

Further development of the European gravure standard:

PSR-V2

Bernhard Schmidt,

Prepress Manager Prinovis Nuremberg,
Chairman of Gravure Working Group

Cologne, 25 June 2009



Gravure Working Group - European Color Initiative

Introduction to PSR v2



Welcome and introduction: James Siever, ERA

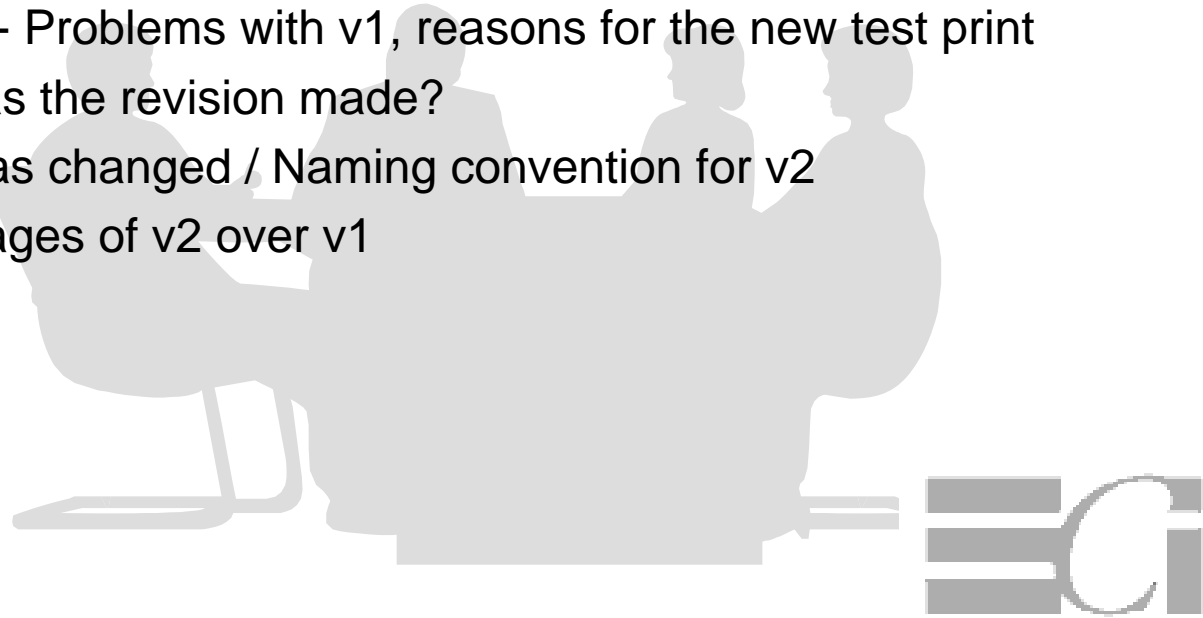
Moderation: Bernhard Schmidt,
Prinovis Nürnberg, Chairman of ECI gravure working group

- **Why a new version of PSR?**
Bernhard Schmidt (*Prinovis Nürnberg*), Renate Rewer (*Laudert*)
- **Implementation in Production – Printing**
Raffaele Belligoli (*Mondadori Printing*), Gary McCrorie (*Polestar Sheffield*)
- **Implementation in Production – Repro**
Johannes Haas (*Meyle & Müller*), Renate Rewer (*Laudert*), Jürgen Seitz (*GMG*),
Stefan Spengler (*impakt-medien*)
- **Lunch 12:30-13:30**
- **First customer experiences with v2 production**
Michael Farkas (*IKEA*), Johannes Haas (*Meyle und Müller by proxy of BAUR-Versand*)
- **Standardisation - Moderation Dr. Claudia Jahn** (*Prinovis Dresden*)
Andreas Kraushaar (*Fogra*), Karl Michael Meinecke, (*bvdm*)
- **Coffee 15:00-15:30**
- **Open discussion with panel of experts to answer questions**
all
- **End of meeting 16:30**

Why a new version of PSR?

