ISO TC 130 + International Color Consortium, ICC:

Paper categorization meeting, Leeds, 2006-06-15

Properties of printing papers:
Specifications, basic requirements for data generation and control of the printing process

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Properties of paper materials for printing

(1) Pertaining to visual properties of printing products, relevant to pre-press and on-press process control
E.g. *Colour, gloss, surface type (determines gamut), opacity, fluorescence, (TVI as compared to a standard paper)*
Purpose: Permit choice of characterization data and proofing substrate

(2) Pertaining to mechanical and other properties
E.g. Dimensions, mass per area, roughness, stiffness, fiber direction, water content, rub resistance, picking strength, ink setting, fan out, ink mileage, coating resistance, also colour.
Purposes
1st: Help the printer, 2nd: input for JDF

(1) Pertaining to visual properties of printing products...

- colour
- surface type (determines gamut)
- gloss (non-normative)
- opacity

- degree of fluorescence
- (TVI as compared to a standard paper)

(1) Paper types 1 to 5 in offset

Table 1 — CIELAB coordinates, gloss, ISO brightness and tolerances for typical paper types. Values in brackets pertain to measurements with a specified white backing.

	L^{*a}	a^{*a}	b^{*a}	Gloss [b]	ISO brightness [c]	Mass per area [d]
Paper type	1	1	1	%	%	g/m²
1: Gloss-coated, wood-free	93 (95)	0 (0)	–3 (–2)	65	89	115
2: Matte-coated, wood-free	92 (94)	0 (0)	–3 (–2)	38	89	115
3: Gloss-coated, web	87 (92)	–1 (0)	3 (5)	55	70	70
4: Uncoated, white	92 (95)	0 (0)	–3 (–2)	6	93	115
5: Uncoated, slightly yellowish	88 (90)	0 (0)	6 (9)	6	73	115
Tolerance	± 3	± 2	± 2	± 5	—	—
Reference paper	94,8	-0,9	2,7	70 - 80	78	150

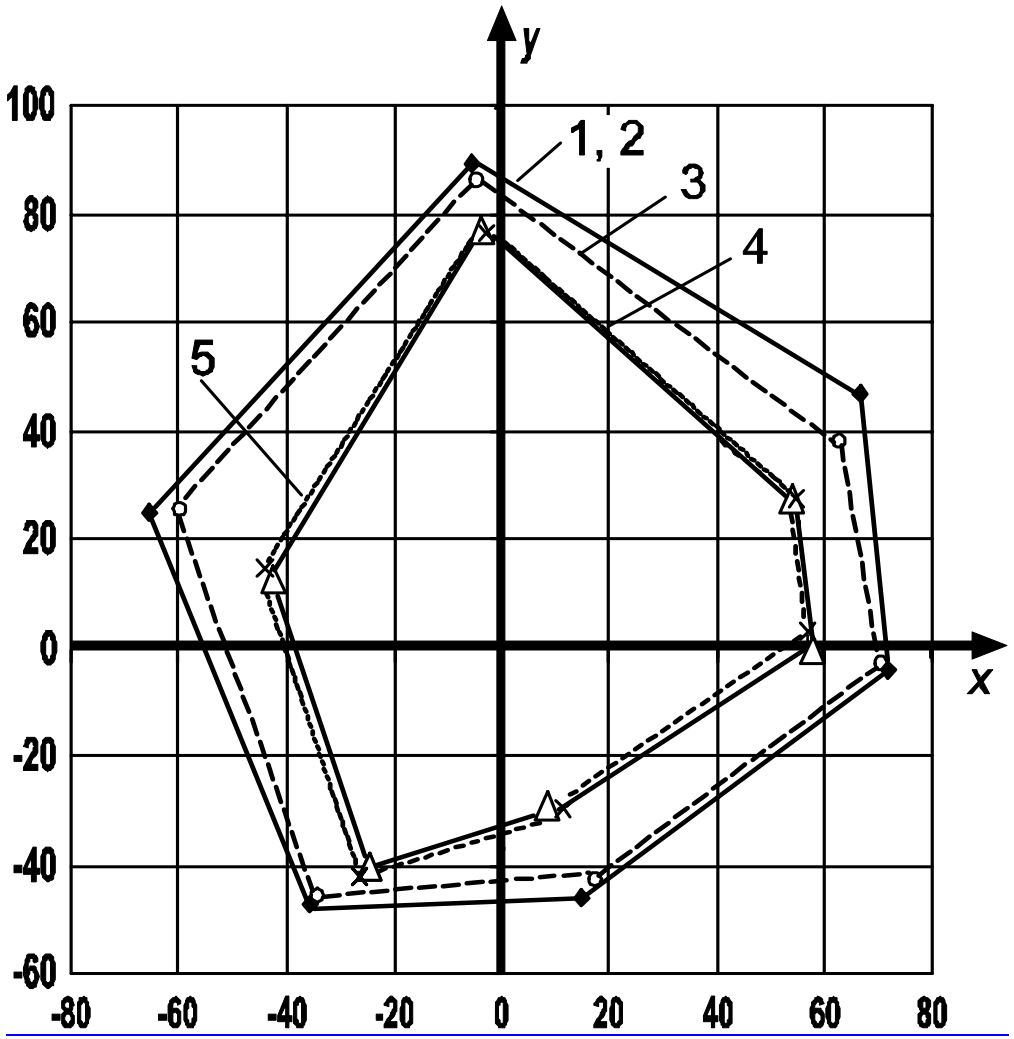
[a] Normative: Measurement according to ISO 12647-1: D50 illuminant, 2° observer, 0/45 or 45/0 geometry, black backing. Informative only: Values in brackets pertain to measurement on the white backing specified by CGATS.5 [5]

