

A large, faint, light gray fingerprint graphic is centered in the background of the slide.

Proof certification according to ISO 12647-7 and a proposal for a new evaluation [CIEDE2000]

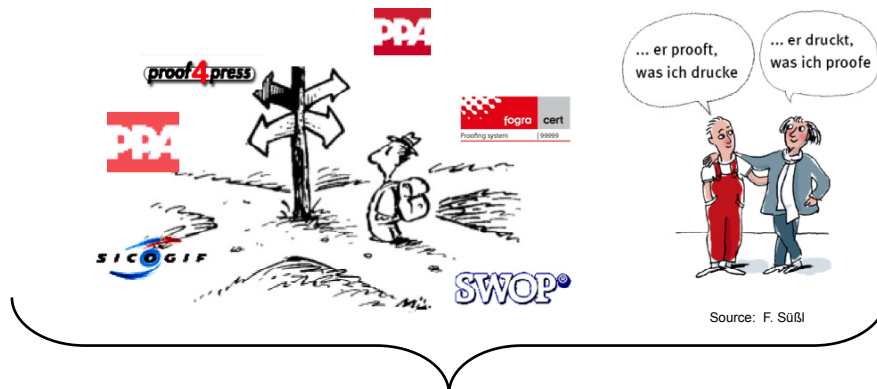
Results from the AiF research project Nr. 60.054

Agenda



1. ISO 12647-7 : Proofing - process agnostic
2. Usage of modern colour difference formulas
3. FograCert - for PSR V2
4. Outview

1. The history of ISO 12647-7



ISO 12647-7

Internationally agreed upon criteria allow for a fair and global competition.

1. Basics of Standardization

„Standardisierung ... soll als eine einheitliche Festlegung von Herstellungsverfahren, Prüfverfahren und Werkstofftypen, von Kennzeichnungen und verschiedenen Hilfsmitteln im Betrieb verstanden werden. Eine Standardisierung darf nicht willkürlich vorgenommen werden, sondern sie muss sich aus den Erfahrungen der Praxis entwickeln, dem neuesten Stand der Technik entsprechen und wissenschaftlich einwandfrei sein.“

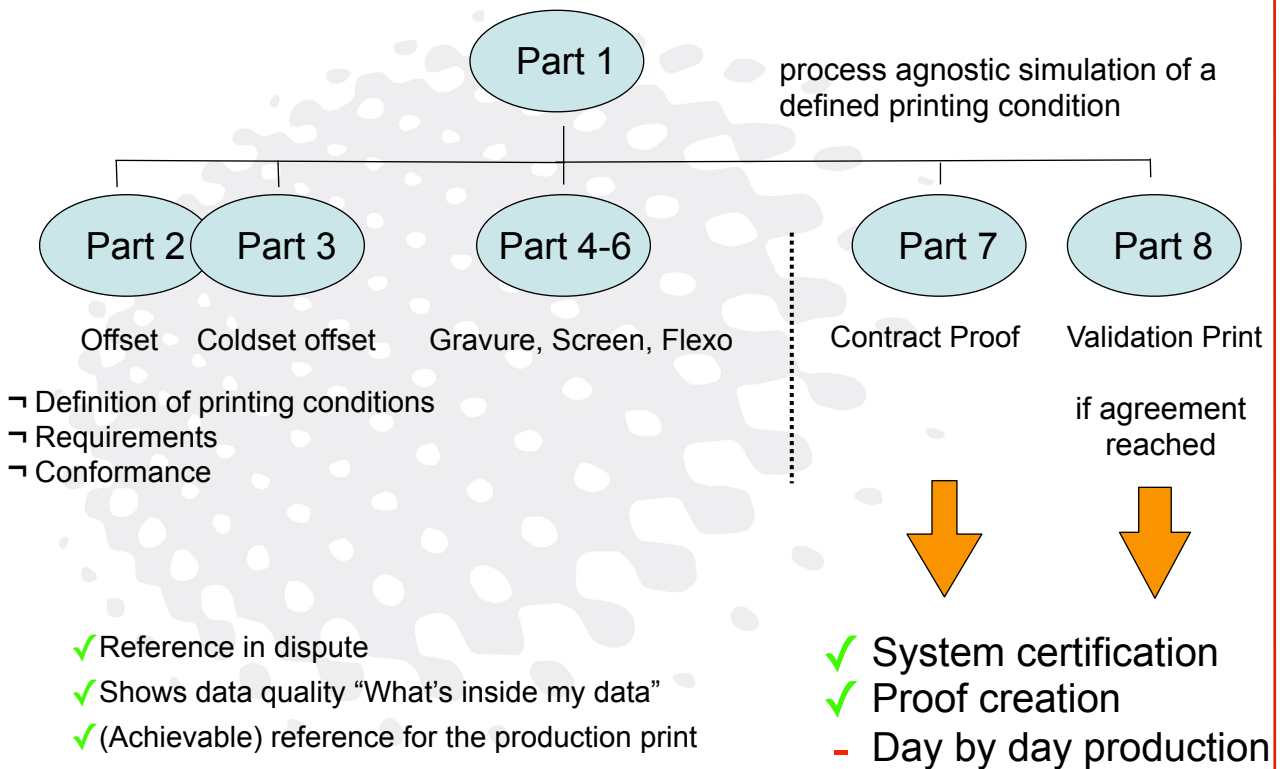
K.-H. Schirmer, Fogra Mitteilungen 38, 1963, S.13