Bernhard Schmidt (*Prinovis Nürnberg*), Renate Rewer (*Laudert*)

- History - Problems with v1, reasons for the new test print
- How was the revision made?
- What has changed / Naming convention for v2
- Advantages of v2 over v1



What is 'ECI'?

- 'ECI' stands for 'European Color Initiative'.
- The ECI was founded in 1996 (www.eci.org) and is a non-commercial expert group with the goal of medium-independent processing of colour data.
- It has participants from agencies, publishers, repro houses, printers and research associations
- Within the ECI, there are several working groups with different themes, e.g. PDF standards, digital photography, colour standards, printing, etc.



Development of the European gravure standard PSR – Process Standard Rotogravure

- The Gravure Working Group was founded in the year 2000. The main goal of this working group is the creation of a “Process Standard Rotogravure” for various paper classes, and the preparation of high-quality colour profiles.
- Between 2001 and 2005, gravure standards for several paper qualities were developed.

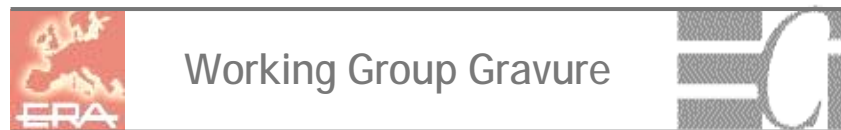


<u>Paper type:</u>	<u>existing PSR ‘V1’</u>	25 June 2009 <u>current: “PSR-V2”</u>
LWC papers (LWC Standard)	LWC since July 2001	LWC-STD
SC papers (SC Standard)	SC since July 2002	SC-STD
LWCPlus papers (formerly called HWC)	HWC since end of 2005	LWC-Plus
MF papers (Machine Finished or News Plus)	MF since Oct 2003	V1 still valid

➤ The Process Standard Rotogravure (PSR) is documented in ISO 12647- 4

The PSR (Process Standard Rotogravure): advantages of standardisation

- The introduction of a gravure standard into the European market has led to a great increase in quality.
- Printed products from different printers have been brought much more into line with each other.
- The complexity for prepress services and customers is significantly reduced.

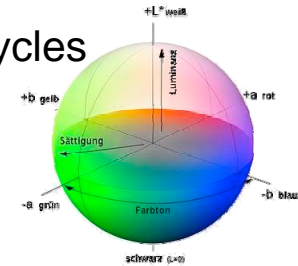


➤ But there has been a lot of development, in both technology and quality, since the introduction of the first standards in 2001

Proofing, colour management and printing have all developed enormously in the last seven years

Prepress

- Many changes and improvements in proofing, with shorter innovation cycles and innovative materials.
- Developments in software for making colour profiles.
- User experience has greatly increased.



Print

- The gradations have been harmonised in the highlights. All tone values print smoothly out to paper white – in some cases even 1 % prints. (in the past, tone values of under 3 % were simply “clipped”)



➤ **Therefore we ask: is our standard still good enough, or can we improve it?**

Criticisms of the existing standard (PSR_ECI_V1):

The key criticisms of the existing standard are:

- The colour gamuts of the different paper types differ widely from each other.
- The grey balance in the Proof has a colour nuance which varies in colour over the whole grey scale from white to black.
- Highlight values below 3 % are clipped, which has a disadvantageous effect on areas where the tone runs out to paper white.
- It is a colour standard which is based on an old proofing technology, und has changed with every new generation of proofers.
- The same standard looks very different on different proof systems.
- There are major differences between the ICC and the proprietary proof profiles.

