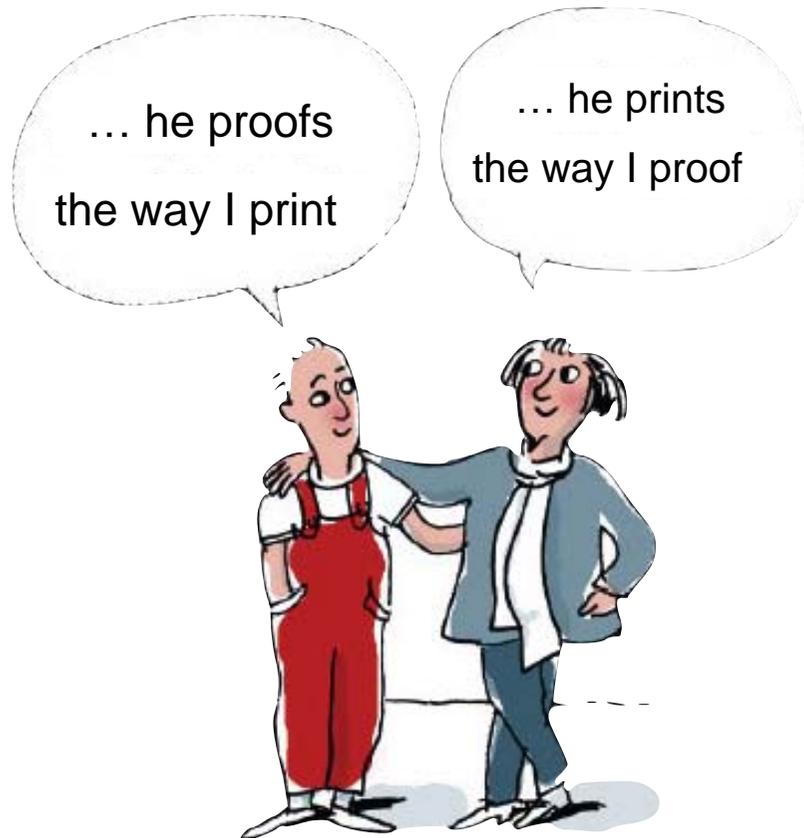


Printing the Expected

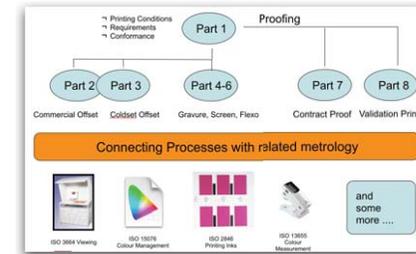
Source: F. Süßl

2. Idea behind PSO

Minimum set of primary process parameters that bear the visual impression → **printing condition**



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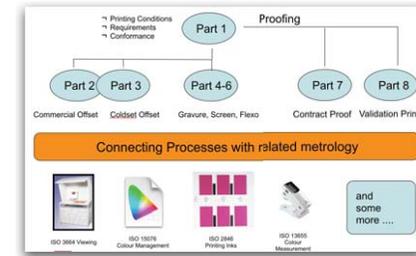
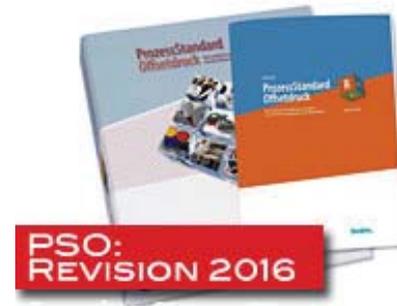
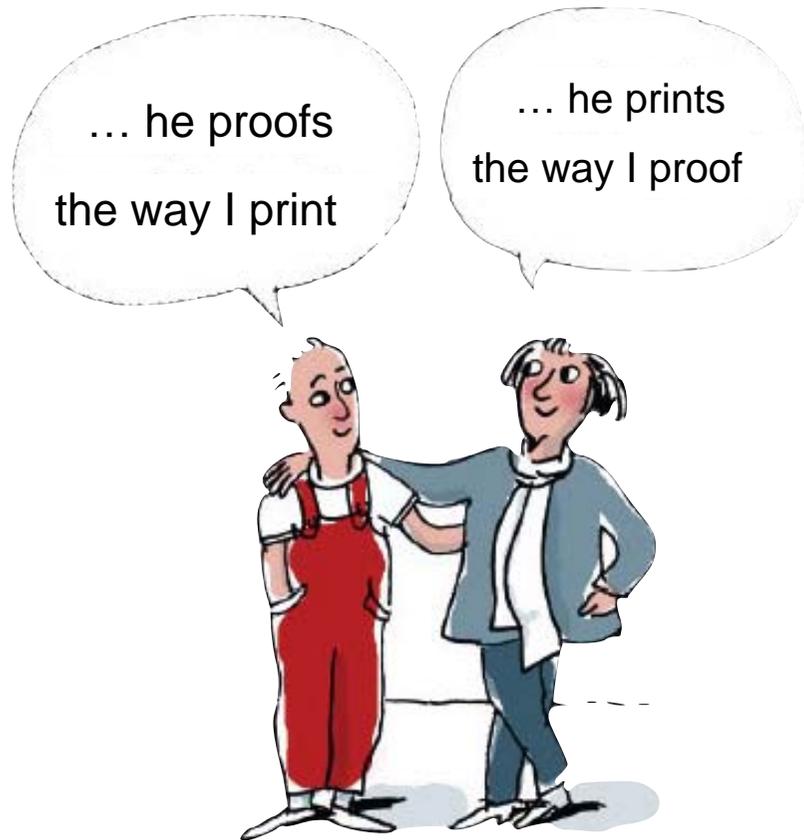
- Practical guidelines
- Tips & How to's
- Addition printing conditions
- ICC Profiles
- many more

Printing the Expected

Source: F. Süßl

2. Idea behind PSO

Minimum set of primary process parameters that bear the visual impression → **printing condition**



=

+

- Practical guidelines
- Tips & How to's
- Addition printing conditions
- ICC Profiles
- many more



Printing the Expected

Source: F. Süßl



2. PSO and ISO 12647-2 – Going hand in hand

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1984



2. PSO and ISO 12647-2 – Going hand in hand

1984



1993*



2. PSO and ISO 12647-2 – Going hand in hand

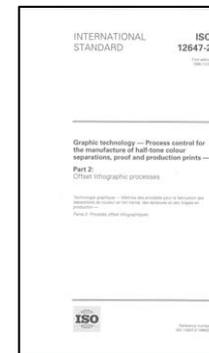
1984



1993*



1996



2. PSO and ISO 12647-2 – Going hand in hand

1984



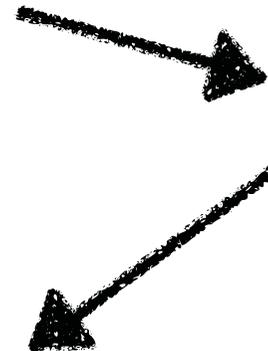
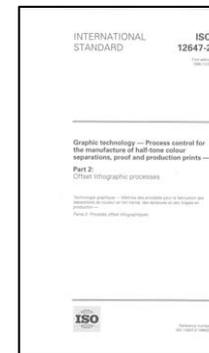
1993*



2001/
2003



1996



2. PSO and ISO 12647-2 – Going hand in hand

1984



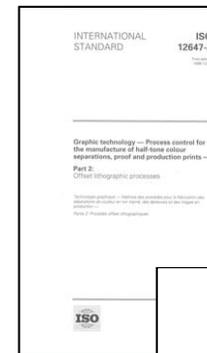
1993*



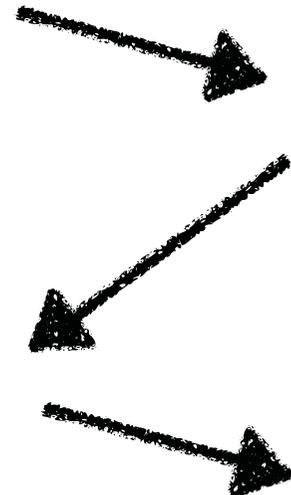
2001/
2003



1996



2004
Amd.
2007



2. PSO and ISO 12647-2 – Going hand in hand

1984



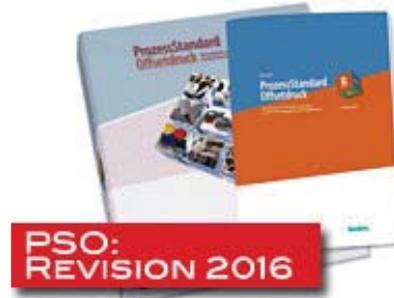
1993*



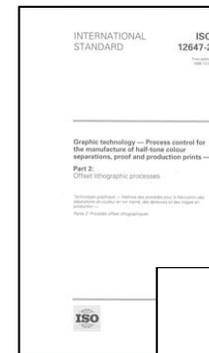
2001/
2003



2016



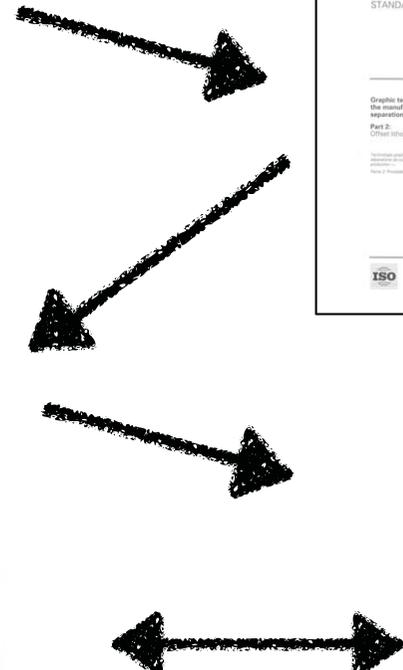
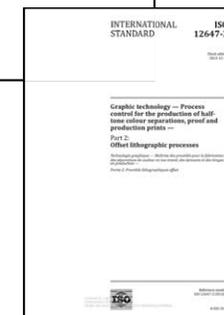
1996



