THE PAPERDAM GROUP
Expertise in Paper Performance

Standardisation update and Paperdam group

PPA's Paper Profile working group
11th of February 2011
London

Jouni Marttila / Sappi Fine Paper Europe
Gerd Carl / UPM
Luc Lanat / StoraEnso

Paperdam

- In 2008 group of people from different European paper manufacturers gathered to discuss ISO 12647-2 and especially the role of paper in standardization

- First meetings took place at IGT office in Amsterdam thus
  - PAPER manufacturers meeting at AmsterDAM = Paperdam

- Paperdam is open for all paper manufaturers

- Check: www.paperdam.org

Paperdam members

Company	Members	TC 130 member
Burgo	Alessandra Bogliano	
Holmen	Jan Andersson	
IGT	Wilco de Groot	Yes
Lecta	Juan Font	
Myllykoski	Gallus Hossli	Yes
Norske Skog	Hans-Jörg Drenk	
Sappi	Jouni Marttila Jozie Dahlmans	Yes Yes
SCA	Marcus Edbom	
Stora Enso	Luc Lanat (Convenor) Peter Petermann	Yes
UPM	Gerd Carl	Yes

Alphabetical by company

Competition laws!

We do not talk about:

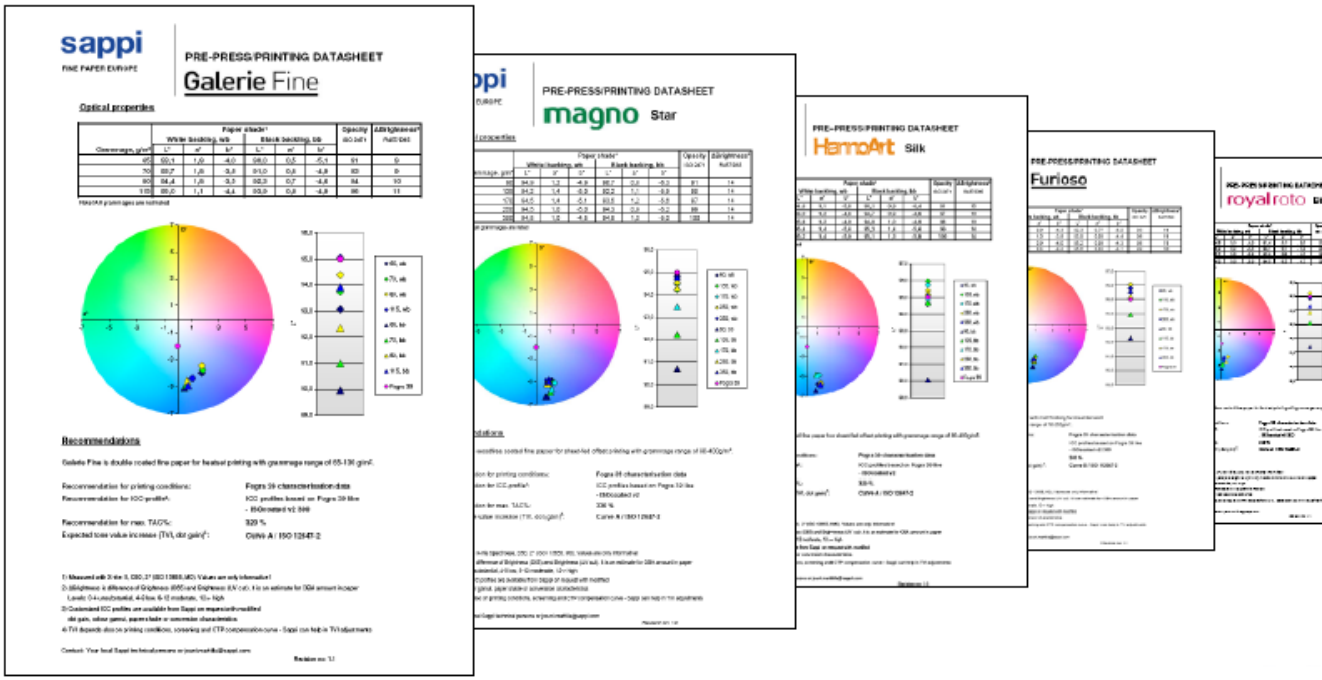
- Sales and purchase prices, including price changes or pricing policy.
- Discounts, rebates, allowances or other factors affecting sales or purchase prices.
- The commercial terms or conditions of sale or purchase.
- Production output, capacity, capacity utilization rates or changes in output, capacity or capacity utilization rates.
- Individualized sales/order figures or customer lists.
- Production, marketing, R&D or other costs.
- Investments, production, product development or marketing polices or plans.
- R&D plans or results.
- Stock levels.
- Allocation of customers.
- Sales territories.
- Market sharing.
- Sharing of sources of supply.