➤ **The 'go-ahead' for further development of the standard was given in April 2007 at a workshop held with printers and customers in Nuremberg.**

Preparations for the new reference prints

In a series of meetings, the definitions for the new reference prints were agreed by the participating European printers:

- Primary colours and colour gamut
- Homogeneous grey balance
- Optimisation of the engraving curves
- Selection of paper types
- New colour chart (“TC-GMG-2008” with 5 376 patches = IT 8.7 + additional fields)
- Evaluation method and basic requirements for proofing systems
- Printing conditions



➤ **The goal was to draw up a clear “Process Standard Rotogravure” and simultaneously achieve an excellent basis for colour-managed workflows and proofing.**

Carrying out the PSR V2 reference prints on 27 May 2008 at Prinovis in Nuremberg



Paper type	Description
LWC Standard	48 g/m ² – “UPM Cote G” from UPM
SC Standard	52 g/m ² – “Publipress G” from Stora Enso
LWC Plus)*	70 g/m ² – “UPM Ultra G” from UPM

)* The lack of a paper shade standard for LWCPlus papers in the paper industry required a compromise in the proof and profile standardisation. The ‘paper white’ definition in the profiles was set to the average of the LWCPlus papers currently offered in the market.

➤ Afterwards, the data was evaluated, extensive proofing tests carried out, and the results tested for nine months in production.

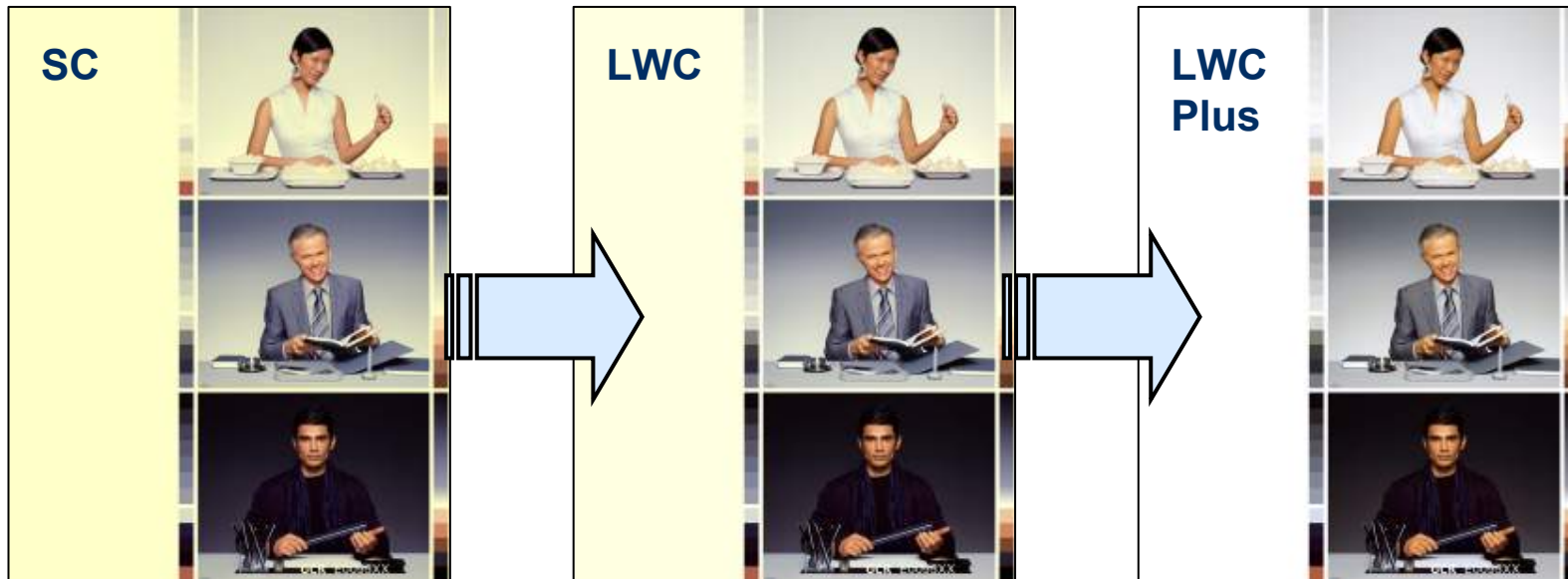
Results



Advantages and improvements of the new standard PSR V2

Colour reproduction on the different paper types:

Print results on the different paper types (SC, LWC und LWC_Plus) are significantly closer to each other