[b] Normative: Measurement according to ISO 8254-1, TAPPI method.

[c] Informative only: ISO 2470:1999, substrate backing.

[d] Informative only.

(1) Gamut of 5 offset paper types



(1) Substrate categories 1 to 5 in gravure

Table 1 — CIELAB coordinates, gloss, roughness, and tolerances for the substrate categories.

	L^*[a] [d]	a^*[a]	b^*[a]	Gloss [b]	Roughness [c]	Mass per area [d]
Unit	1	1	1	%	%	g/m^2
Substrate category						
S1: Coated	90 (91) [e]	0 (0)	-3 (-3)	65	0,9	80
S2: Light weight coated (LWC)	86 (88) [e]	0 (1))	2 (3)	55	1,1	51
S3: Super-calendered	86 (89) [e]	-1 (0)	3 (4)	20	1,5	52
S4: Improved newsprint	83 (84) [e]	-1 (0)	3 (4)	<10	3,5	50
Tolerances	[e]	± 2	± 2	± 10	—	—

[a] Measurement according to ISO 12647-1: D50 illuminant, 2° observer, 0/45 or 45/0 geometry, black backing. Values for white backing conditions are included in brackets.

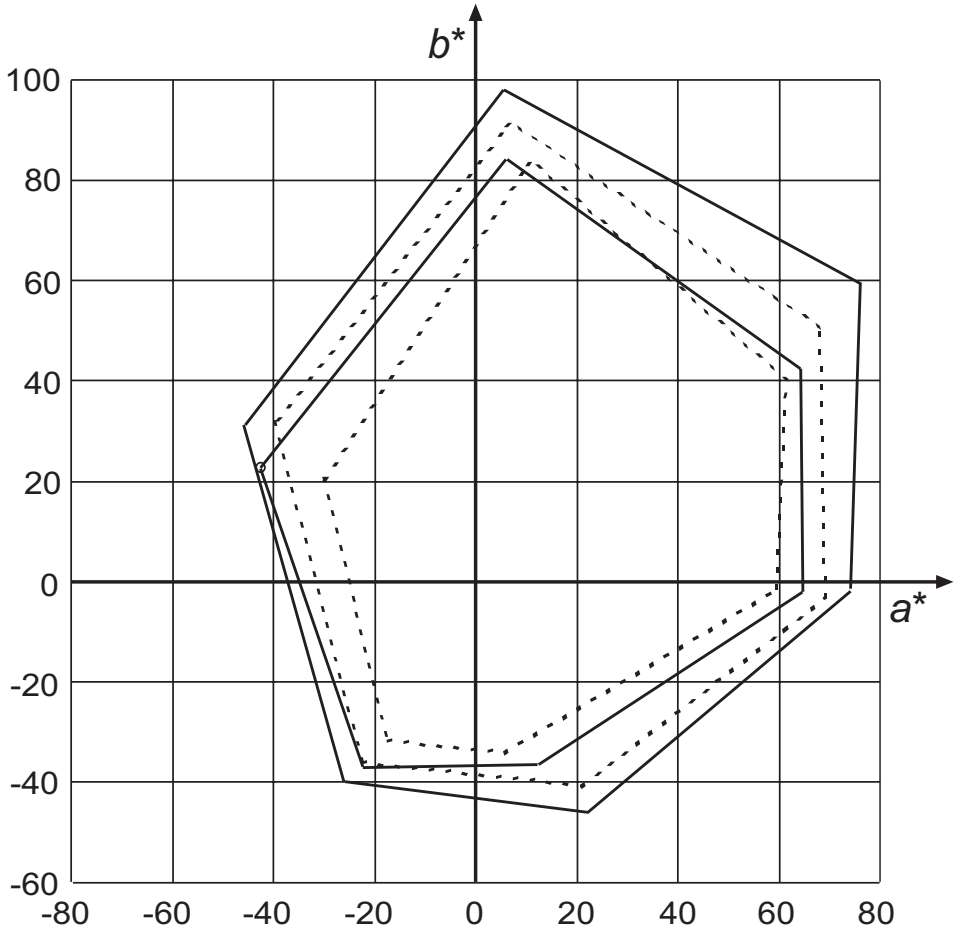
[b] Measurement according to ISO 8254-1, TAPPI method, informative only.

[c] Measurement according to ISO 8791-4 [5], Parker Print-surf, clamping pressure 980 kPa, soft backing, informative only.

[d] Informative only.

[e] The informative *L** value given represents a minimum value.

(1) Gravure gamuts



(1) Plans for the future:

addition of SC, improved newsprint and newsprint

possible shift of paper colours to the blue

make gloss informative only

replace criterion „mass per area“ by opacity

(2) Pertaining to mechanical and other properties

„Forum Druck und Papier“

- 2004 Initiative by Zellcheming (German association of paper chemists) and VDMA (German association of printing press manufactures)