Paperdam - Our targets

- We try to help ISO stardardization especially from paper point of view
- Paper is important part of ISO stardardization – however paper itself should not be normative ”standardized” in printing standards (so called ISO compliency)
  - Please see Paperdam ISO compliant paper statement from:
    - www.paperdam.org / downloads / Paperdam_ISO_compliant_position_2010-01-07.pdf
- We try to promote communication of paper properties and printing standardization
  - ISO TC 130/ NWI 15397 proposal: "Communication of optical and surface properties of printing substrates....“
- We try to help in standardization of optical measurements of paper and print

Paper categorisation

- ***Paperdam Group*** supports the publication of recommended ICC profiles and characterisation data for each of their paper grades
- However each member decides themselves how to communicate these recommendations



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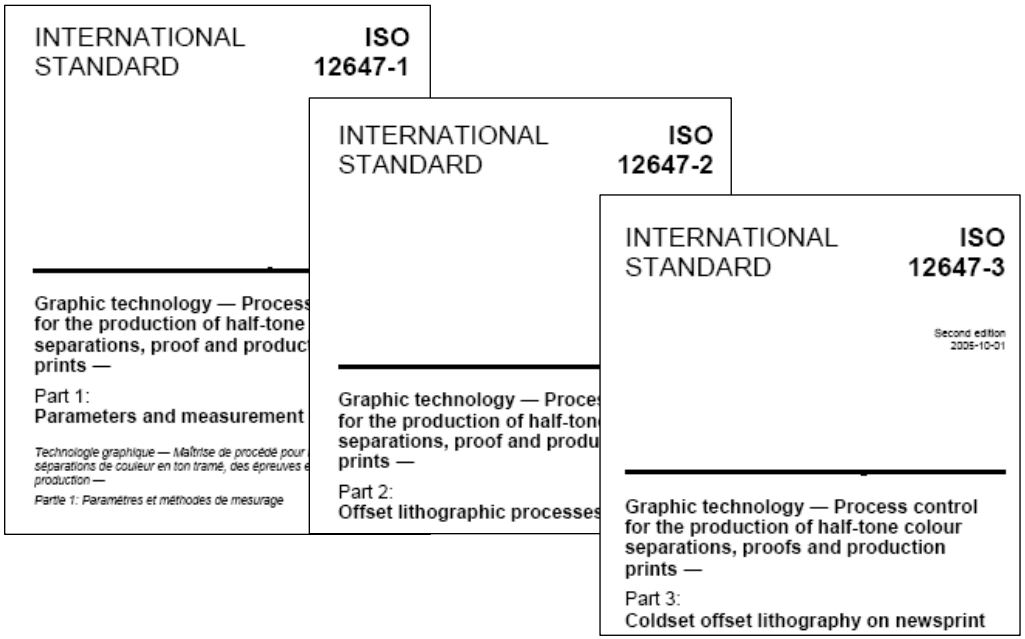
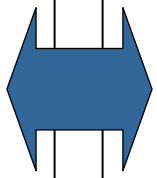
Standardisation update



Two parallel issues

Color management in world of standards

- ISO standards
  - ISO 12647-1,2,3
  - ISO 13655
  - .....
- ISO certification
- Methods to reach standards
  - PSO (Process Standard Offset)
  - G7 – North America



”Real world” colour management

- ”Standard” ICC profiles:
  - ECI ICC profiles / Fogra characterisation data
  - Gracol/SWOP ICC profiles
- Day-to-day issues reaching proof to print match

ISO 12647-2

- 1st edition published in 1996
- 2nd edition published in 2004
- Amendment to 2nd edition in 2007