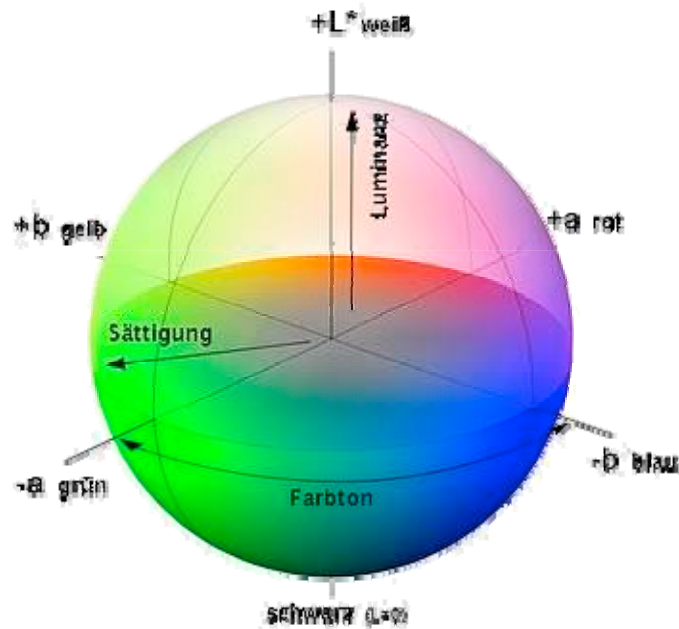


- This simplifies the conversion between paper types. Images look much closer to each other in colour than in the old standard.

Advantages and improvements of the new standard PSR V2

Print – SC Standard has a 20% larger colour gamut

The new PSR_SC standard has a colour gamut around 20% larger than that of the old standard. The saturation nearly reaches that of the LWC standard



- The new SC standard has significantly more contrast and a larger colour gamut – nearly as large as that of the LWC standard

Advantages and improvements of the new standard PSR V2

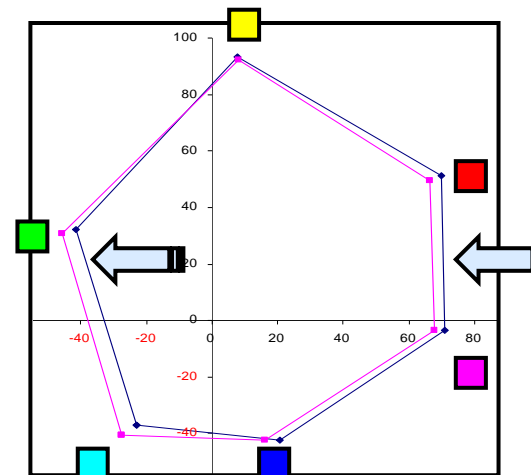
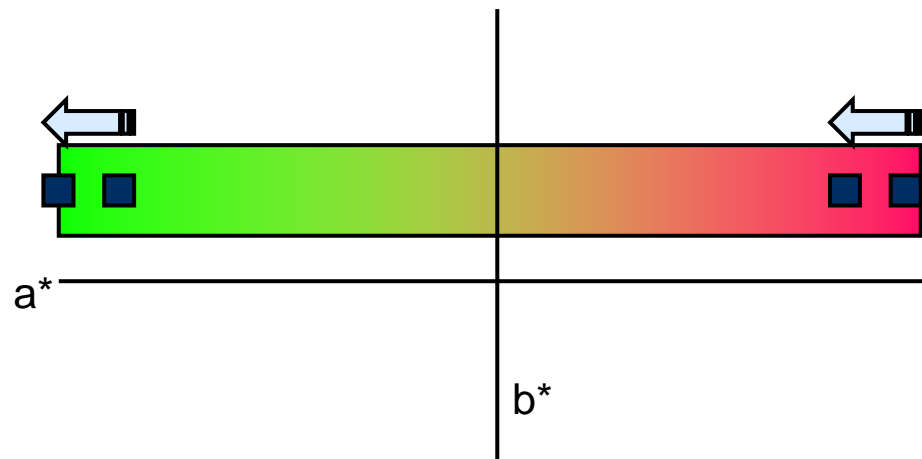
Print – improved grey balance

- More homogeneous gradation of intensity, and less coloured than V1



Print – colour gamut rather closer to offset in green and red

- The colour gamut is moved by a Δa^* of -4 on the a^* axis towards green, and so approaches the offset gamut more closely in this region.