2004
Amd.
2007

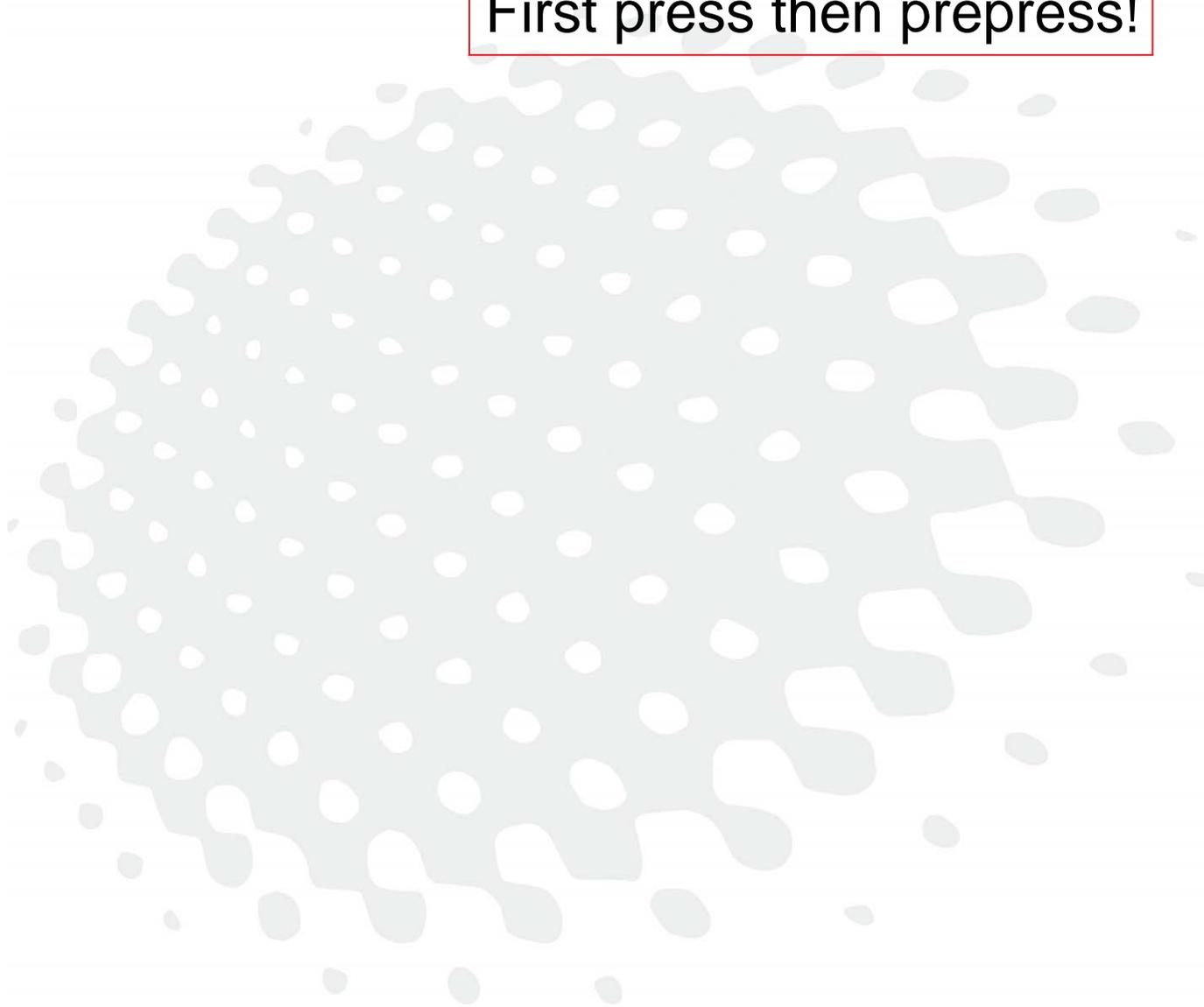


2013



2. The underlying concept of ISO 12647

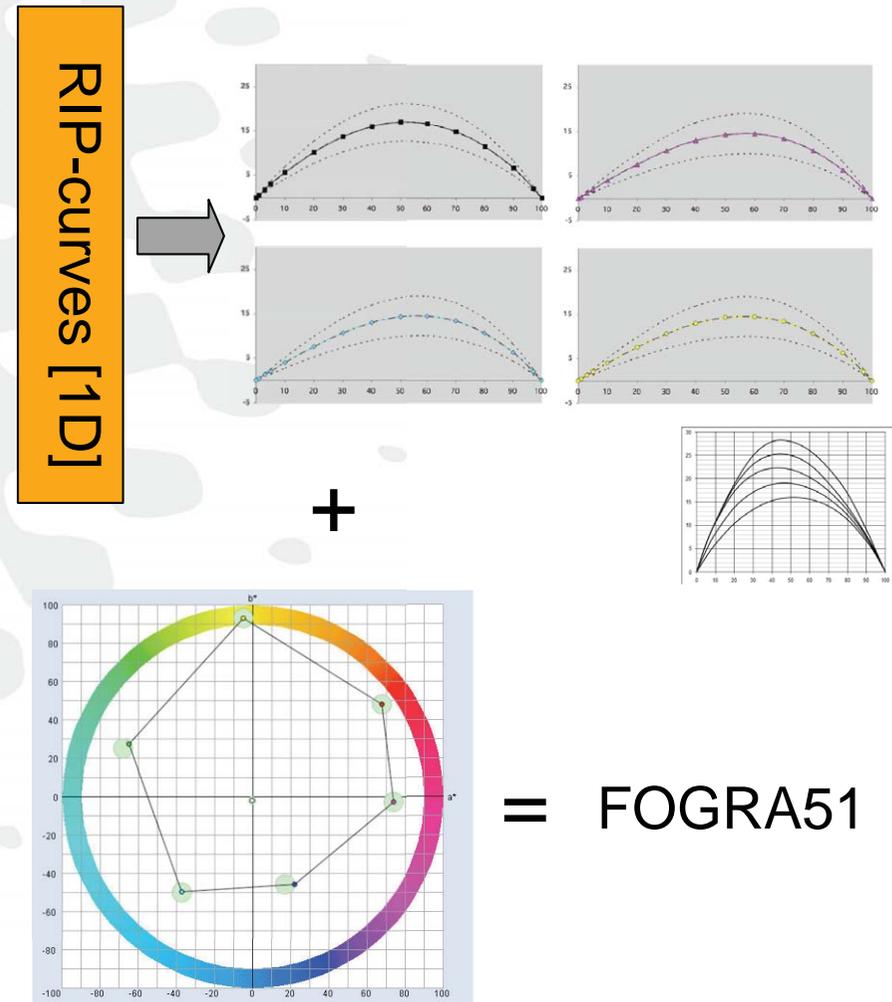
First press then prepress!



2. The underlying concept of ISO 12647

First press then prepress!

Press [process control]

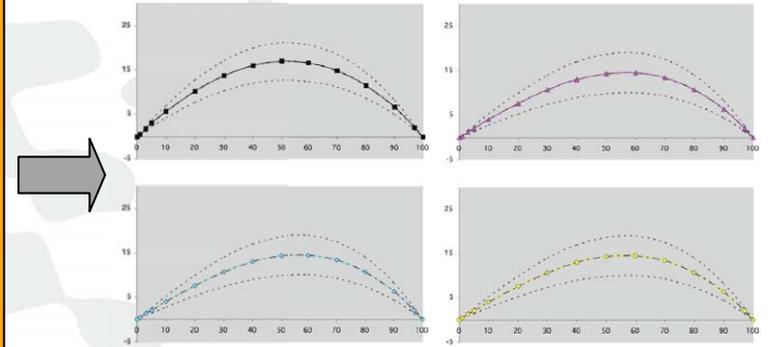


2. The underlying concept of ISO 12647

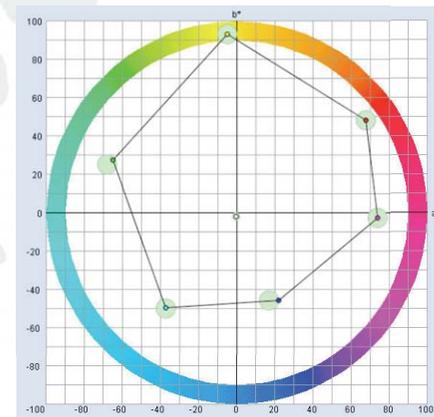
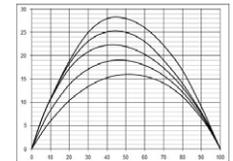
First press then prepress!

Press [process control]

RIP-curves [1D]



+



= FOGRA51

2. The underlying concept of ISO 12647

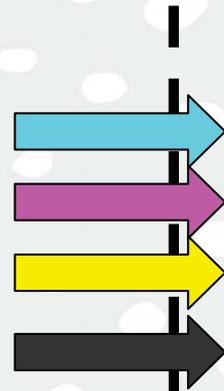
First press then prepress!

prepress

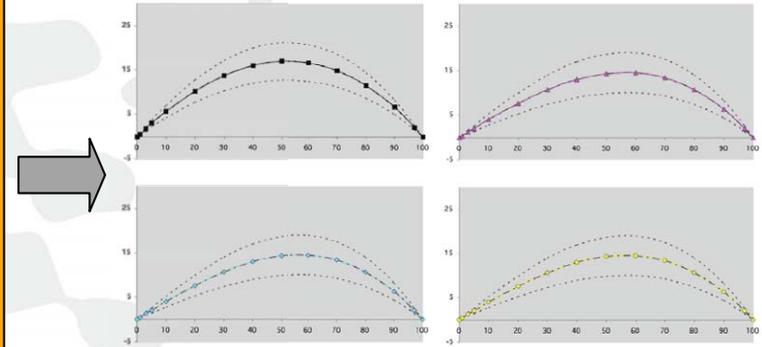
Press [process control]



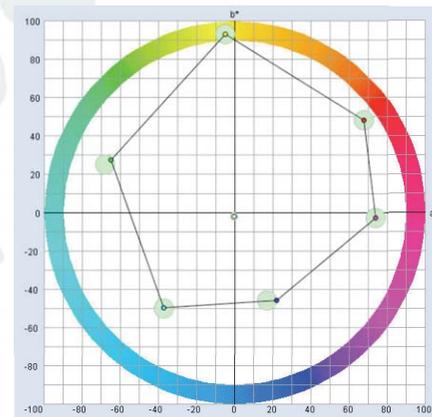
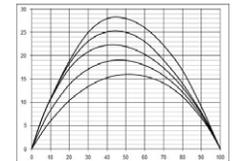
ISOcoatedV2



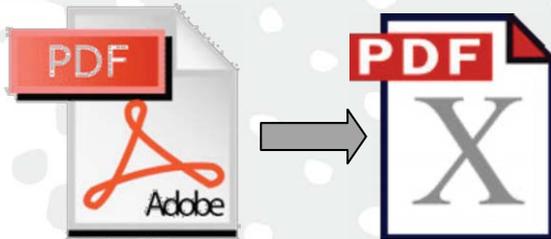
RIP-curves [1D]



+



= FOGRA51



- ✓ Resolution OK?
- ✓ Colour Space [CMYK] OK?
- ✓ Fonts embedded?
- ✓ Interpreting [Transparency, ..]



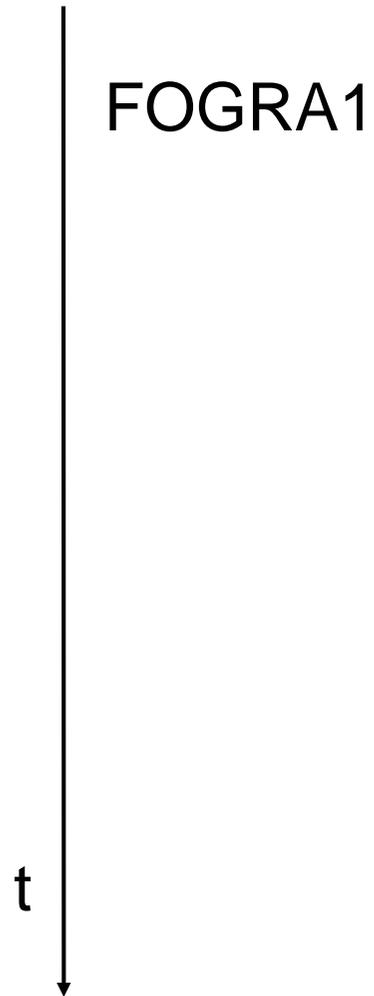
2. Evolution of Characterization Data

2. Evolution of Characterization Data

t

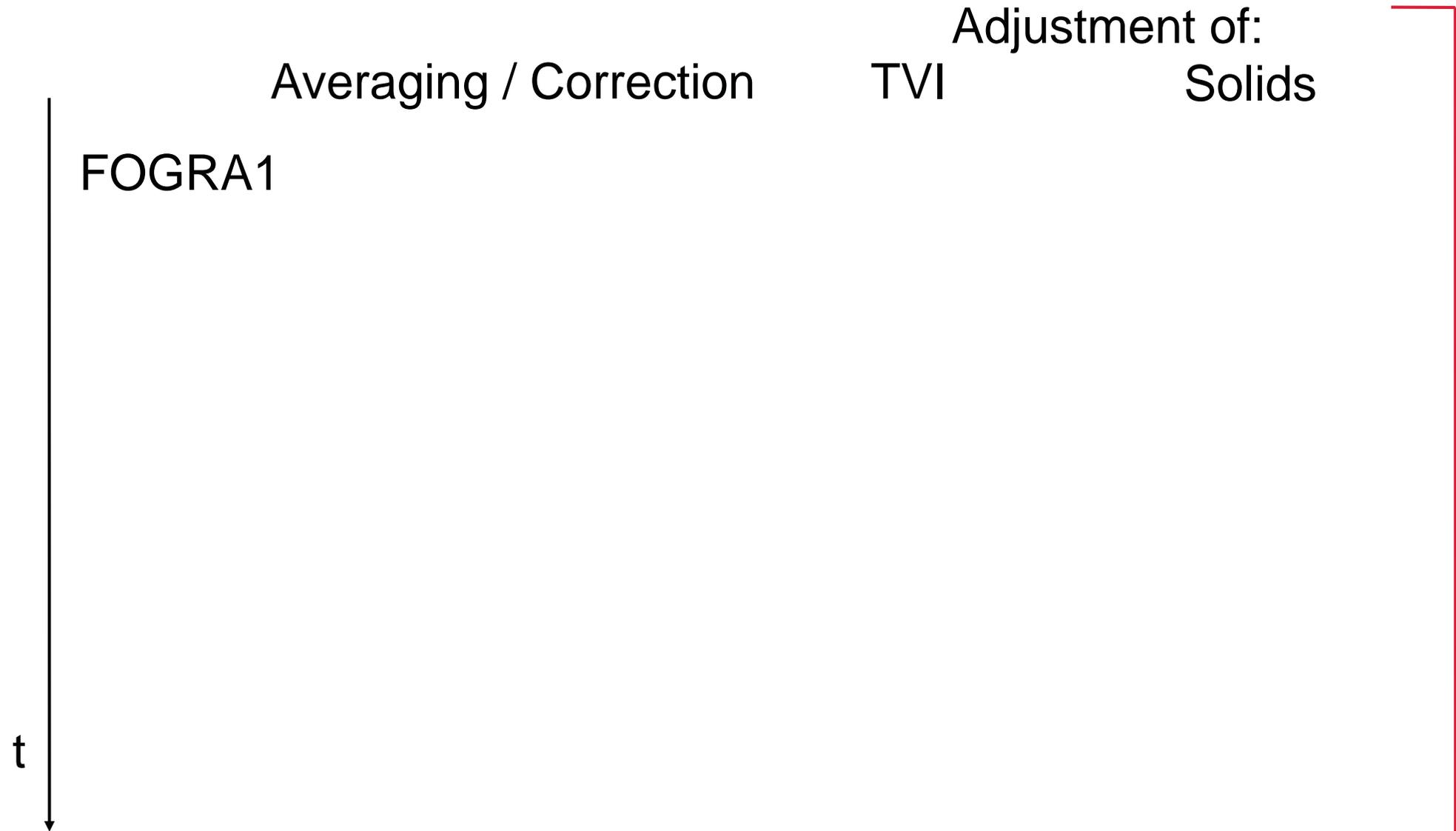
A vertical black arrow pointing downwards, indicating the progression of time (t).