1. Paper groups

Table 1 — CIELAB coordinates, gloss, ISO brightness and toler

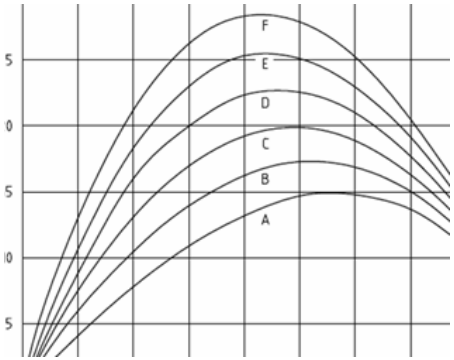
Item	Characte			
	L^{*a} 1	a^{*a} 1	b^{*a} 1	Gloss[b] %
Paper type				
1: gloss-coated, wood-free	93 (95)	0 (0)	–3 (–2)	65
2: matte-coated, wood-free	92 (94)	0 (0)	–3 (–2)	38
3: gloss-coated, web	87 (92)	–1 (0))	3 (5)	55

2. Lab targets for CMYK, RGB

Table 2 — CIELAB coordinates of colours for the printing sequ

Colour	Paper type[a,b]							
	1, 2			3			4	
	Coordinates			Coordinates			Coordi	
	$L^{*b,c}$	$a^{*b,c}$	$b^{*b,c}$	$L^{*b,c}$	$a^{*b,c}$	$b^{*b,c}$	$L^{*b,c}$	a^{*}
Black	16	0	0	20	0	0	31	1
	(16)	(0)	(0)	(20)	(0)	(0)	(31)	(1
Cyan	54	–36	–49	55	–36	–44	58	–2
	(55)	(–37)	(–50)	(58)	(–38)	(–44)	(60)	(–2
Magenta	46	72	–5	46	70	–3	54	5

3. Dot gain targets



4. Tolerances for Lab, dot gain

Table 3 — CIELAB ΔE^*_{ab} tolerances for

Parameter		
	Black	Cya
Deviation tolerance	5	5
Variation tolerance[a]	4	4
[a] The contribution of the hue difference shall not exceed 2,5.		

Standard ICC profiles

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(Note! Only AM screening profiles listed)

ECI ICC-profiles	Fogra char data	ISO 12647-2, paper grades	Paper grades, general terms
ISOCoated v2 ISOCoated v2 300	Fogra 39	PT 1,2	WFC (Woodfree coated), MWC (Medium weight coated)
PSO LWC Improved	Fogra 45	-	MWC, High brightness LWC paper
PSO LWC Standard	Fogra 46	PT 3	Standard LWC paper
PSO Uncoated ISO12647	Fogra 47	PT 4	UWF (Uncoated woodfree paper)
PSO MFC paper	Fogra 41	-	MFC (machine finished coated i.e. a matt LWC)
SC paper ECI	Fogra 40	-	SC (Supercalandered uncoated paper)
PSO SNP paper	Fogra 42	-	Standard newsprint for heatset
PSO INP paper	Fogra xx	-	Improved newsprint for heatset

Developments ISO 12647

- There has been very active discussion about how to develop ISO 12647-1/2/3
- At the moment there is basically two proposals for updating the ISO 12647-1,2,3 - series

1. Updating the current version with main differencies on paper grouping (”European approach”)

2. Totally new structure based on process agnostic approach (”North American approach”

Developments ISO 12647

- Earlier 4 papergroups approach:

Table 1 — Printing conditions for typical print substrates

Printing Condition	Print Substrate Description (Table 2)	Colorant Description (Table 3)	Screening Description			
			Periodic screening		Non-periodic screening	
			TVI Curve	Frequency	TVI Curve	Spot size
PC1	High Weight Coated, typically used in sheet-fed	CD1	A	60-80 cm^{-1}	E	20 µm
PC2	Low Weight Coated, typically used in web-fed	CD2	B	48-70 cm^{-1}	E	20 µm
PC3	High Weight Uncoated typically used in sheet-fed	CD3	C	52-70 cm^{-1}	E	30µm
PC4	Low Weight Uncoated, typically used in web-fed	CD4	D	48-60 cm^{-1}	E	30µm

In case of non-periodic screening the printing conditions may be named PC1NP, ...