Advantages and improvements of the new standard PSR V2

Proofing

- **Better agreement between the sharpness of the proof and the print with the GMG MX4 profiles – sharpness parameter recommendation for each standard.**

Copy of a proof comment line:

PSR_LWC_STD_Ex880_GMGsemimatte250_V2.mx4 (CAD363DC 3D Sharpness, Strength: 4)

- **ICC proofs and proofs from other proofing system suppliers are closer to each other and to the GMG “.mx4” proofer adaptations.**
- **More harmonic proof profiles, because there is essentially no manual editing.**
- **New procedures for proofer certification, through setting new tolerances and bringing in Fogra.**

Advantages and improvements of the new standard PSR V2

Separation (conversion from RGB to CMYK)

- Very good separation results – good to put into a fully digital workflow, also for use as “digital fabric samples”.
- Significantly higher pattering and contrast range than in the old standard.



Advantages and improvements of the new standard PSR V2

Summary

- Print results on different paper types (SC, LWC and LWC_Plus) are significantly closer to each other.
- Ca 20% greater SC gamut than in the old standard. Colour saturation almost reaches the LWC standard.
- Improved grey balance.
- Gamut moved in the “green” direction and thereby brought closer to offset.
- Closer match of sharpness between proof und print.
- ICC-Proofs and proofing systems from different suppliers match each other better, and also better match the GMG “.mx4” proofer adaptations.
- More harmonic proof profiles.
- New procedures for proofer certification, through setting new tolerances and bringing in Fogra.
- Very good separation results.
- Significantly higher patterning and contrast range than in the old standard.

➤ **The goals aimed for have been achieved!**

Naming convention for the new profiles:

ICC profile:

PSR_papertype_V2_profilingsoftware.icc
e.g. *PSR_LWC_STD_V2_BAS.icc*

Proof profile:

PSR_papertype_proofertype_proofsubstrate_V2.supplierextension
e.g. *PSR_LWC_STD_Ex880_GMGsemimatte250_V2.mx4*

Important Notice:

- There are already various profiles in the market that were intended for pre-release testing. **Please delete all previous profiles that are in circulation** and replace them with the current profiles:–
- ICC profiles from www.eci.org
- Proofer profiles from your proofing system supplier.

Establishment of proof tolerances and certification

- Our goal is to define proof tolerances that are as narrow as possible, and yet are realistic. Many tests and evaluations were carried out for this purpose (Proofs from GMG, CGS, EFI).
- Dr. Hoffstadt (GMG) carried out the extensive evaluations and worked out proposals for choosing tolerance values.
- Together with Fogra, new ways to set tolerances were discussed.
- The Epson x800 und x880 proofing systems were – both visually and by measurement – very close to the reference prints. This was checked with both GMG MX4 and ICC proofs.
- Future proofer certification for PSR should be taken over by Fogra.

➤ **PSR proofer certification will in future only be carried out with colorimetric evaluation.**

Many thanks!

I would like to officially thank all participants who have taken part in the preparation of the new standard.

Particular thanks are due to GMG, which supported us both in the scientific development of the new test chart and the extensive evaluations of the measurement data and the proofs.



Implementation in Production – Printing

Three ways to calibrate the process (ISO/TC 130 Draft 10128)

Bernhard Schmidt, Prinovis Nürnberg

Experiences of printers:

Mondadori Printing – Raffaele Belligoli

Polestar Sheffield – Gary McCrorie



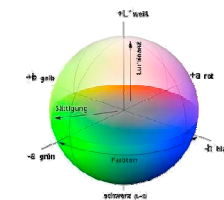
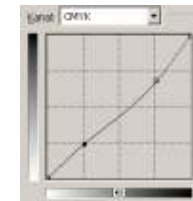
Conversion to PSR V2 in print

Goal: the new standard must be printable by all the printers in Europe.