2. Evolution of Characterization Data





2. Evolution of Characterization Data

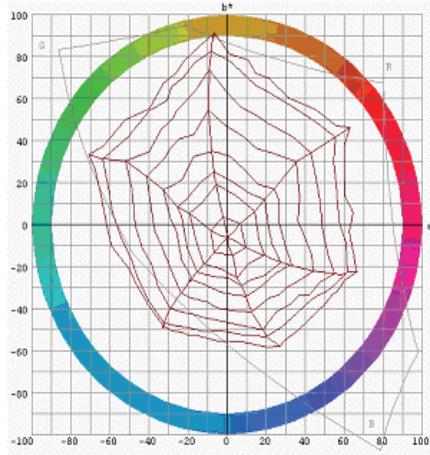


2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



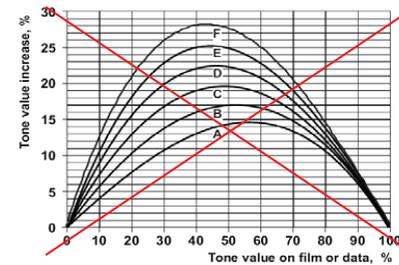
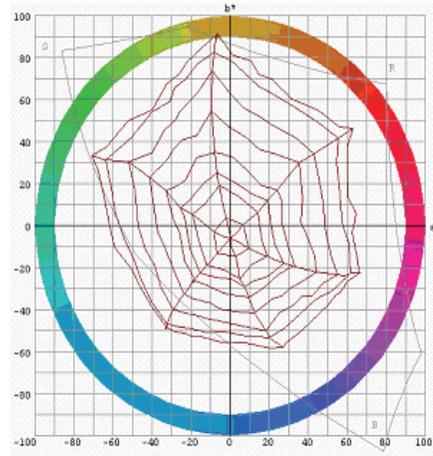
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2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



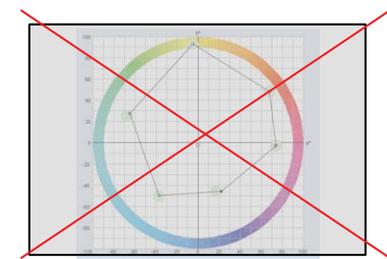
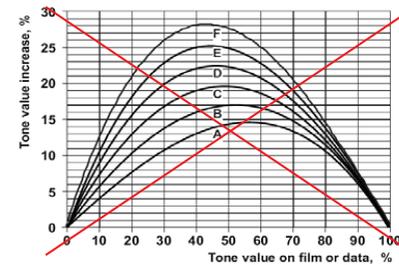
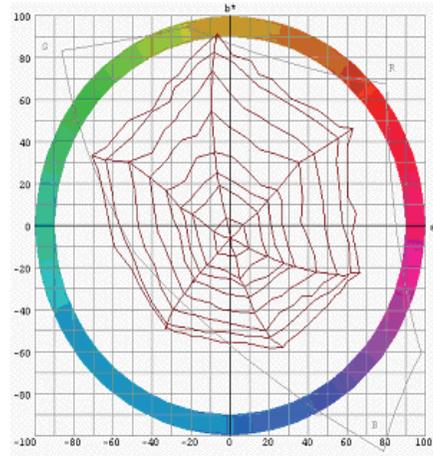
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2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



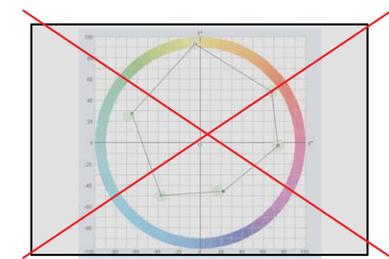
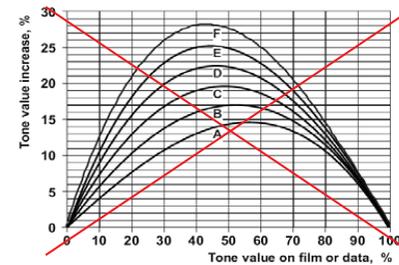
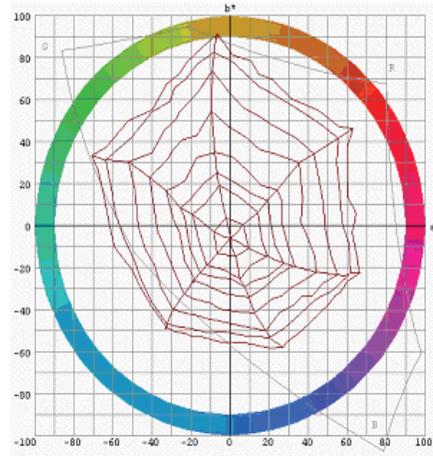
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2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



FOGRA11

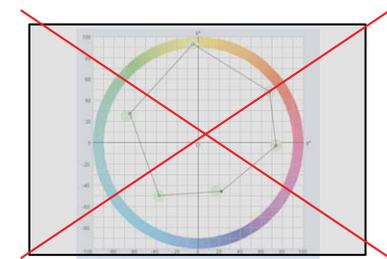
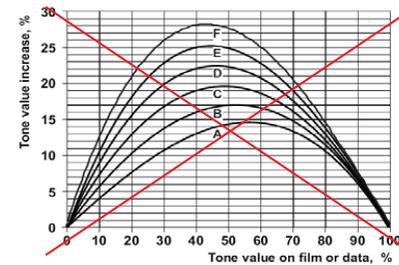
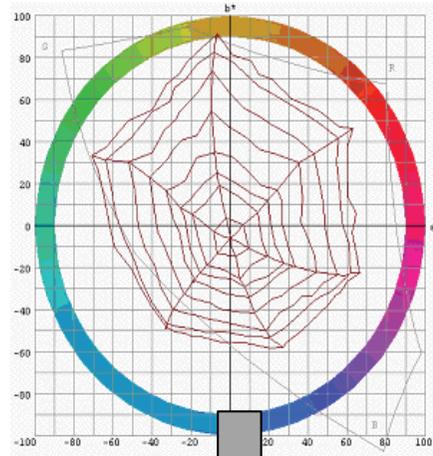
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2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



FOGRA11

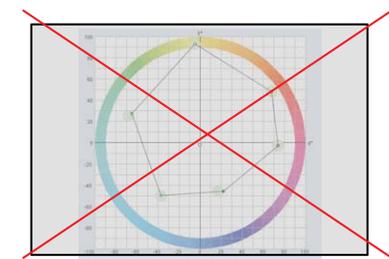
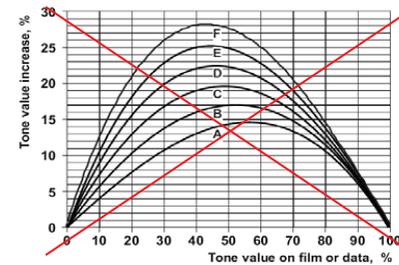
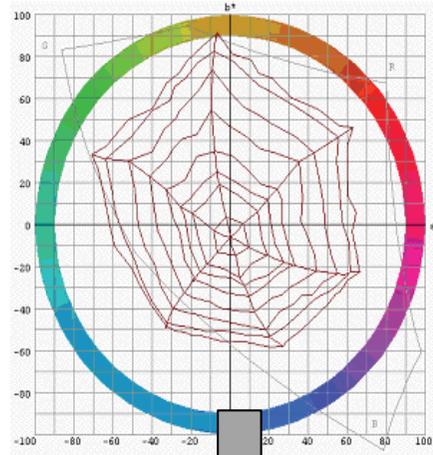
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2. Evolution of Characterization Data

Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



FOGRA11

FOGRA27

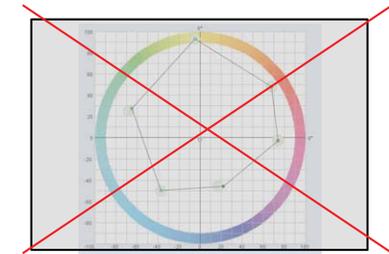
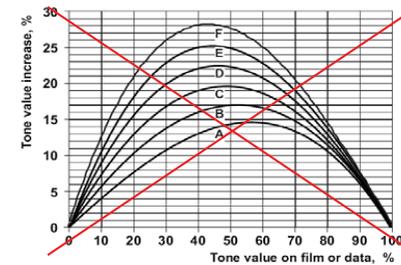
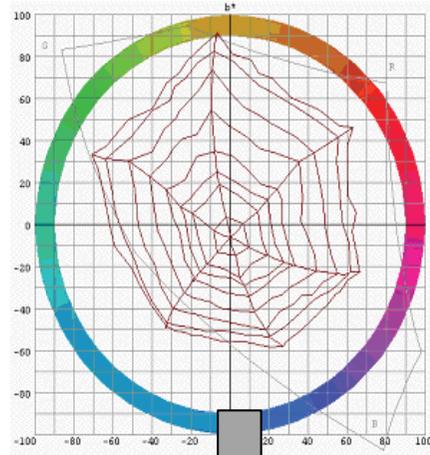
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2. Evolution of Characterization Data

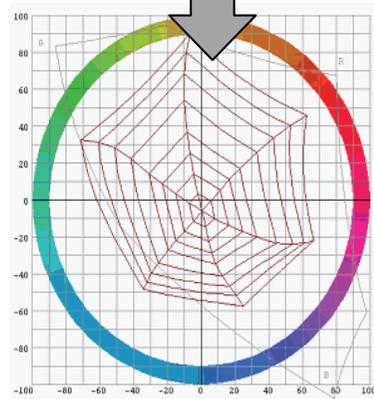
Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



FOGRA11



FOGRA27

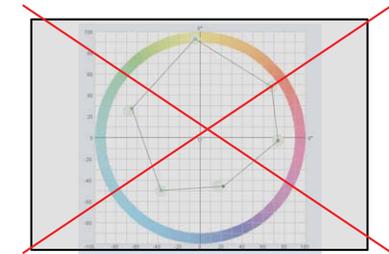
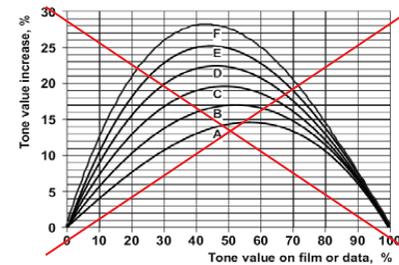
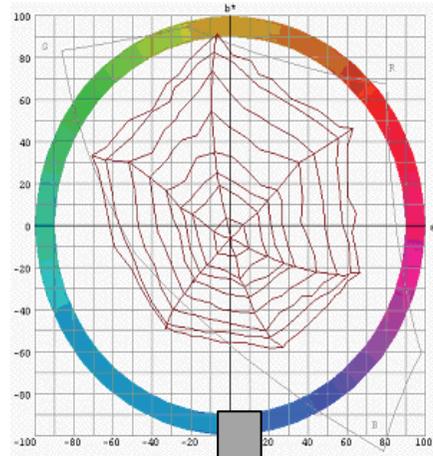
t

2. Evolution of Characterization Data

Averaging / Correction

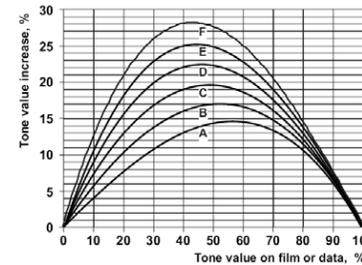
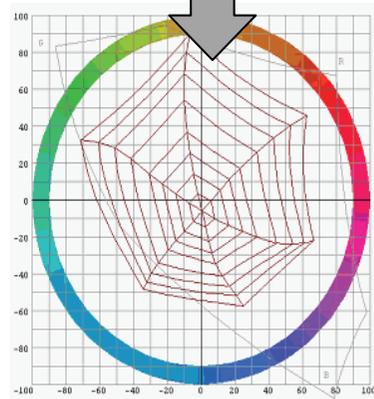
Adjustment of:
TVI
Solids

FOGRA1



FOGRA11

FOGRA27



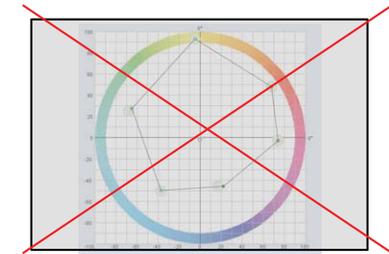
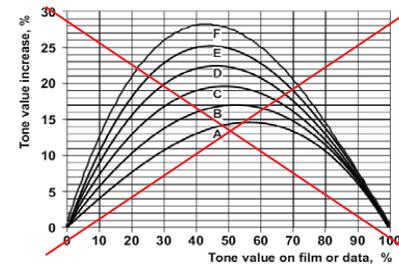
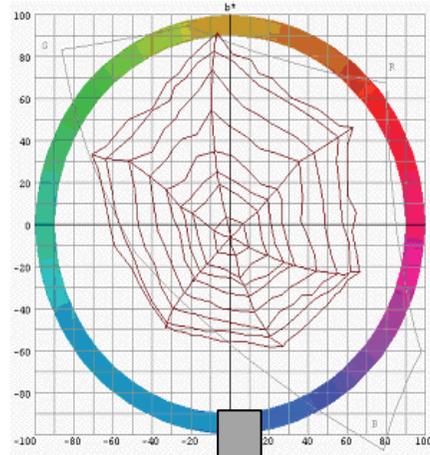
t

2. Evolution of Characterization Data

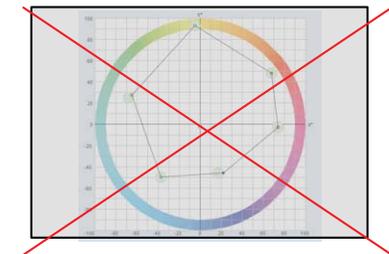
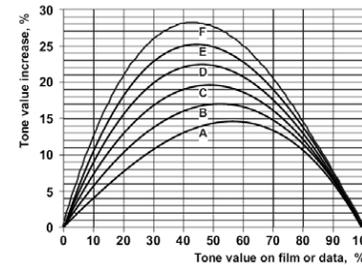
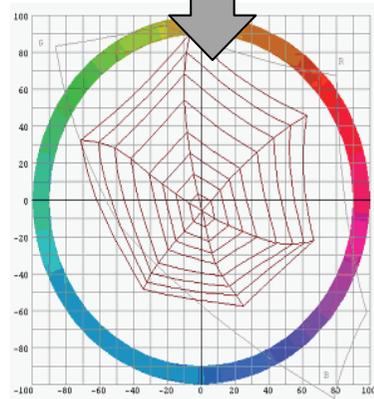
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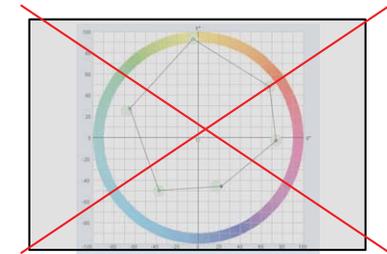
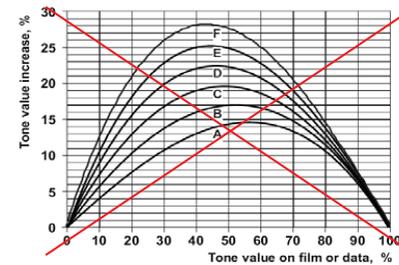
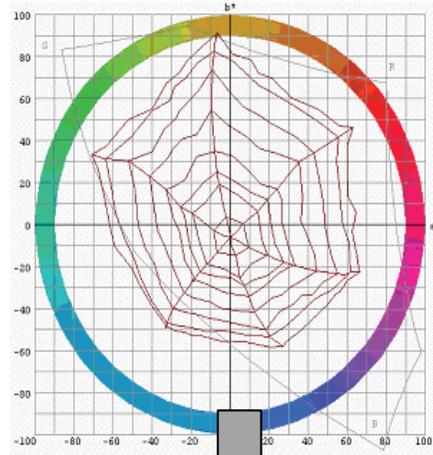
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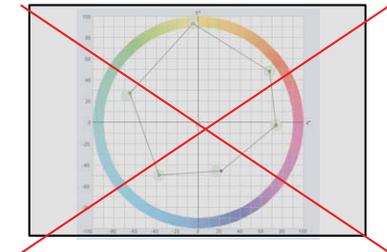
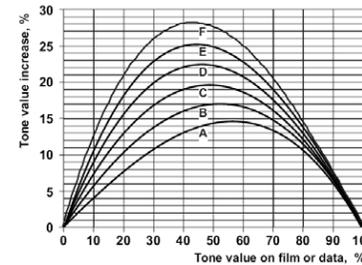
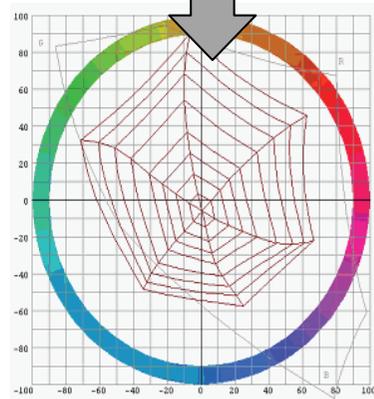
Averaging / Correction