Developments ISO 12647

- Process agnostic approach

Gamut	Name	US Reference	European Reference
0	Extra Large	Average of digital printers	
1	PremCoated	Gracol2006_Coated1	Fogra39
2	PubCoated	SWOP2006_Coated3,5	Fogra45,46
3	SuperCal	BetaSupercal	Fogra40
4	PremUncoated	BetaOffsetUncoated	Fogra47
5	HeatsetNews	BetaHeatsetNews	Fogra42
6	ColdsetNews	SNAP2009	IFRA26

- Each data set based on different outer gamut
- Cover the whole range of printing in logical steps based on real data

Developments ISO 12647

- Paperdam proposal based on paper matrix
- Paper properties in closer focus:
  - Surface properties based on gloss and roughness
    - Impact on print density and dot gain
    - both can be combined in a surface index where gloss is higher valued
  - Paper shade:
    - L*a*b – values contain 3-dimension thus difficult to use in categorisation
    - CIE Whiteness is a good measure for the whiteness of paper with a focus on the yellow/blue axis.
- Paper industry needs a way on how to evaluate which printing condition applies to their products. The measurement methods proposed are standardised, well possible to calibrate and in use globally
- The paper matrix allows to "categorise" in order to find the right printing condition

Paper shade and whiteness

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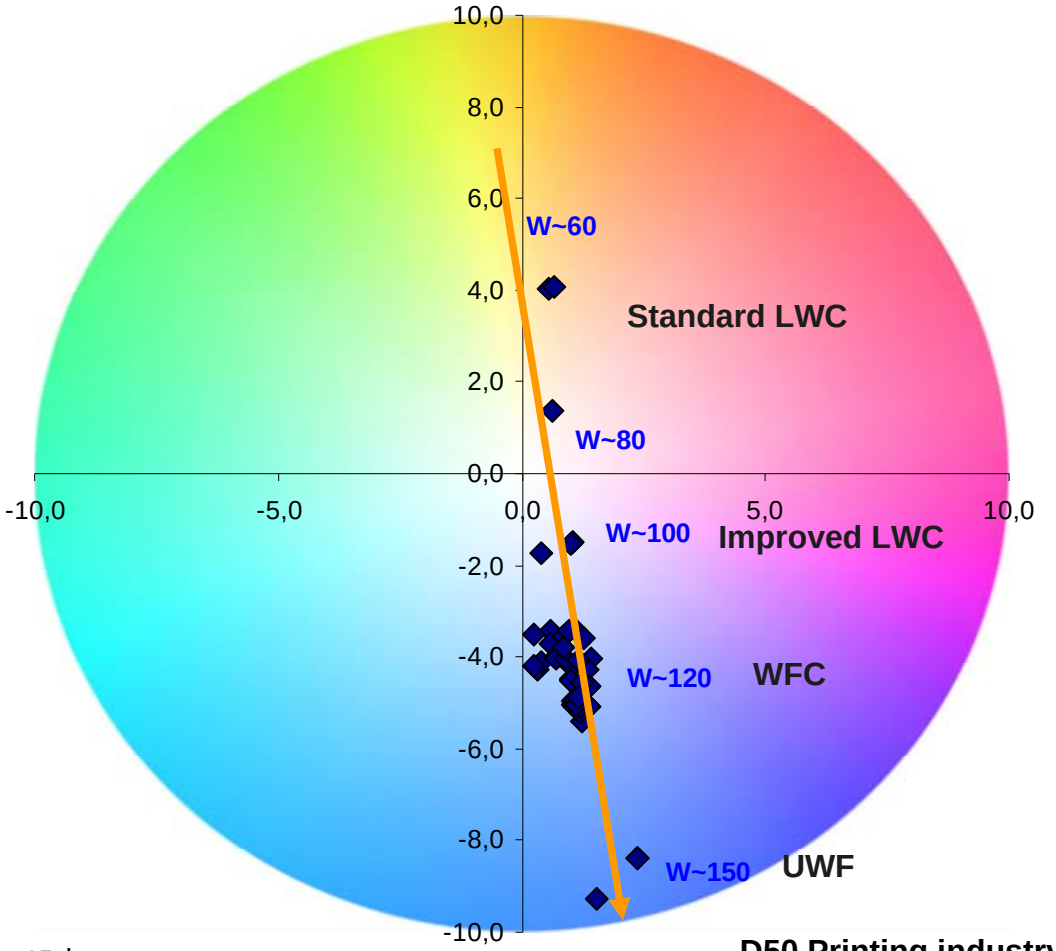

- As paper brightness increases the shade usually shifts from yellowish to bluish shade
- Whiteness is easier to use in paper categorisation than 3-dimensional L*a*b*

D50 Printing industry values (ISO 13655)