Instructions have been worked out, which will enable every printer to achieve the new PSR. These are based on the proposed ISO Technical Specification “Proposed ISO TS 10282 – Printing System Calibration”



- **Method 1 – Calibration of the tone value gradations of the primary colours of PSR V2**
Primary colours identical or very close to the PSR V2 colours – *one-channel adaptation*
- **Method 2 – Achieving the grey balance of PSR V2 –**
Prerequisites of Method 1, get as close as possible with Method 1, then deal with the remaining deviations, and do “fine tuning”, with Method 2
- **Method 3 – Device Link Transformation**
Conversion into a local print standard, e.g. when the inks are significantly different, or the deviations with Methods 1 and 2 are too great – *3-dimensional adaptation*



Conversion to PSR V2 in print

Situation of the implementation in print,
and applied methods:

Polestar, UK

Gary McCrorie

Mondadori, Italy

Raffaele Belligoli



Conversion to PSR V2 in repro

Availability of profiles

Bernhard Schmidt, Prinovis Nürnberg

Daily production – round table discussion

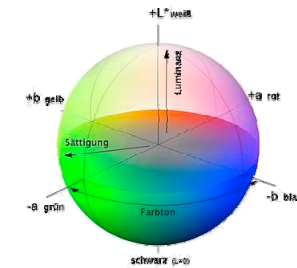
- What does this mean for my database of images?
- How can I switch from V1 to V2 of the standard?
- Advert delivery – daily problems – future prospects
- Experiences to date with the new standard

Renate Rewer, Laudert

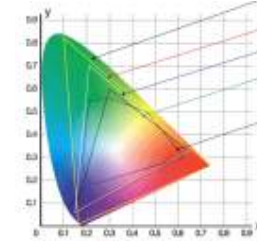
Johannes Haas, Meyle+Müller

Jürgen Seitz, GMG

Stefan Spengler, impakt-medien



Availability of the new profiles



Since yesterday, the ICC profiles can be downloaded from the ECI server.

The profiles were generated by two different software suppliers:

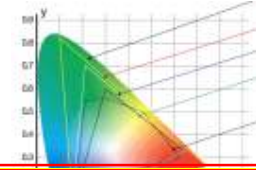
- **Profile Tool** (formerly “Print Open”) – in the perceptive rendering intent, 5% lighter than basIColor
- **basIColor** – in the perceptive rendering intent, 5% darker than “Profile Tool”

Paper class	Made with “Profile Tool” *	Made with “basIColor”
LWC Plus	PSR_LWC_PLUS_V2_PT.icc	PSR_LWC_PLUS_V2_BAS.icc
LWC Standard	PSR_LWC_STD_V2_PT.icc	PSR_LWC_STD_V2_BAS.icc
SC Standard	PSR_SC_STD_V2_PT.icc	PSR_SC_STD_V2_BAS.icc
SC Plus	<i>in preparation</i>	<i>in preparation</i>

* Profile Tool, Heidelberg

➤ **ICC profiles are available under www.eci.org**
Recommendation: please use only original profiles

Special features



Important change:

The profile identification “HWC” in the V1 profiles has been replaced with the correct paper identification “LWC PLUS”

▪ **baslColor**

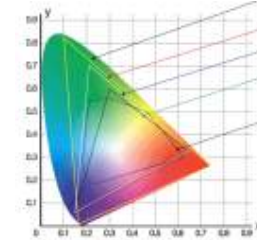
Paper class	Made with “Profile Tool” *	Made with “...
LWC Plus	PSR_LWC_PLUS_V2_PT.icc	PSR_LWC_PL
LWC Standard	PSR_LWC_STD_V2_PT.icc	PSR_LWC_S
SC Standard	PSR_SC_STD_V2_PT.icc	PSR_SC_STD_V
SC Plus	<i>in preparation</i>	<i>in preparation</i>

SC-Plus is in preparation – to be published ca. Sept 09

* Profile Tool, Heidelberg

➤ ICC profiles are available under www.eci.org
 Recommendation: please use only original profiles

Availability of special proof profiles



Special proof profiles may be downloaded from the respective proofing system supplier.