Adjustment of:
TVI
Solids

FOGRA1



FOGRA11



FOGRA27

FOGRA39

12647-2:2007

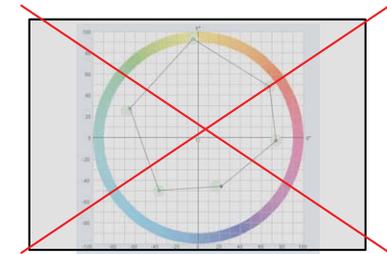
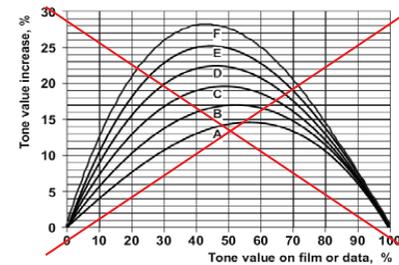
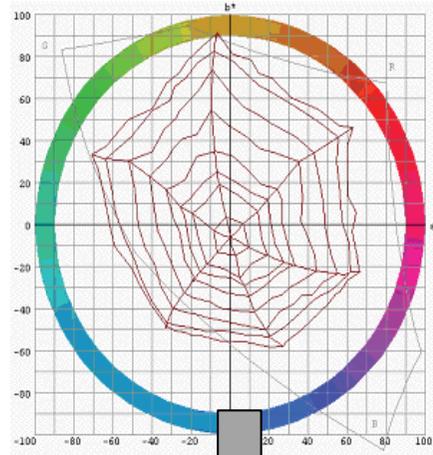
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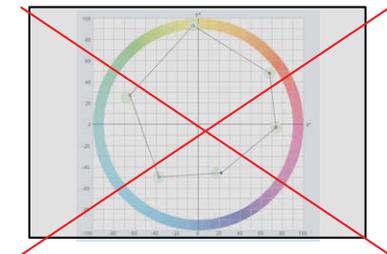
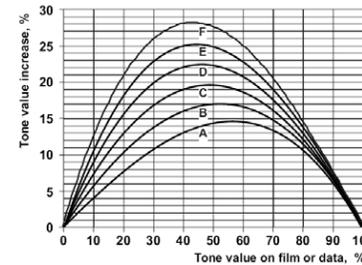
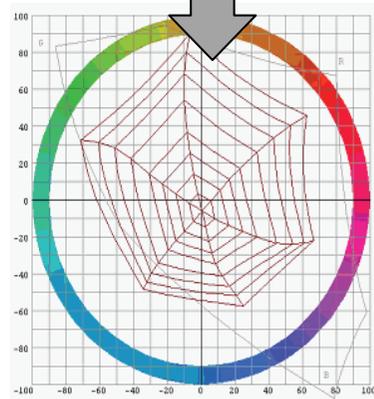
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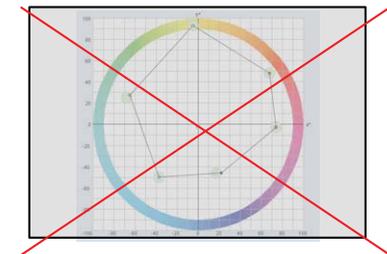
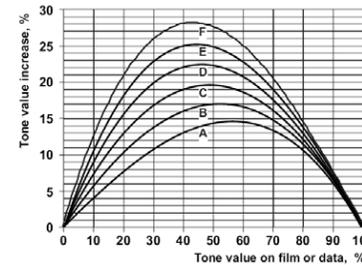
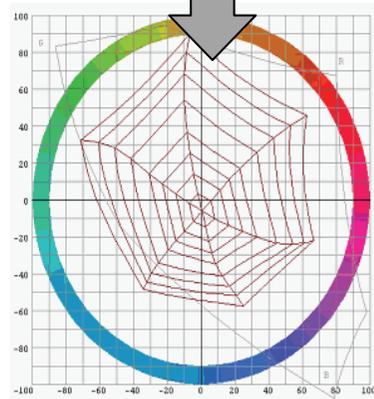
FOGRA1



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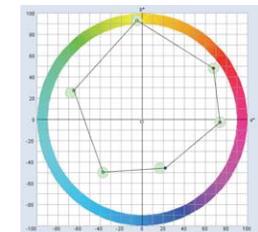
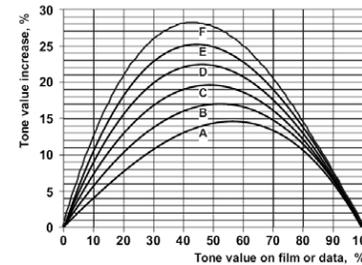
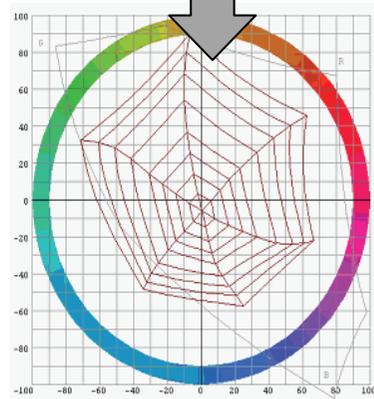


FOGRA27



FOGRA39

12647-2:2007



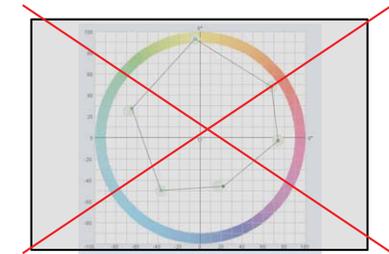
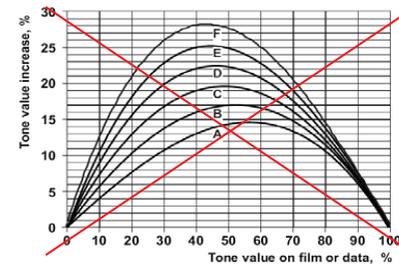
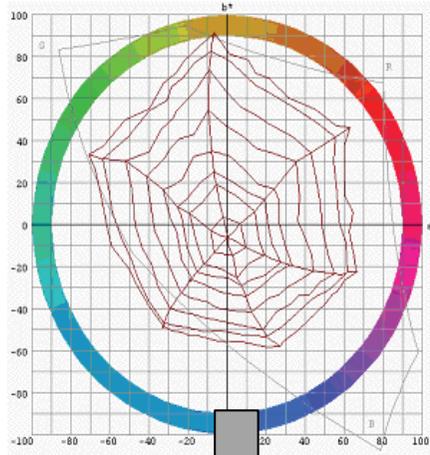
t

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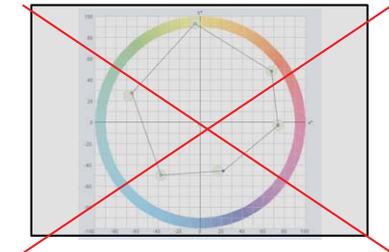
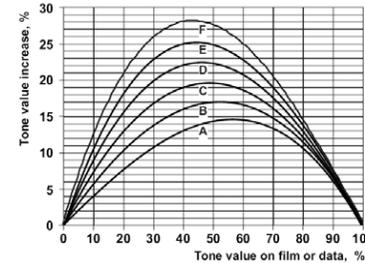
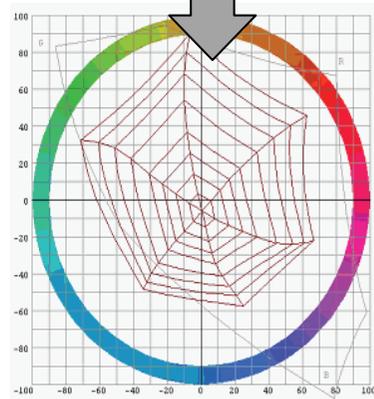
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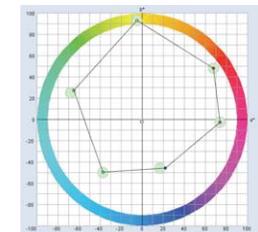
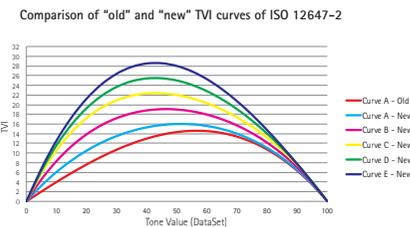
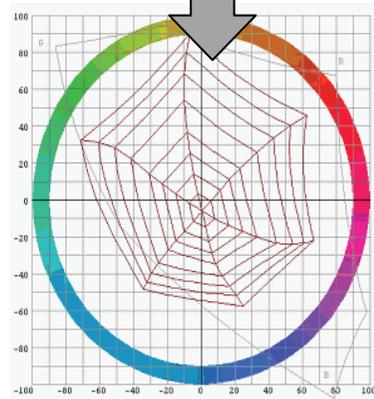


FOGRA27

t

FOGRA39

12647-2:2007



FOGRA51/F52  *PSO amendment*
12647-2:2013

2. A role model in PSO implementation



The screenshot shows a web browser window displaying the Siemens website. The address bar shows the URL http://www.automation.siemens.com/_en/pso/index.htm. The page header includes the Siemens logo and navigation links for 'International', 'Deutsch', and 'Sitemap'. A search bar is visible on the right side. The main content area features a large image of a printing press and a document. Below the image, the text reads:

Offset printing process standard

- Siemens controls the complete production process - from conception through the final artwork up to release for printing. The interaction with numerous photographers, agencies, pre-press companies and printing companies must be carefully organized and coordinated.
- A constant quality can only be reached by creating transparency in the various operating phases therefore resulting in fast and reliable production with few fluctuations.
- By applying the offset printing process standard [ProzessStandardOffsetdruck], a predictable color rendition can be achieved and therefore controlled in a specific fashion. Siemens has defined specifications and tolerances in its production guidelines.

Initial situation

- In the past, proofs and data were supplied from the lithography company to the printing company. It was not possible to check whether the proofs had the correct color rendition.
- We had color fluctuations between the various editions.
- The Siemens petrol looked different on the various brochures.

A large red watermark reading www.siemens.com/PSO is overlaid diagonally across the bottom right portion of the screenshot.

2. PSO certification since 2004



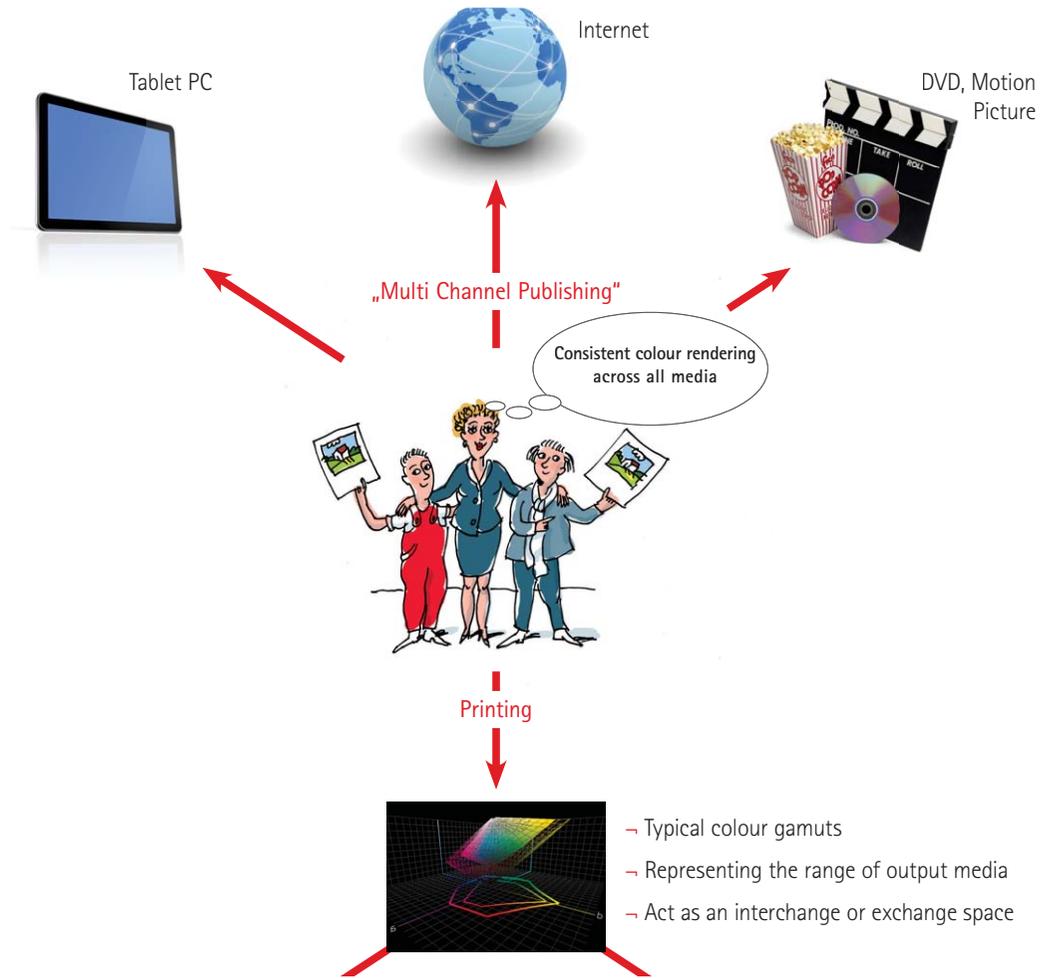
ProcessStandard Offset
Production within a qualified production chain