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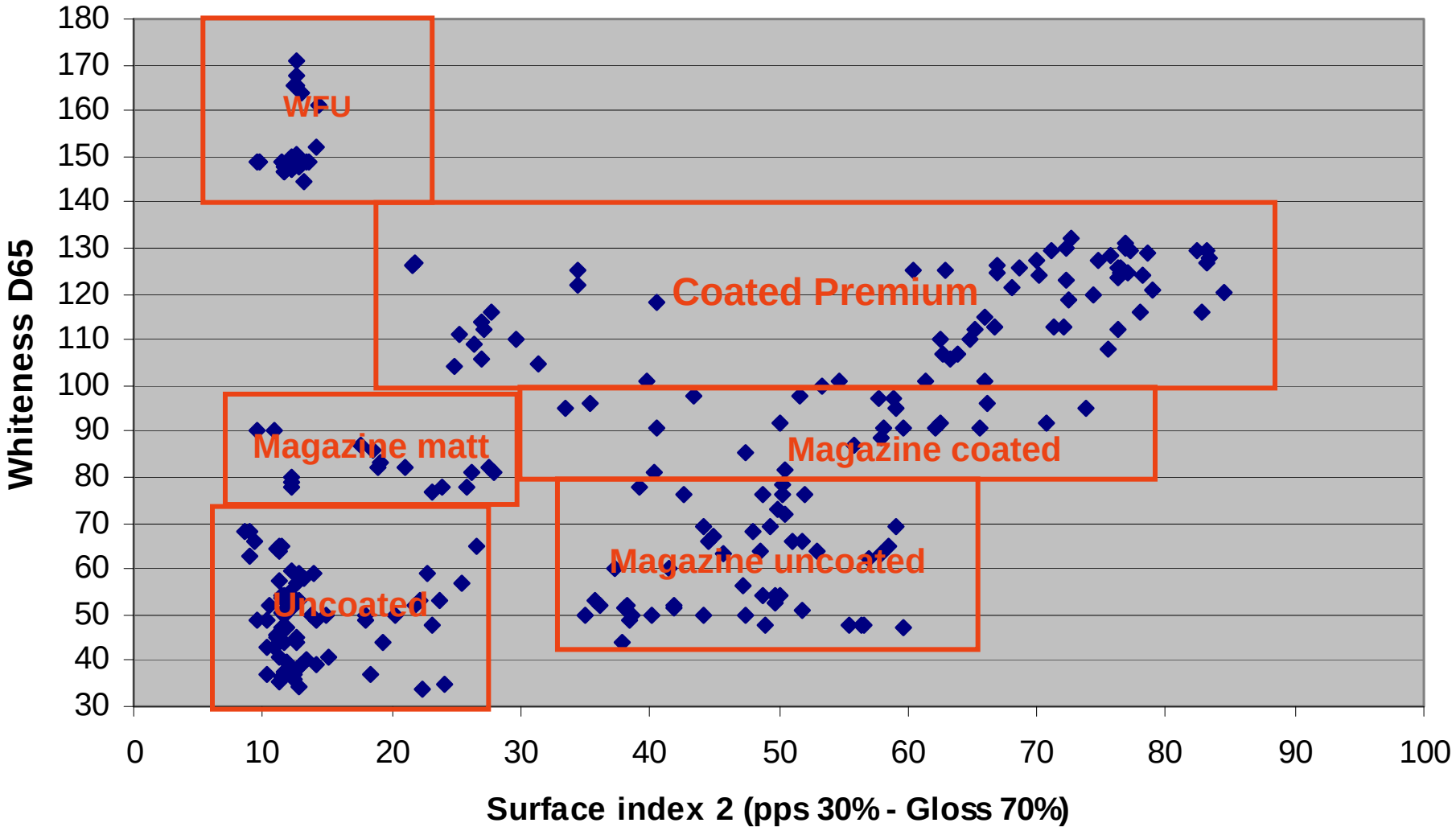
Paper matrix