Wish for
small
tolerances

Technical
Realizability



1. ISO 12647-x - an overview



1. Anforderungen ISO 12647-7

Proofing System

- Substrate [Colour, Gloss, Aging, Light fastness]
- Colour accuracy, colour gamut, grey balance, fading
- Homogeneity
- Repeatability [1h und 24h]
- Rubbing [Rub resistance]
- Tone value reproduction
- Rendition of smooth vignettes
- Registration power

Intended audience:

Manufacturer of entire systems

Contract Proof Creation

- Substrate [Colour and Gloss]
- Colour accuracy, colour gamut, grey balance
- Homogeneity
- Tone value reproduction
- Rendition of smooth vignettes
- Registration power

Proof provider

1. The colour accuracy requirements



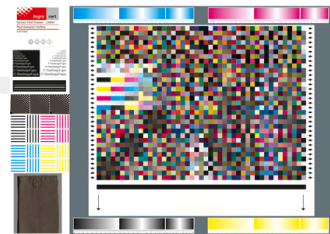
ugra/Fogra media wedge V. 3

Colour accuracy

	ΔE Paper	ΔE Max	ΔE Primaries	ΔE average	ΔH comp. grey	ΔH Primaries
Proof CIELAB 1976	3	6	5	≤ 3	$\leq 1,5$	$\leq 2,5$

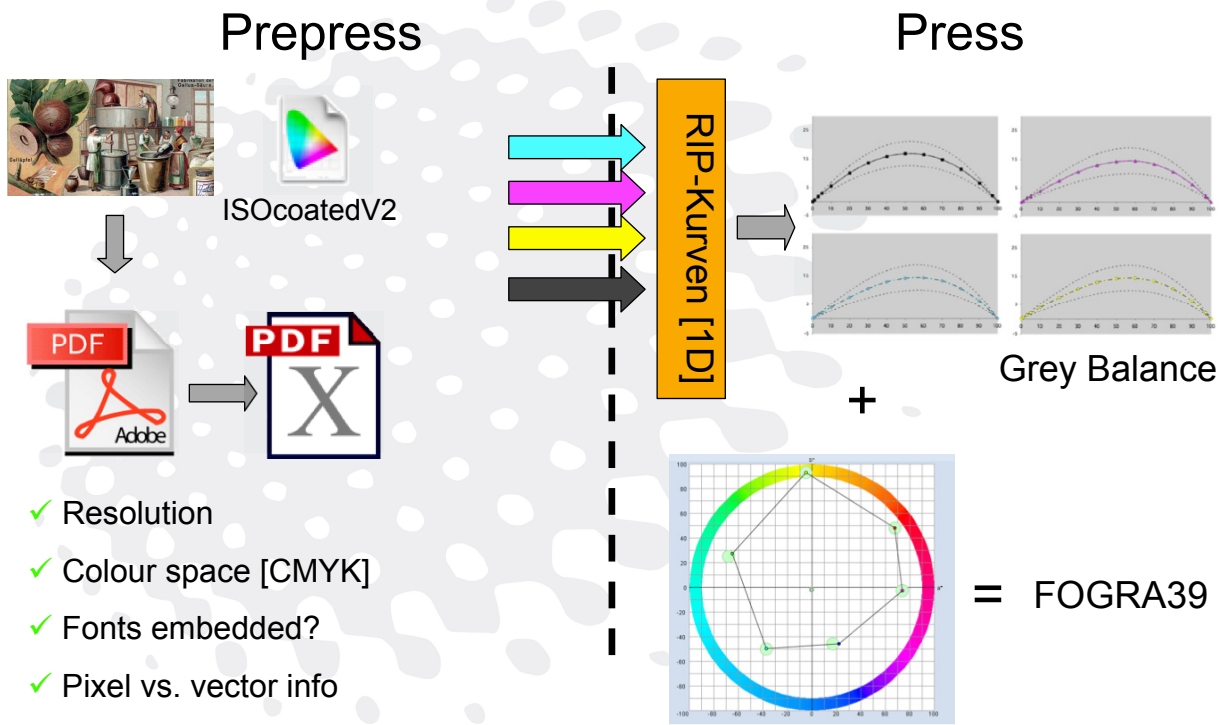
Colour accuracy: ISO 12642 [ECI2002]