The ProcessStandard Offset
Advantages of the PSO
Certification
Support & Services
Costs
Utilities
Downloads/Links
Contact person
Certified companies

Starlite Holding Limited
31 Tai Yau Street, Sanpokong
Kowloon, Hongkong
Contact:
Telephone: +852 3403 1111
Facsimile: +852 2352 3928
Email: info@starlite.com
Domain: www.starlite.com
[Google Maps](#)
Information:
Revenue:
Numbers of staff:
Certification agencies:
Production: 07/2016
Start of production: 07/2016

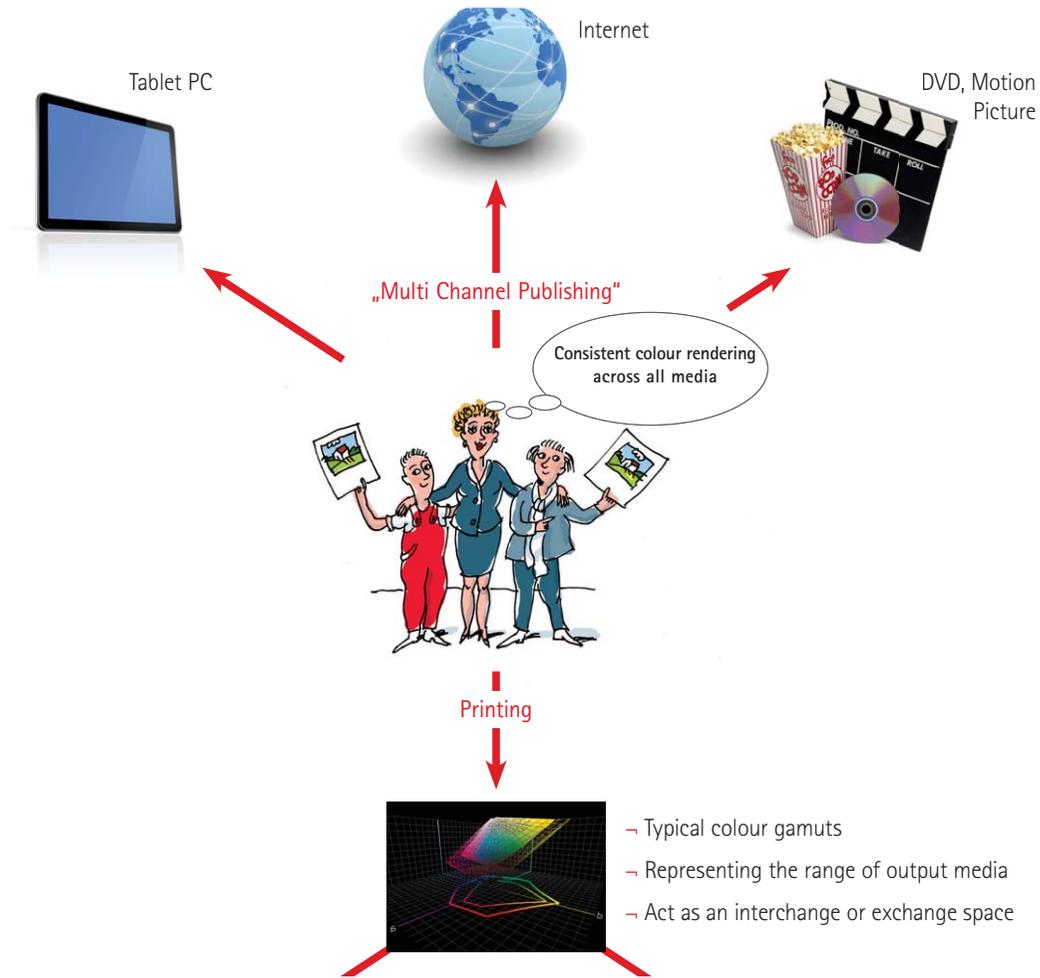
Best Practice ISO 12647
Optimisation of Printing Processes – ISO 12647
Benefits of Application and Further Development of Standard Printing Conditions –
Experiences, Best Practices of European Printing Companies (DPA, Graessle, Digital Printing)

3. How about digital printing?



Conventional Commercial Printing PSO

3. How about digital printing?



Conventional Commercial Printing
PSO

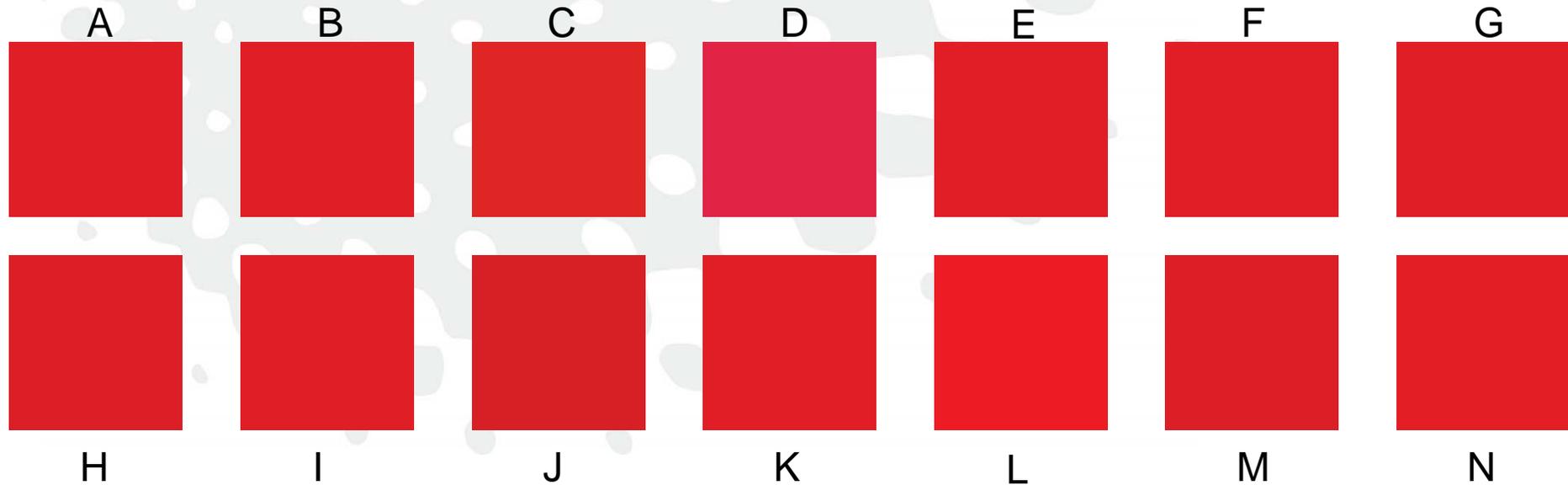
Digital Production Printing
PSD

3. Remember this colour



3. Pick a colour

What colour do you pick?



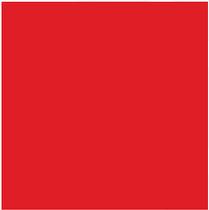
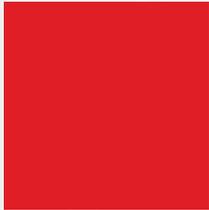
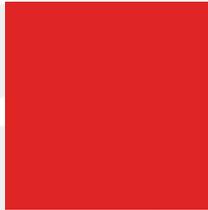
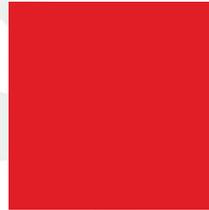
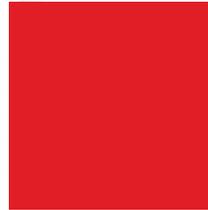
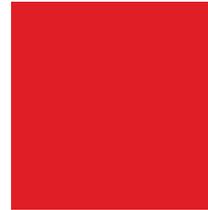
A	B	C	D	E	F	G
H	I	J	K	L	M	N

3. Pick a colour

correct answer: K

What colour do you pick?



A	B	C	D	E	F	G
						
H	I	J	K	L	M	N
						



3. One hotel category for all?



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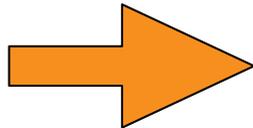
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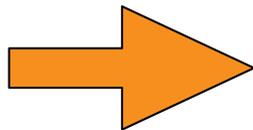
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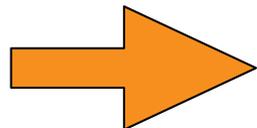
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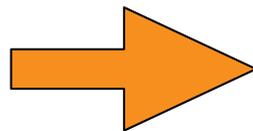
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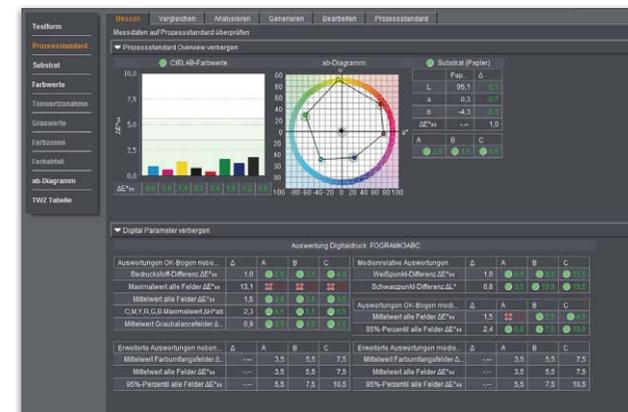


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Heidelberg ColorTool Report



3. PSD Conformance levels

	Colour Accuracy (closeness of match)																	
Use Cases	Side-by-Side			Media Relative														
	A	B	C	A	B	C												
commercial printing																		
semi-commercial printing																		
newspaper like printing																		
	<div style="border: 1px solid black; padding: 5px;"> <p>→ Tolerances:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #fff9c4;">Patches in digital printing form</th> <th style="background-color: #fff9c4;">Quality Type C</th> <th style="background-color: #fff9c4;">Quality Type B</th> <th style="background-color: #fff9c4;">Quality Type A</th> </tr> </thead> <tbody> <tr> <td style="background-color: #fff9c4;">All Patches</td> <td style="background-color: #fff9c4;">Average $\Delta E_{00}^* < 6.5$ 95% Quantile $\Delta E_{00}^* < 8.5$</td> <td style="background-color: #fff9c4;">Average $\Delta E_{00}^* < 4.5$ 95% Quantile $\Delta E_{00}^* < 6.5$</td> <td style="background-color: #fff9c4;">Average $\Delta E_{00}^* < 2.5$ 95% Quantile $\Delta E_{00}^* < 4.5$</td> </tr> <tr> <td style="background-color: #fff9c4;">Grey Balance patches</td> <td style="background-color: #fff9c4;">Maximum $\Delta C_h \leq 4.5$</td> <td style="background-color: #fff9c4;">Maximum $\Delta C_h \leq 3.5$</td> <td style="background-color: #fff9c4;">Maximum $\Delta C_h \leq 2.5$</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">* ΔC_h is explained in chapter 2.3.</p> <p>→ There is no media-relative evaluation for the reproduction of spot colours.</p> </div>						Patches in digital printing form	Quality Type C	Quality Type B	Quality Type A	All Patches	Average $\Delta E_{00}^* < 6.5$ 95% Quantile $\Delta E_{00}^* < 8.5$	Average $\Delta E_{00}^* < 4.5$ 95% Quantile $\Delta E_{00}^* < 6.5$	Average $\Delta E_{00}^* < 2.5$ 95% Quantile $\Delta E_{00}^* < 4.5$	Grey Balance patches	Maximum $\Delta C_h \leq 4.5$	Maximum $\Delta C_h \leq 3.5$	Maximum $\Delta C_h \leq 2.5$
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PSD 2016	Visual Inspection																	
Future	Measurements (M-Score, L-Score, P-Score etc) for different use cases ...																	

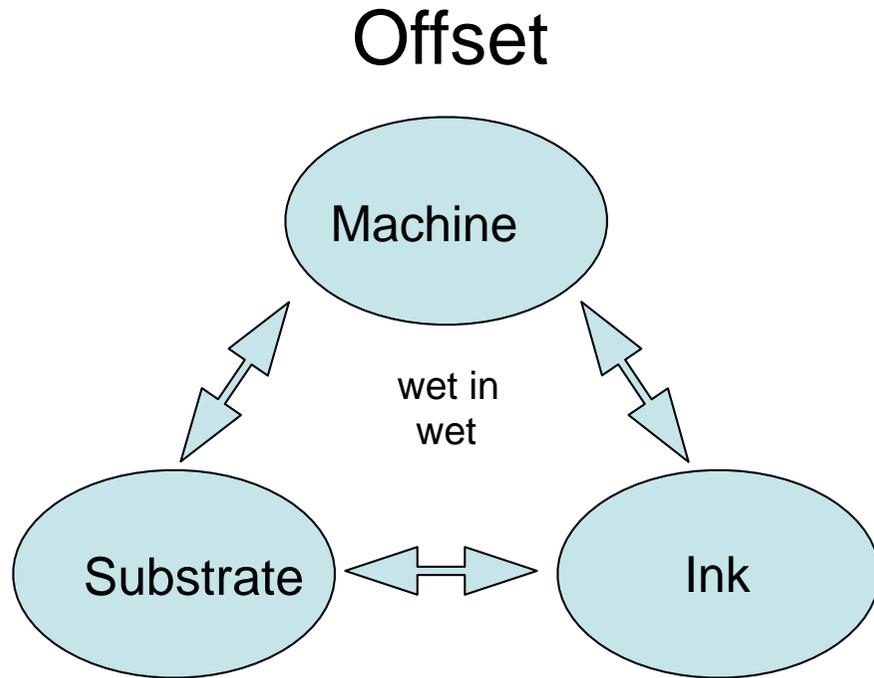
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semi-commercial printing	→ Reproduction of Spot Colours: <table border="1"> <thead> <tr> <th></th> <th>Quality Type C</th> <th>Quality Type B</th> <th>Quality Type A</th> </tr> </thead> <tbody> <tr> <td>Maximum colour difference</td> <td>$\Delta E_{00}^* < 5.5$</td> <td>$\Delta E_{00}^* < 3.5$</td> <td>$\Delta E_{00}^* < 2.5$</td> </tr> </tbody> </table>				Quality Type C	Quality Type B	Quality Type A	Maximum colour difference	$\Delta E_{00}^* < 5.5$	$\Delta E_{00}^* < 3.5$	$\Delta E_{00}^* < 2.5$																							
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newspaper like printing																																		
Image Quality (uniformity, resolution etc)																																		
PSD 2016	Visual Inspection																																	
Future	Measurements (M-Score, L-Score, P-Score etc) for different use cases ...																																	