Based on data from 250 paper from market

Paper matrix and its relation to printing conditions

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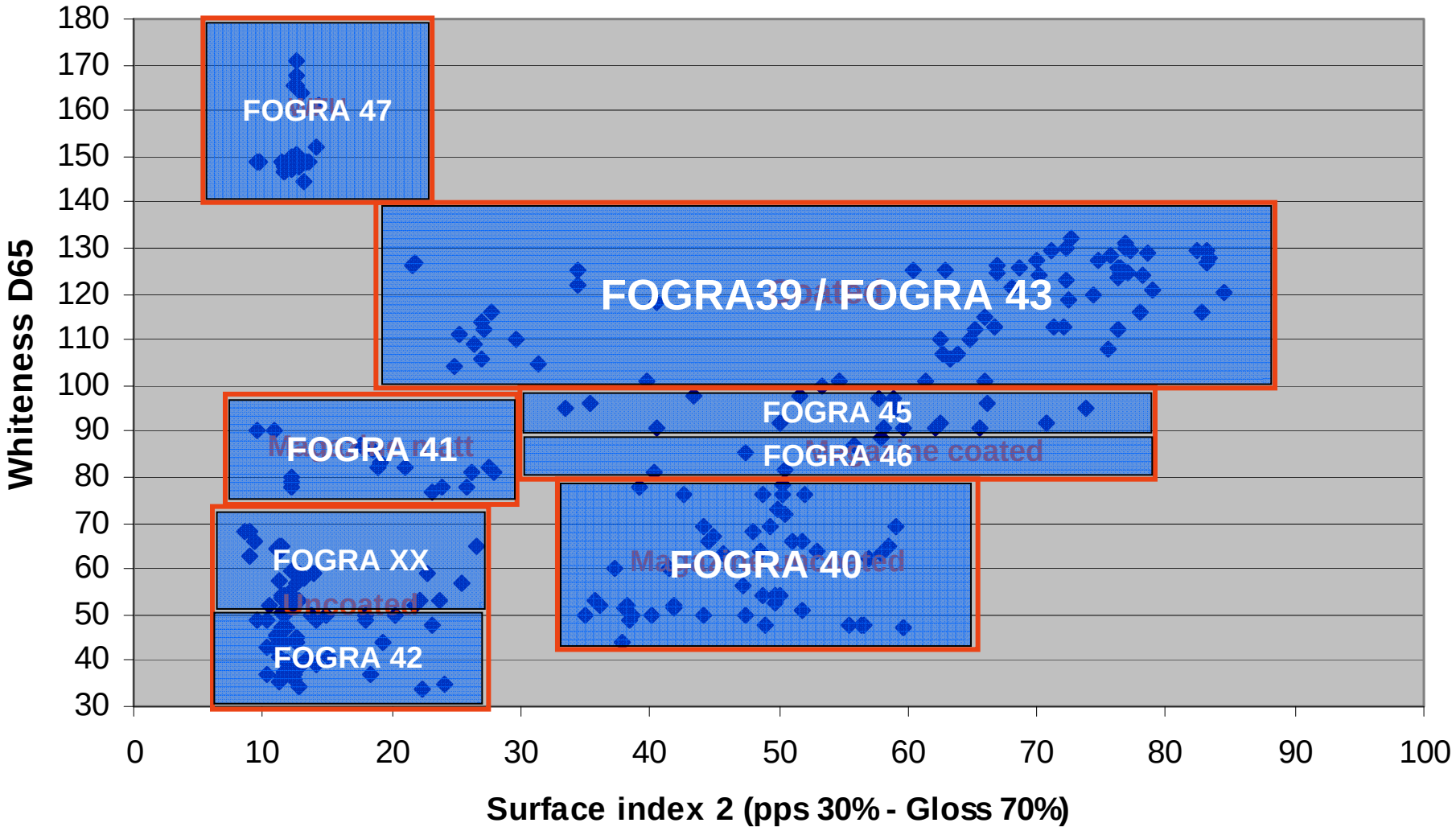