- Aim: to better inform printers regarding print related paper properties and their changes
- Participants: Manufacturers (paper, paper mills, printing presses), Associations (printers, ink supplier, machinery), Research institutes

Results

Optical properties, printability, runnability etc. were categorized according to relevance and availability of measuring methods for different printing processes

	B: necessary for ordering paper	M: additional information necessary for printers	X: nice to have
1 recognized stan-dard measurement	B1	M1	X1
2 no standard measurement	B2	M2	X2
3 no measurement method exists	B3	M3	X3

Intentions

- Properties of category M and already known to paper manufacturers may be communicated in near future 
- Procedures of category 2 have to be standardized
- Procedures of category M3 have to be developed urgently 

Printing processes covered so far

- Sheetfed offset printing
- Newsprinting
- Gravure printing
- Heatset web offset printing

Present results for sheetfed offset papers

- 1B designation , 1B dimensions, 1B thickness, 1B fiber direction, 1B mass/area, 1M opacity, 1M relative humidity, 1M stiffness, 1M resistance of coating against breakage
- 2B colour (database at fogra recommended), 2B gloss (TAPPI 75°), 2B roughness (PPS, Bendtsen), 2B ink setting (printability tester)
- 3X rub resistance, 3X picking, 3X fan out, 3M tone value increase, 3X ink mileage

Paper vendors in Germany:

„We´ll cooperate ...
but somewhat reluctantly“

Thank you for your kind attention

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