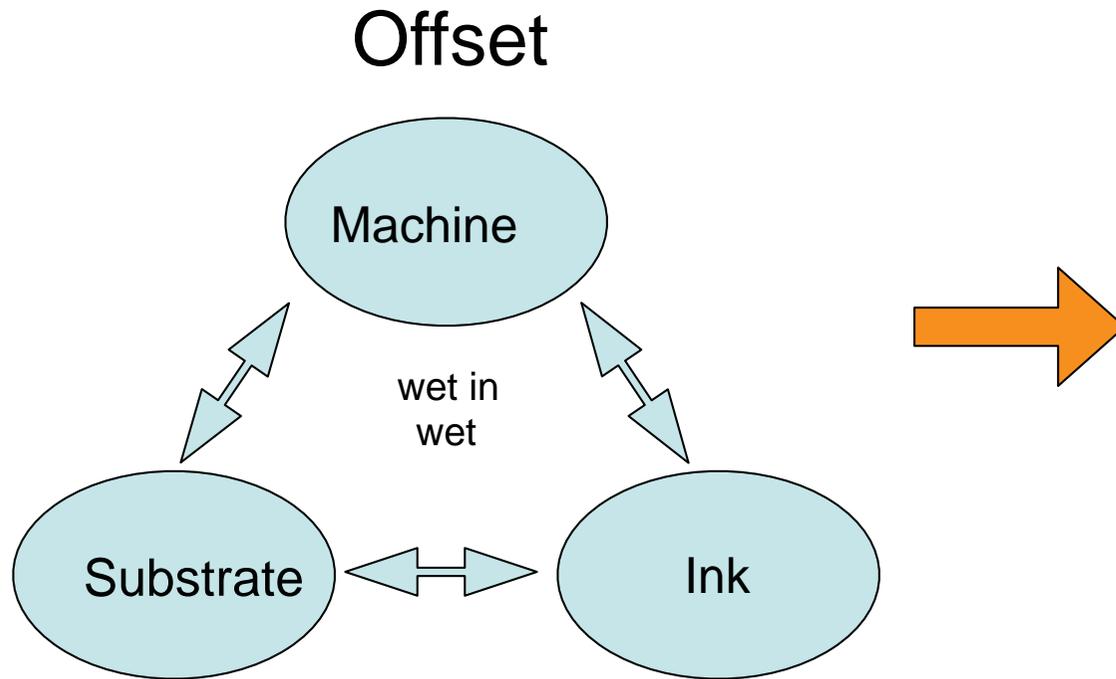
3. Printing Conditions for digital printing?

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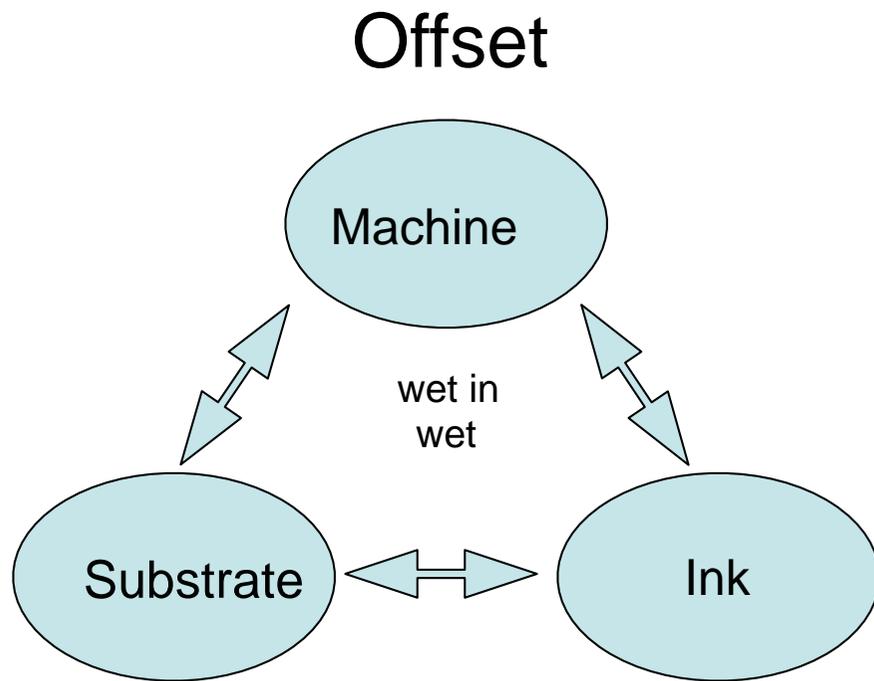
Complex but mostly known
behaviour of components and their
interplay ⇒ separable ⇒
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3. Printing Conditions for digital printing?

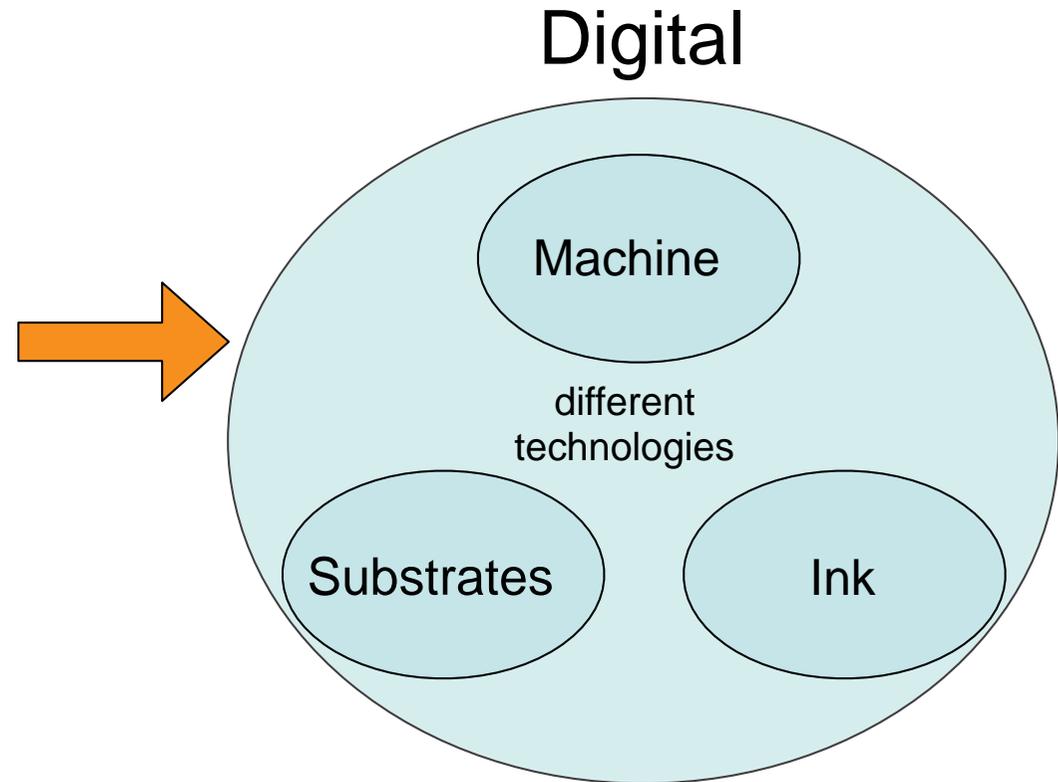


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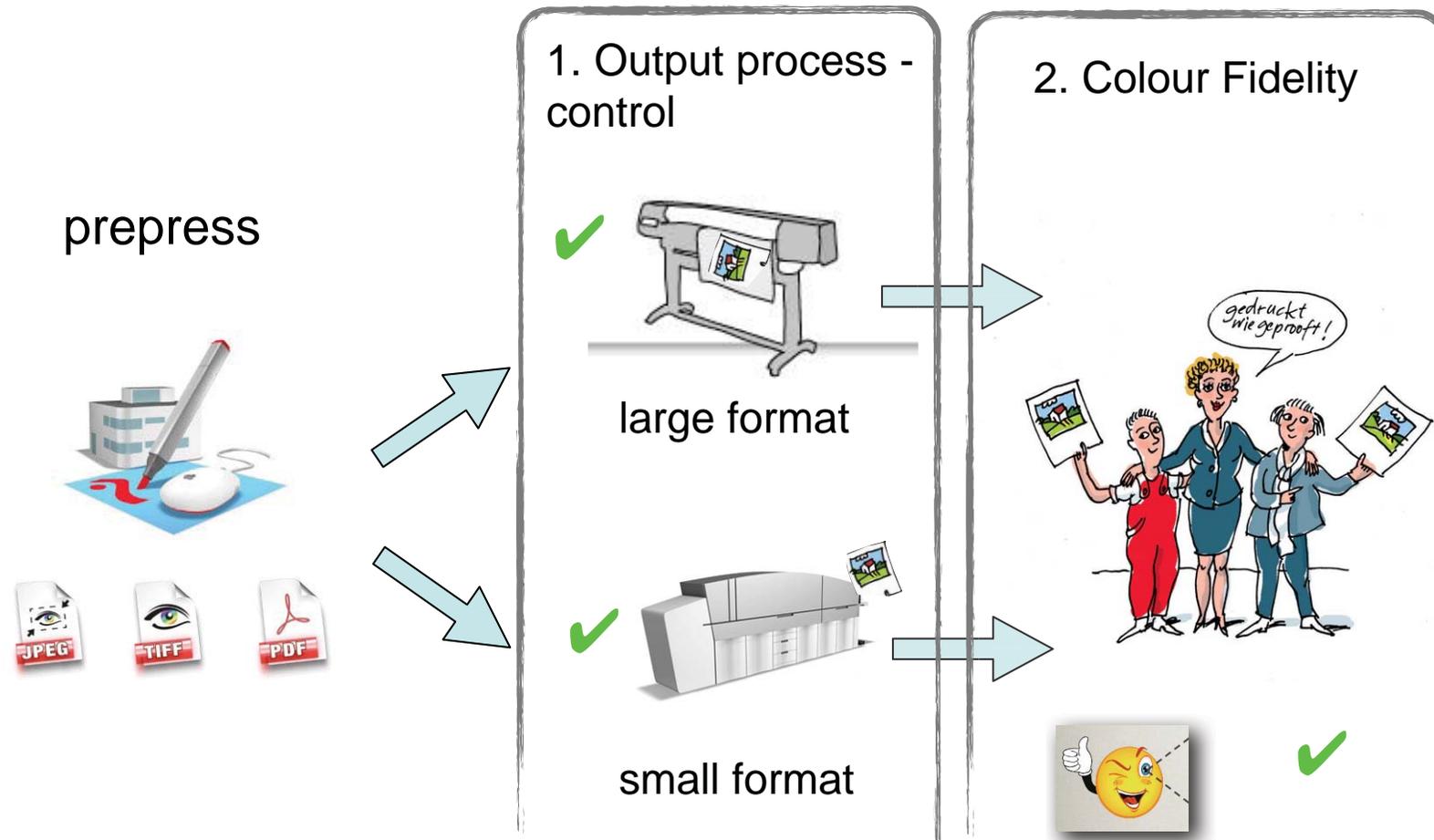


Complex but mostly known
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Highly integrated systems.
⇒ Define Combinations
⇒ Define expected outcome