Compared to current ISO 12647-2 categorisation

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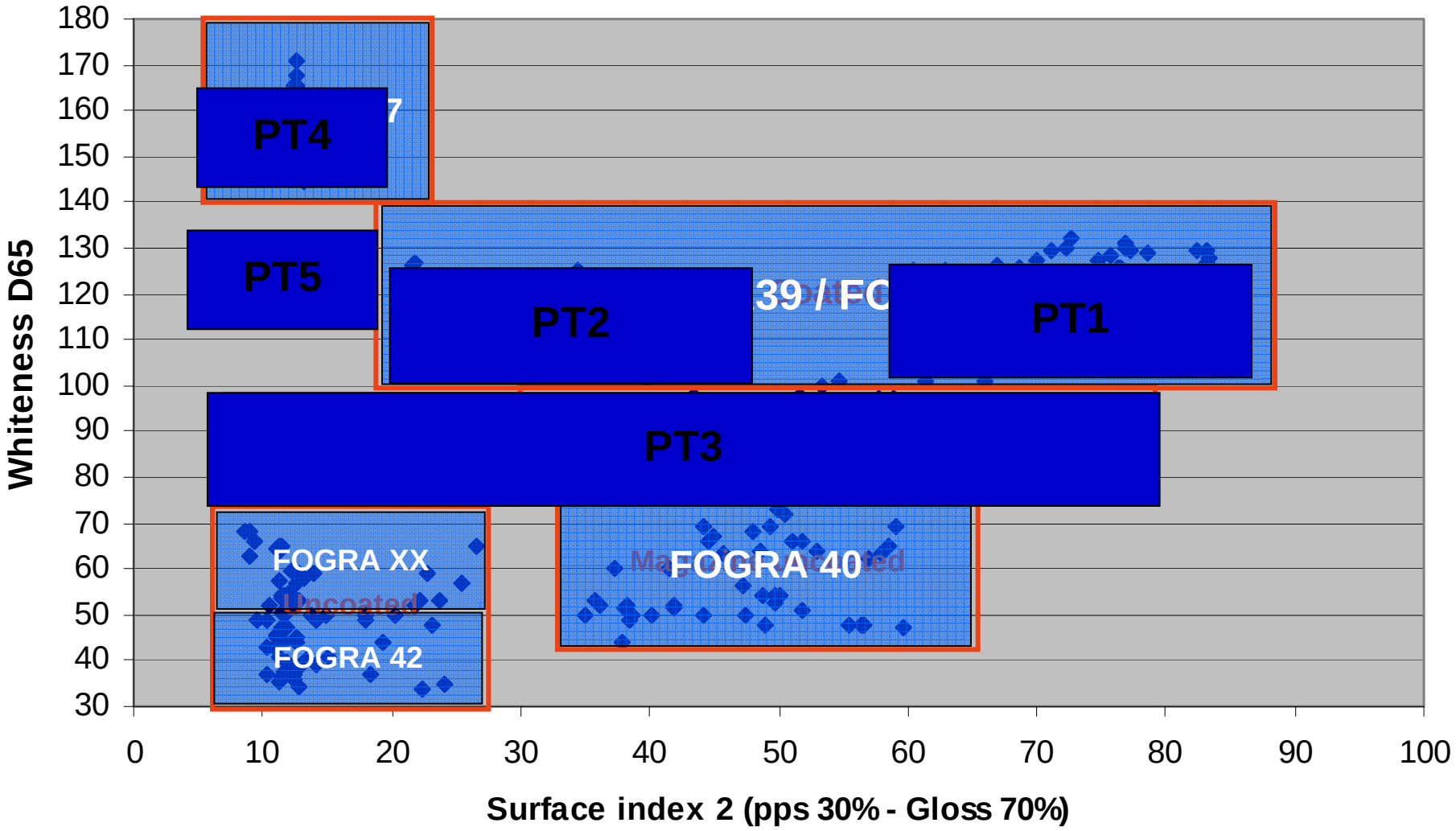

6 paper groups / 8+ printing conditions

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- 6 Groups give direction for the creative world
  - the 6 groups define the minimum amount of groups to characterise the different print substrates in offset method,
  - characterisation data sets used are chosen from the largest available colour gamut
  - as part of the annex to revision of 12647-2 they give guidance for the creation process and use of proofs
  - until the substrate group is preselected the relevant aim values of the characterisation data is valid for informative proofing

- If print substrate is known in the process, the specific aims for proof and production should be chosen from one of the 8+ printing conditions
  - paper manufacturers recommend the printing condition (PC)
  - the selected PC minimises the deviation from the aimed colour to be reproduced
  - gives the printer a specification for process control
  - includes specific needs of production methods (dot gain, screening method, etc)

8+ Printing conditions based on the paper matrix

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SFO

HSWO

	End use	Prepress group	Printing condition	Papers
1	commercial, brochures, manuals, pre-print, direct mail	WFU	Fogra 47	WF Uncoated, Pre-print papers
2	commercial, brochures, direct mail, art books, HQ Magazines and catalogues	Coated Premium	FOGRA 39 / FOGRA 43	WF Coated, MWC
3	HQ Magazines and catalogues	Magazine coated	FOGRA 45	LWC bluish shade
4	Magazines and catalogues, flyer	Magazine coated	FOGRA 46	LWC yellowish shade
5	Magazines and catalogues, flyer, direct mail	Magazine matt	FOGRA 41	MFC, SC-A++
6	Magazines and catalogues, flyer,	Magazine uncoated	FOGRA 40	SC-B, SC-A, SC-A+, Improved Newsprint
7	Special interest magazines, flyer, catalogues, Telephone directories	Uncoated	Fogra XX (new to come)	SC-B, Improved Newsprint,
8	Newspaper, Flyer,	Uncoated	FOGRA 42	Newsprint
9	if new need – e.g. SC-B or other application – e.g. packaging	to be defined	to be defined	to be defined