In this way, optimum support for the proofing system will also be secured.

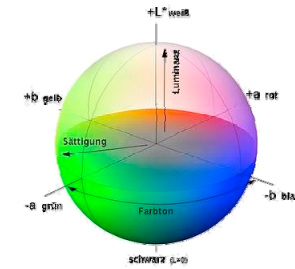
Example: Naming of “.mx4” proof profiles (profiles for GMG proofers):

Paper class	Old name “PSR V1”	New name “PSR V2”
LWC Plus	PSR_ECI_HWC_Proofertype_Substrate_V1.mx4	PSR_LWC_PLUS_Proofertype_Substrate_V2.mx4
LWC Standard	PSR_ECI_LWC_Proofertype_Substrate_V1.mx4	PSR_LWC_STD_Proofertype_Substrate_V2.mx4
SC Standard	PSR_ECI_SC_Proofertype_Substrate_V1.mx4	PSR_SC_STD_Proofertype_Substrate_V2.mx4
News plus	PSR_ECI_MF_V2_Proofertype_Substrate_V1.mx4	<i>News Plus – for now, stay with the old standard</i>

➤ **Proof profiles directly from the proofing system supplier**

Conversion to PSR V2 in repro

Daily production - Round Table discussion



Bon Appétit



Customers report their experiences

Status of implementation in printing, and methods used:

IKEA

Michael Farkas

BAUR-Versand

Johannes Haas from meyle+müller reports
on behalf of Herr Jaeger of BAUR-Versand



Standardization

Dr. Claudia Jahn, *Prinovis Dresden*



Coffee break



30 minutes

Annex: Overview of paper types

	Paper class		Definition	ISO Brightness	Examples	Proof parameters
uncoated grades	N-ST	News Standard	Standard newsprint without adaption to gravure	58-59	Holmen News	
	N-P	News Plus	Improved newsprint for gravure	68-76	Holmen Plus G68, Exopress, Flyopress	PSR_ECI_MF....V1.mx4
	DIR	Directory	uncoated directory paper	56-71	Opalite G, Opalite 67 G, Alfa (+)	
	SC-B	SC-B	only calandered, high content of recycled fibre	65-69	UPM ECO, Envipress	
	SC-STD	SC Standard	super calandered magazine paper	67-68	UPM Max G, Publipress, GraphoGrande	PSR_SC_STD_....._V2.mx4
	SC-P	SC Plus	Optically improved SC-paper	72-75	UPM cat, M-Plus, GraphoGrande	PSR_SC_PLUS_....._V2.mx4
	SC-80	SC 80	Highly opt. improved SC-paper, partly matt	79-82	UPM Lux 80, Innopress, GraphoPrestige	
coated grades	LWC-B	LWC B	Light weight coated, High content of recycled fibre, film coated	72	Ultra Mag RG	
	LWC-STD	LWC Standard	Light weight coated, "catalogue" brightness	67-72	UPM Cote G, Bavaria Ultra, Turnopress	PSR_LWC_STD_....._V2.mx4
	LWC-STD Mag	LWC Standard	Light weight coated, "magazine" brightness	72-76	Bavaria Classic, Neopress, UPM Cote G	
	LWC-P	LWC Plus	Optically improved LWC paper	78-87	UPM Cote Plus, Terrapress, UPM Ultra, My Brite	PSR_LWC_PLUS_....._V2.mx4
	MWC-90	MWC 90	Medium weight coated; double coated, very high brightness, optical brighteners	90-92	UPM Star, Novapress G	
	HWC-WF	HWC woodfree	Heavy weight coated, 2-3 times coated offset paper, optical brighteners,	>92	Galerie fine, Royal Xpress, UPM Finesse	"House standards"

PSR Standard V1
 PSR Standard V2
 PSR Standard V2 with adapted paper shade
 – this profile adaptation is still to be made.

Contact for further information

Bernhard Schmidt

Head of Process und Prepress

PRINOVIS Nürnberg

Phone: +49 911 8003-660

Email: bernhard.schmidt@prinovis.com