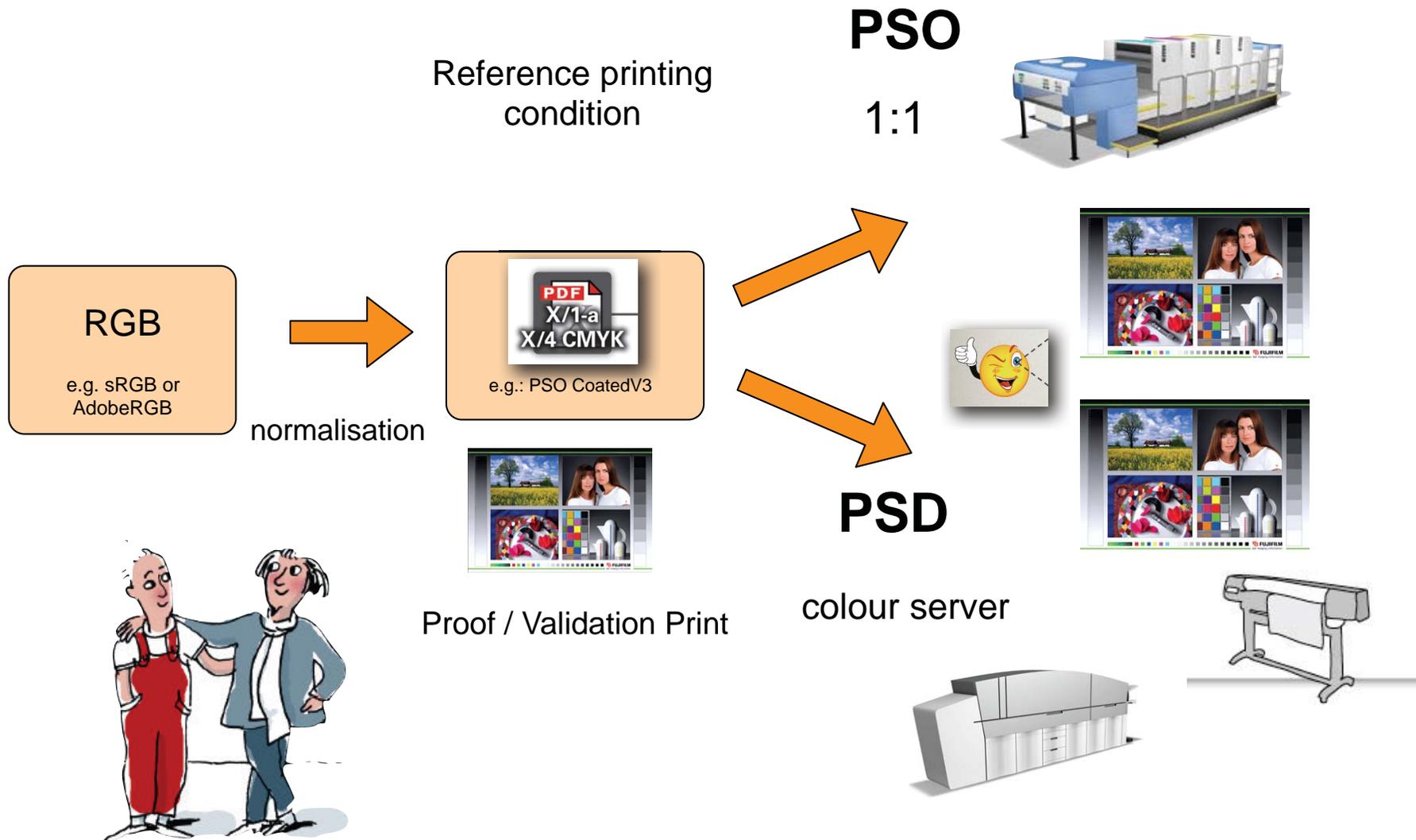
3. The three PSD aims



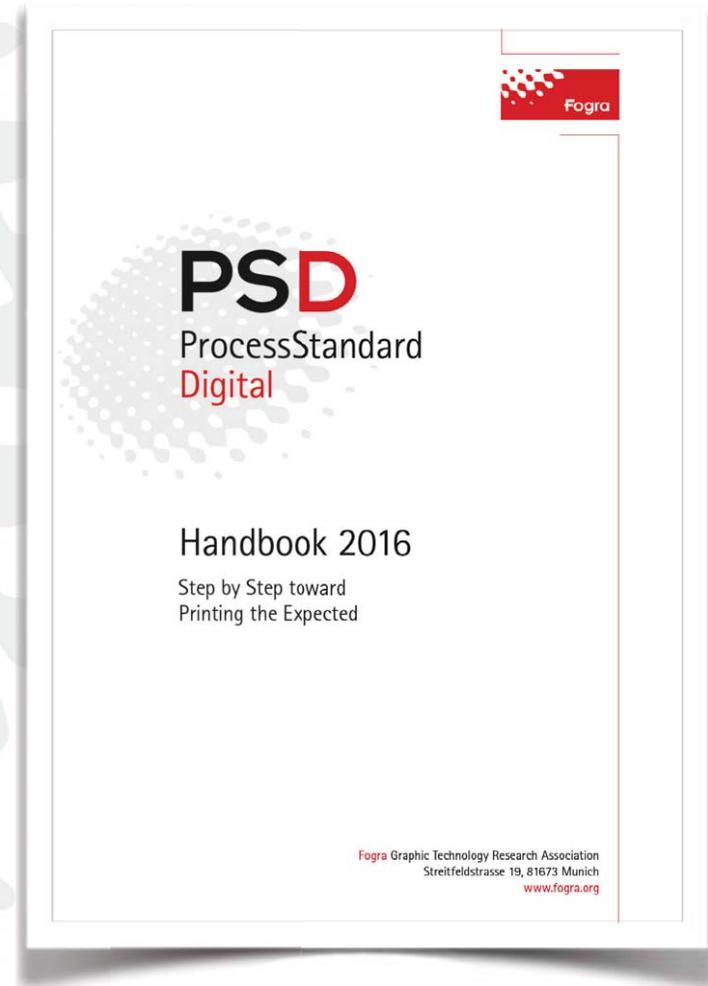
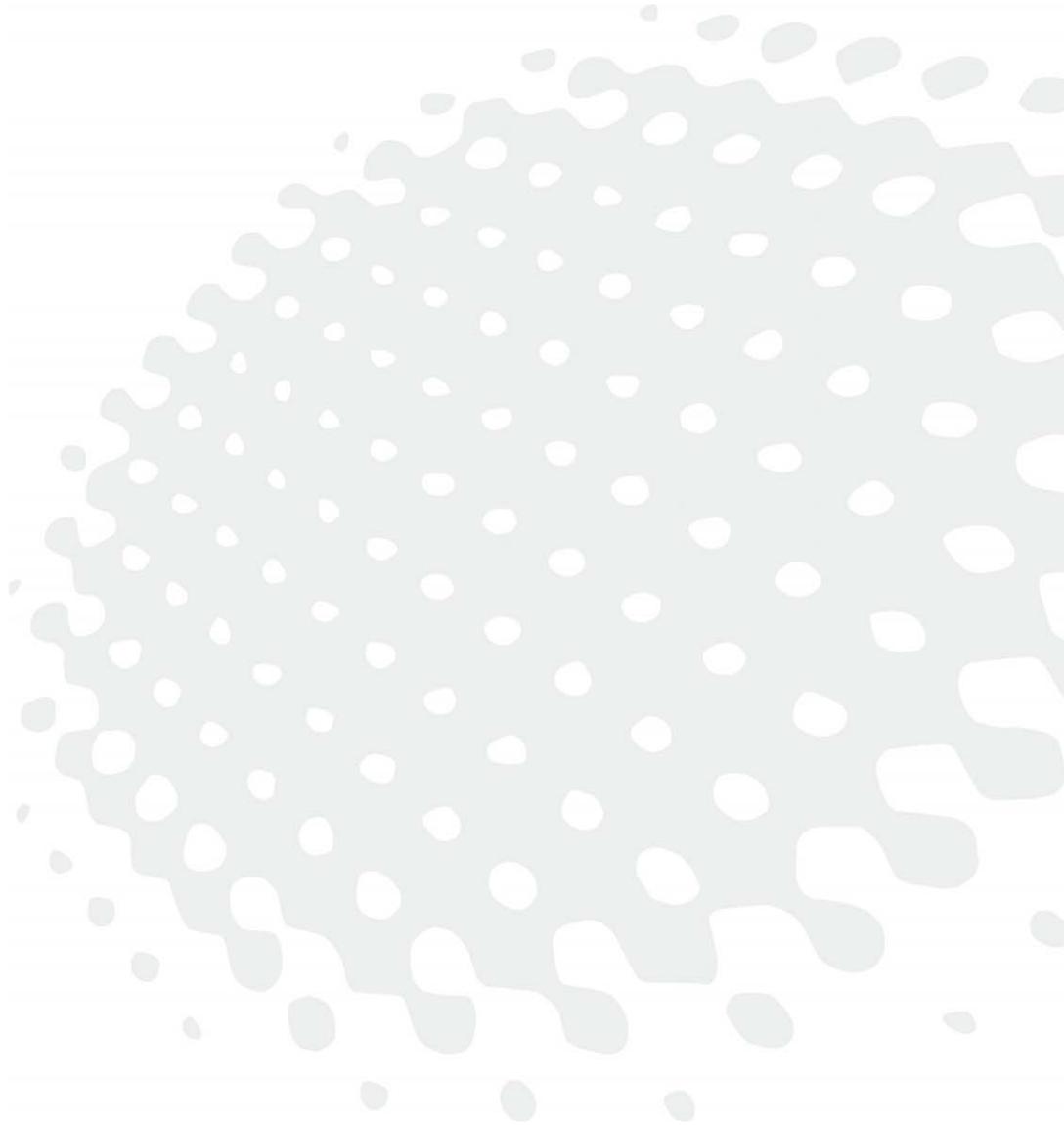
3. Workflow

- ✓ Preflight
- ✓ PDF/X-Output
- ✓ Profile-handling
- ✓ PDF/X-Creation
- ✓ Altona Test Suite V1 & V2
- ✓ Light-Audit