Paperdam proposal

Characteristic	Print Substrate											
	PS1			PS2			PS3			PS4		
Type of surface	Premium Coated			Improved Coated			Standard Coated			Machine Finished Coated		
Mass-per-area [a]	g/m2	**new**		g/m2	**new**		g/m2	**new**		g/m2	**new**	
	115	**80-250**		70	**60-80**		70	**45-65**		42-55	**56-65**	
CIE Whiteness [b]	%	**new**		%	**new**		%	**new**		%	**new**	
	120	**105-135**		95	**90-105**		85	**60-90**		68-78	**75-90**	
Gloss [c]	%	**new**		%	**new**		%	**new**		%	**new**	
	65	**20-80**		55	**25-65**			**35-55**			**7-35**	
Colour [d]	Coordinates			Coordinates			Coordinates			Coordinates		
	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*
White Backing	95	1	-4	93	0	-1	90	0	1	91	0	1
Black Backing	93	1	-5	90	0	-2	87	0	0	88	0	-1

Characteristic	Print Substrate											
	PS5			PS6			PS7			PS8		
Type of surface	Wood-free Uncoated			Super Calandered			Improved Uncoated			Standard Uncoated		
Mass-per-area [a]	g/m2	**new**		g/m2	**new**		g/m2	**new**		g/m2	**new**	
	115	**80-250**		70	**45-59**		70	**40-56**		42-55	**40-52**	
CIE Whiteness [b]	%	**new**		%	**new**		%	**new**		%	**new**	
	120	**140-175**		95	**45-85**		85	**40-80**		68-78	**35-60**	
Gloss [c]	%	**new**		%	**new**		%	**new**		%	**new**	
	65	**10-20**		55	**30-55**			**15**			**10**	
Colour [d]	Coordinates			Coordinates			Coordinates			Coordinates		
	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*
White Backing	95	1	-4	89	0	5	89	0	3	85	1	5
Black Backing	92	1	-5	86	0	3	86	-1	2	82	0	3

Creative production/pre-press stages – a proposal

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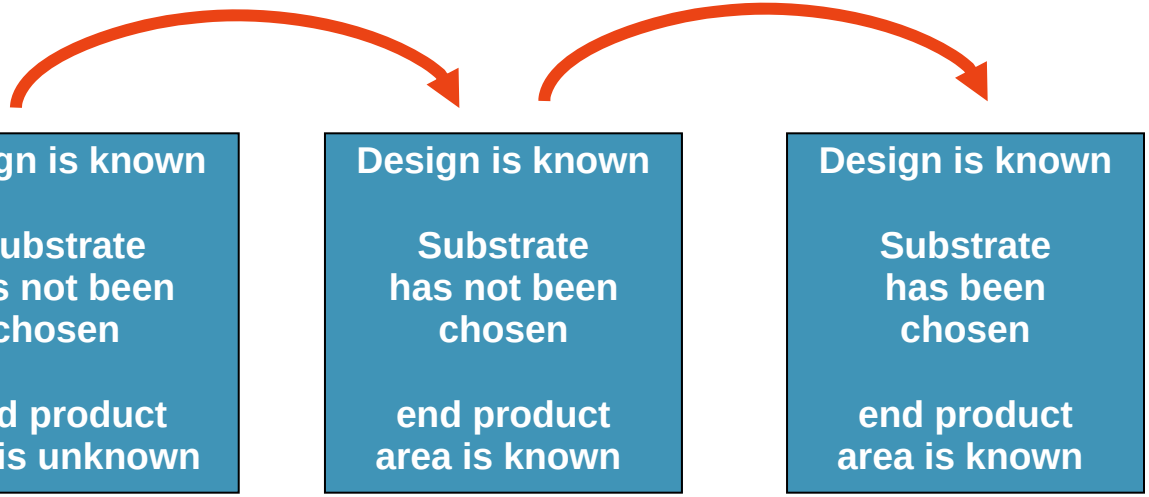

Step			
Aim	Fogra 39 / ISOcoated_V2	1 of the 6 Char. data sets for Prepress	1 of the 8+ Printing Conditions
Validity of proof	Proof for information only (no standard)	Proof gives direction, not binding (12647-8)	Proof is for contract (12647-7)

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