	ΔE Gamut	ΔE Average	ΔE 95% Quantile
Proof CIELAB 1976	4	4	6

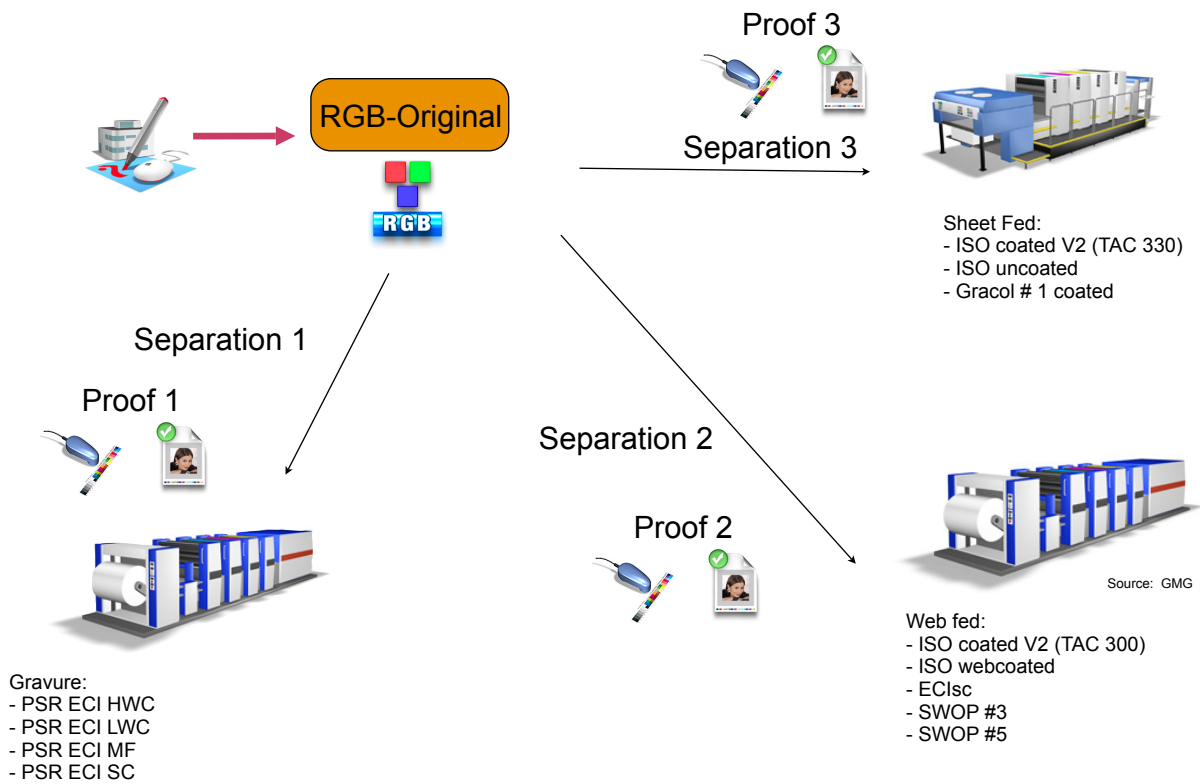


ISO 12647-7 Evaluation Test form

1. In a perfect world....



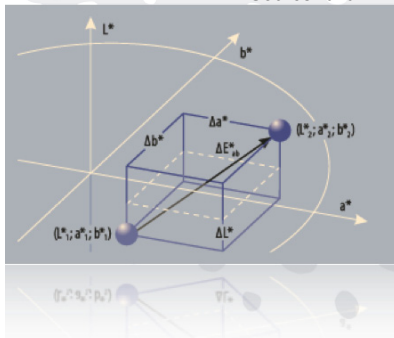
1. ...the separation is depending on the output



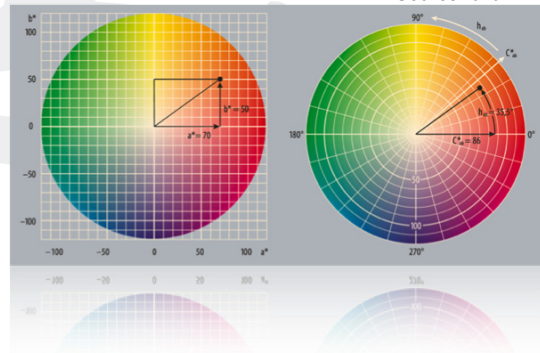
2. Usage of modern colour difference formulas