3. Concept of PSD - Matching Offset included

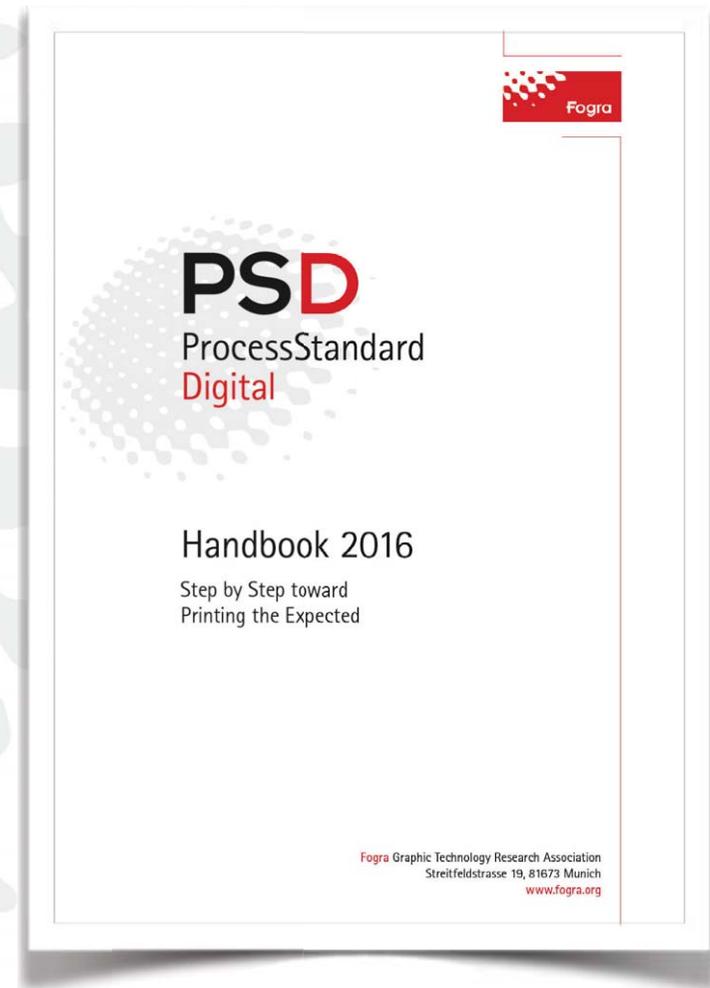


3. PSD meets the digital challenges



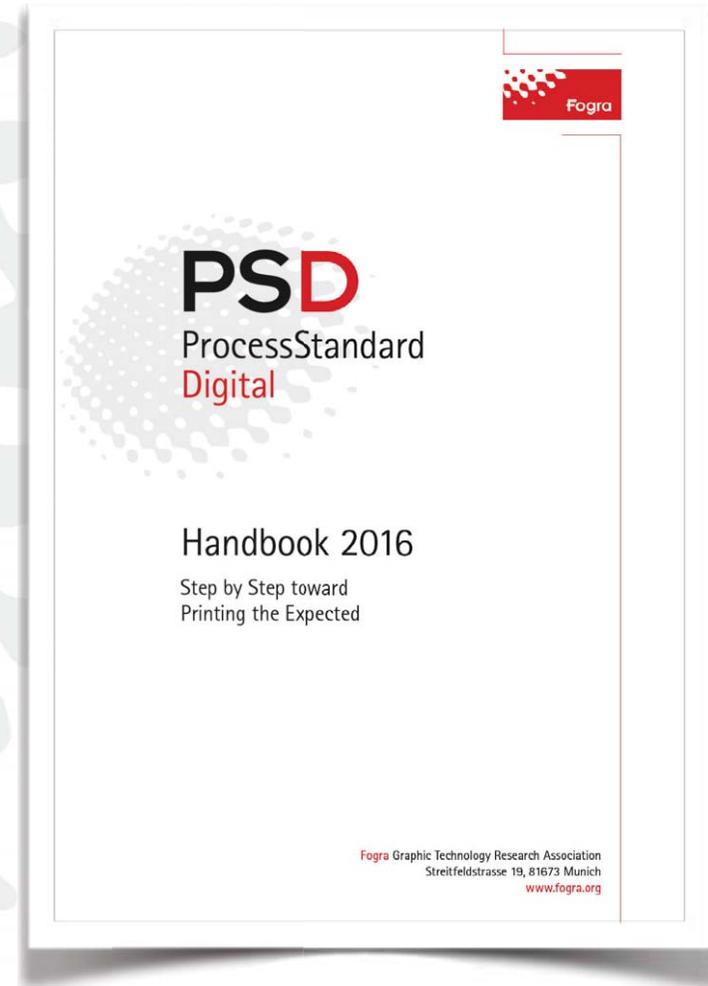
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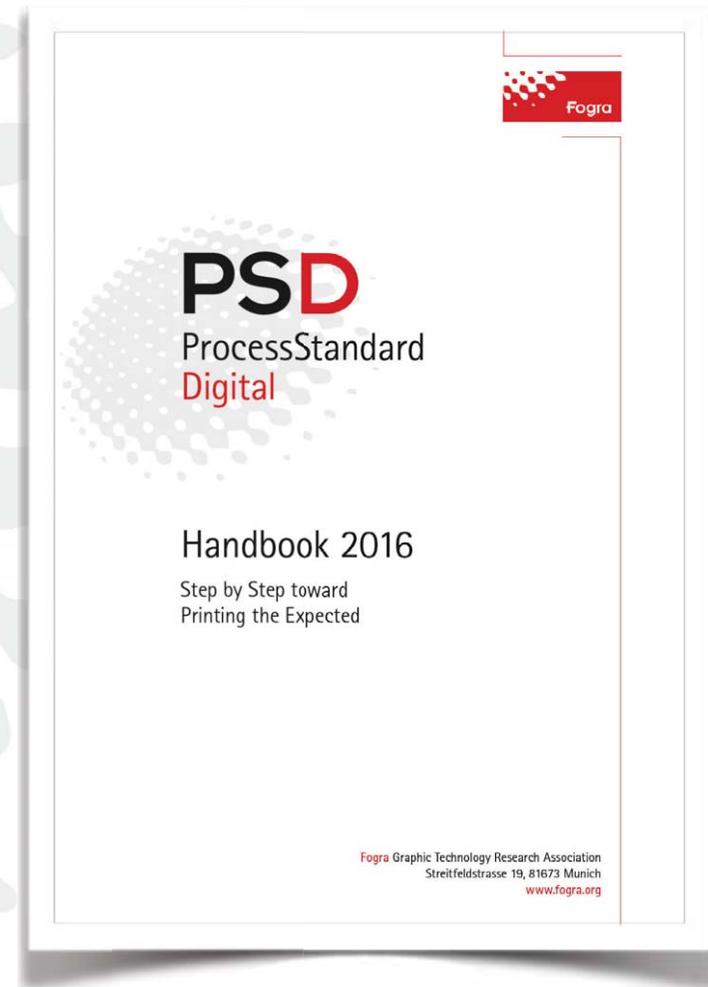
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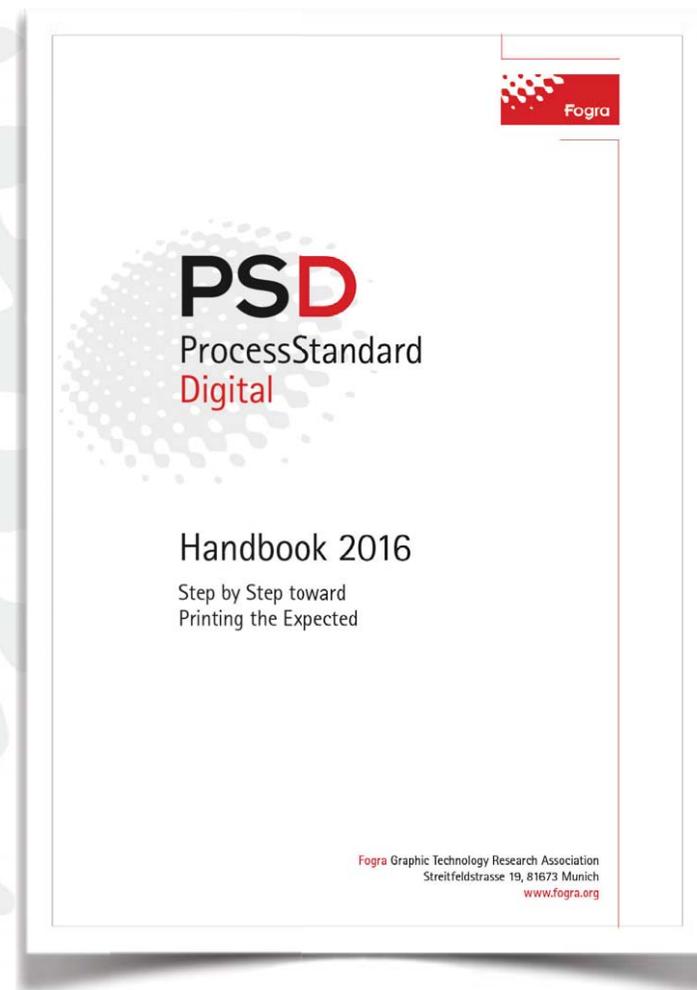
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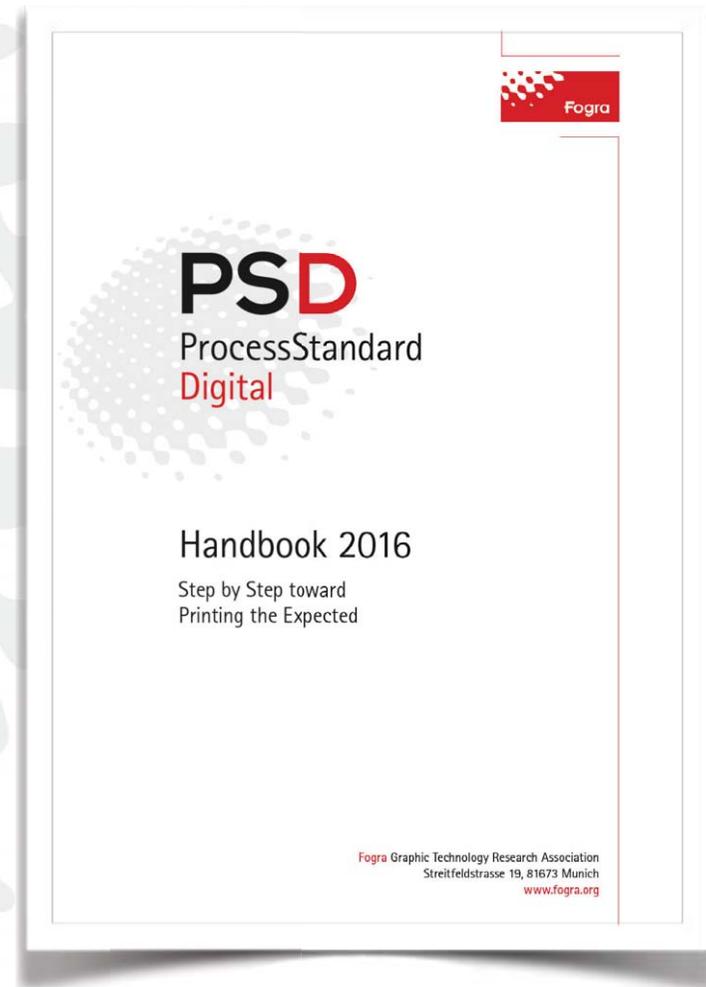
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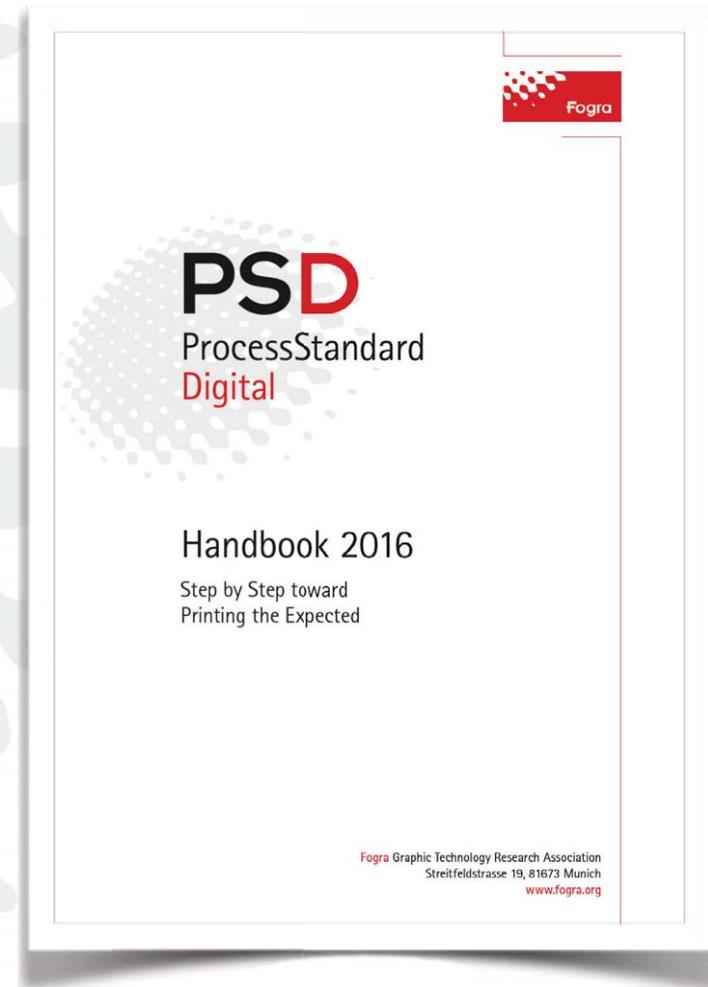
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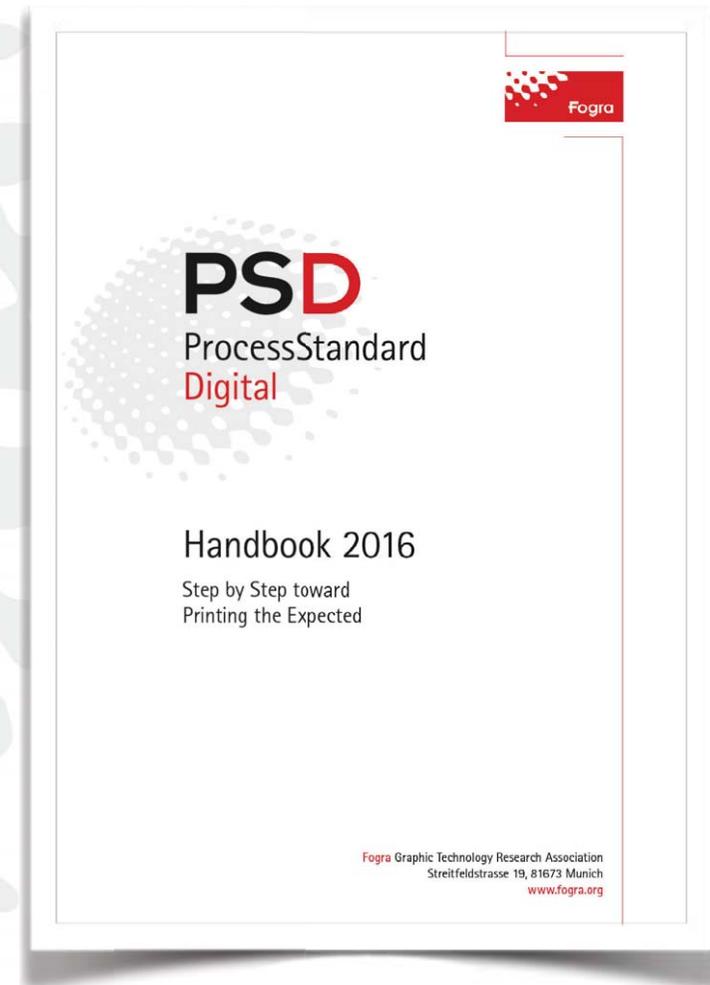
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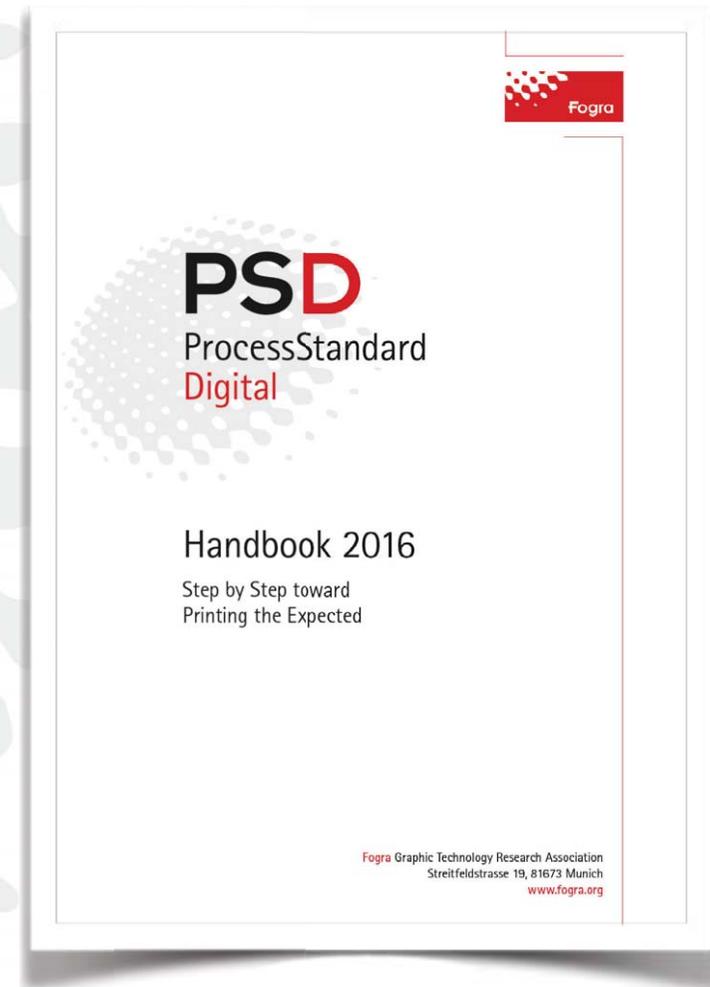
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 - Process agnostic approach
- PSD defines clear aims for a digital print run (PSD Print Check)





4. FograCert ecosystem - testing PSO & PSD

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Manufacturer

⇒ *Ability of a system*

service providers

⇒ *Ability to create ...*

For end users

⇒ *Conformance*

day to day practice

4. FograCert ecosystem - testing PSO & PSD

Design Print

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Validation Printing System | 99999

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MediaStandard
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ProcessStandard
Digital (PSD)

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Design Print

Offset printing

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MediaStandard
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Offset
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Machine
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MediaStandard
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Digital (PSD)

PSO -

Conformance check



ISO 12647-2



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ProcessStandard
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Digital
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ISO 12647-2



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Contract Proofing System | 99999

VersaFire



Offset printing

Machine acceptance test

Digital Printing

System Check - 15311

service providers

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Validation Print Creation | 99999



Contract Proof Creation | 99999



For end users

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day to day practice



PSO - Conformance check



ISO 12647-2

MediaStandard Print (MSP)

ProcessStandard Digital (PSD)



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Validation Printing System | 99999



Contract Proofing System | 99999

VersaFire



Offset printing

Machine acceptance test



Digital Printing

System Check - 15311



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ISO 12647-2

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PSO - Conformance check



ISO 12647-2

Print Check (PSD)

MediaStandard Print (MSP)

ProcessStandard Digital (PSD)

4. PSD certification pays off



VFXTM **WINS**
Australia's 1st
Fogra PSD
certification with a
global twist!
See more on our **PRINT** page



“This is particularly exciting for digital printing of large and grand format projects. Due to PSD we got the pitch for printing all collaterals for both the 2016 commonwealth games and the Asian Cup”.

Bill Apostolidis, General Manager at VFX



5. Resume

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„When you can measure what you are speaking about and express it in numbers, you know something about it“

Lord W. T. Kelvin, Lecture to the Institution of Civil engineers, London, 3 May 1883

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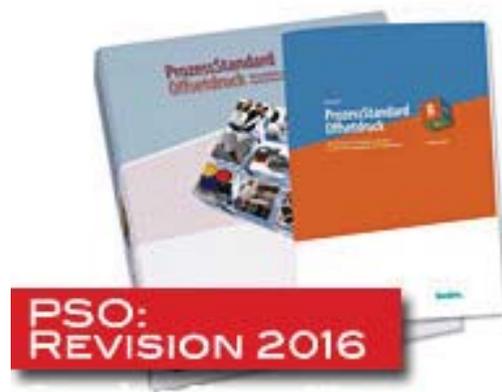
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Save the Date