- simple euclidean distances (CIELAB 1976)
- Weighting of difference components (CMC, CIEDE94, CIEDE2000, Lübbe-Formel etc.)
- Transformation into a new space (DIN99, CIECAM02)
- euclidesation of existing formulas (Urban 2007)

Source: bvdM



Source: bvdM



2. “Modern values” for standardization

Toleranz	Cyan	Magenta	Gelb	Schwarz
Vorgabe Aktuell (CIELAB 1976)	4	4	4	5
CIEDE2000	2,7	2,4	1,0	3,5
DIN99o	2,9	2,9	1,2	5,5
Vorgabe „Alt“ (CIELAB 1976)	2	2,5	4	3
CIEDE2000	1,2	1,4	0,9	2,1
DIN99o	1,4	1,6	1,0	3,3

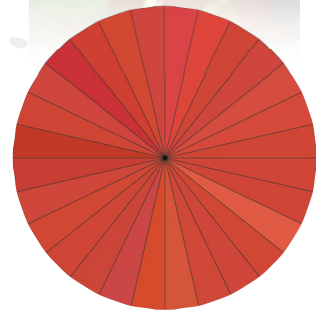
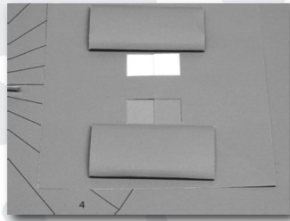
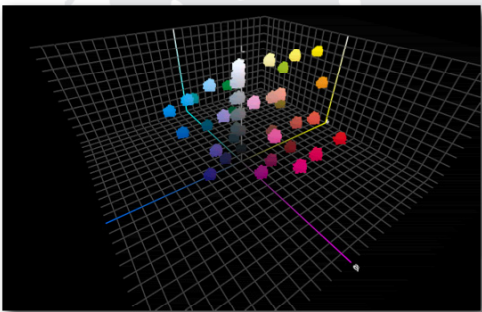
Calculation of the variation tolerance using CIEDE2000 and DIN99o both for the current (“Aktuell”) and old tolerances (“Alt”).

2. Participate at further experiments:

“Fogra roses”

- 46 colour patches of the media wedge [F39]
- each 28 (+X) Colour neighbors
- each 3 grey reference pairs
- 20 observer (Experiment will be continued)

= 77280 observations



Colour center: Red

2. Results of the research project

- Differentiate between technical and perceptual uniform tolerance
 - *technical tolerance*: quantitative Evaluation of typical production process [Correlation is mostly linear]
 - Recommendation: Focus on simple communication means
 - * *perceptual uniform*: colour difference should mimic what we perceive (see)
 - * Recommendation: usage of CIEDE2000 (1,1,1) [a little better than DIN99]
- CIELAB very good for definition of colour (colour measurement)
- Visual appraisal of complex images is still a active field of research

2. When do we see CIEDE2000 in daily life?

- We use it already for expert opinions and certifications [in addition to 1976 CIELAB]
- As of June 2009 all FograCert Contract Proof Creation + Validation Print Creation comprise CIEDE2000 tolerances **informatively**
- CIDE2000 is defined in ISO 13655 since 2000
- The transition will last time and will progress smoothly
- Replacement of “technical tolerances” with CIEDE2000 benefits in better understanding of the implicit deviations
- Revision of ISO 12647-7 will be based on CIEDE2000. This won't be before 2010.

3. FograCert: for PSR V2

There is no “The Fogra-Certification”



Creation



Proofing



Printing machine

Scrutinies

- CtP-Press Acceptance
- PSO-certification
- Machine acceptance

Additional Testing

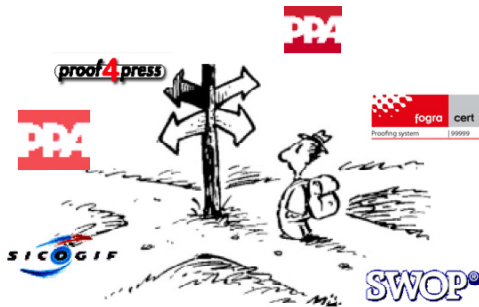
- General Acceptance tests
- Material-Tests [washes, dampening solutions]

FograCert - Materials

- Ink Colour
- Inkjet foto paper
- Ghosting in sheet fed
- Optical properties

3. Contract Proof Creation - Web

- Criteria reflect ISO 12647-7 100%
- Additional [informative] Evaluation are doable
- Basic Law: First ISO then implementation
- Remember:



The screenshot shows the FograCert Prüfproz website interface. The header includes the 'fogra' logo and navigation tabs for HOME, MATERIALS, MACHINES, PROCESSES, and EXPERTISES. The main content area displays search results for 'Contract Proof Creation' with the following details:

- Contract Proof Creation**
- Certified companies**
- Validation Print Creation**
- PDF/X Creation**
- PDF/X Output**
- PSO**
- White backing [info]**
- Test forms**

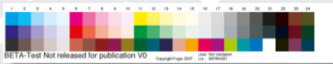
The search results are sorted by **Printing condition Country Zipcode Certification**. The results are as follows:

Company	Printing condition	Country	Zipcode	Certification
Publicis Group Austria GmbH	IFRA	Austria	1040 Wien	FograCert Contract Proof Creation
X-FILES		Austria	4020 Linz	FograCert Contract Proof Creation
Layoutsatz 2000 GmbH & Co. KG		Deutschland	80797 München	FograCert Contract Proof Creation

3. How to facilitate an updated evaluation?

	ΔE	MedienStandard Druck 2006		ISO 12647-7 / MSD2007	
		Proof OK?	Max	Max	Proof OK?
Bedruckstoff	0,0	Proof OK	3	3	Proof OK
Mittelwert	0,0	Proof OK	4	3	Proof OK
Maximalwert	0,0	Proof OK	10	6	Proof OK
Primärfarben	0,0	Proof OK	5	5	Proof OK
Primärfarben (Buntton)	0,0	nicht zutreffend		2,5	Proof OK
Buntgrau (Mittelwert)	0,0	nicht zutreffend		1,5	Proof OK

	ΔE Paper	ΔE Max	ΔE Primaries	ΔE Average	ΔH Comp. Grey	ΔH Primaries
Proof	≤ 3	≤ 6	≤ 5	≤ 3	$\leq 1,5$	$\leq 2,5$
CIELAB 1976	66,9	-24,7	37,1	66,86	-24,73	-37,10
	75,7	12,5	24,0	75,73	12,53	24,00



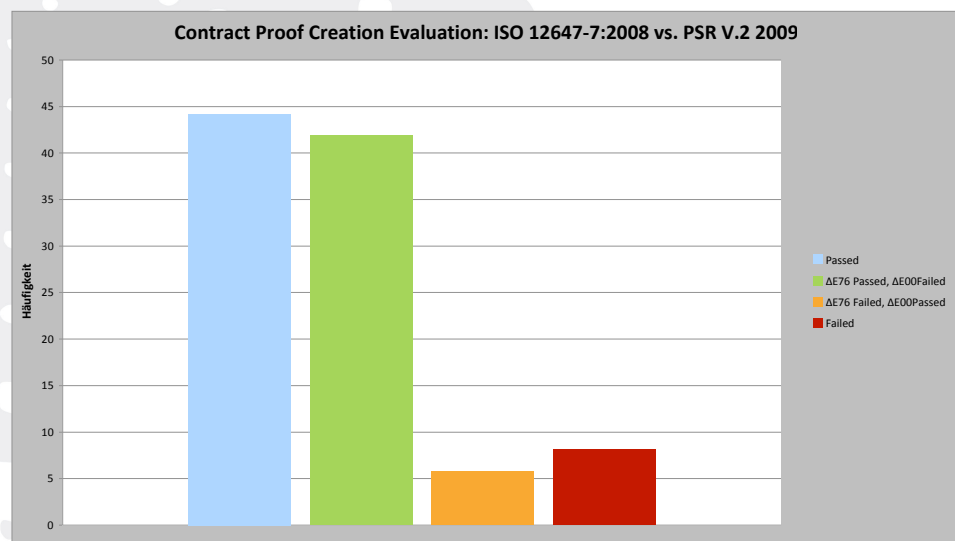
	ΔE Paper	ΔE Average	ΔE Max
ECI WG Gravure CIEDE2000	$\leq 1,5$	$\leq 1,5$	$\leq 2,5$

+

	ΔE 98 % Quantile
ECI WG Gravure CIEDE2000	$\leq 2,5$

3. How much tighter are those criteria?

Statistic of the certifications in 2009:



3. What Fogra can do?

System certification
+
Proofcreation

- Add those criteria informatively
- Communication via website “*”
- “*” *the system additional conforms to the informative criteria related to ECI PSR V2.*

Colour reliability keeps as is but we might discuss to implement this into a new revision of the media standard print.

3. Don't miss

