Spot color proofing and printing

Considerations about spot color handling

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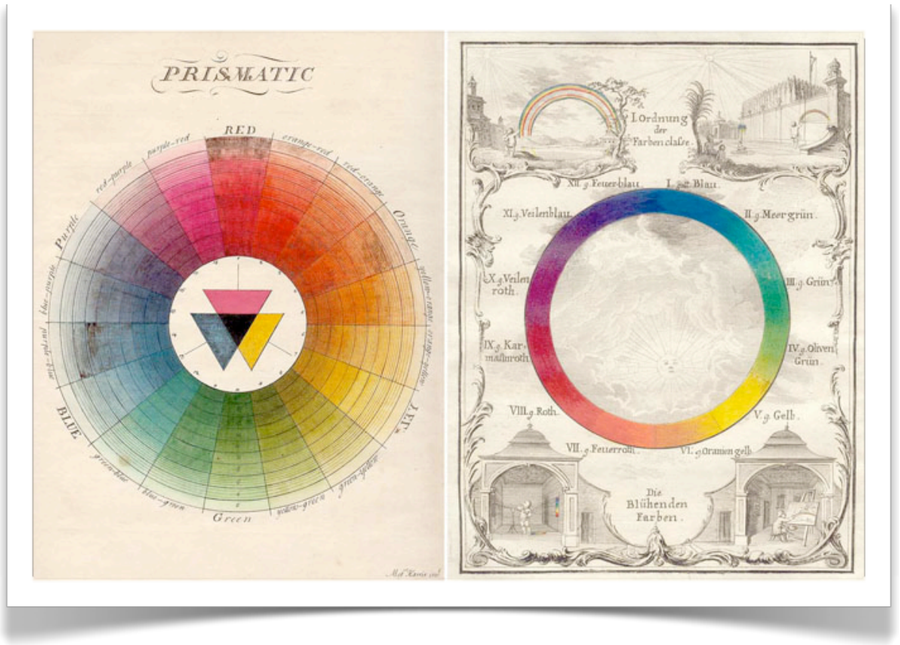
Who is ColorLogic?

- We develop high-end Color Management solutions
- Founded in March, 2002
- Privately-owned, independent German company
- Our team has excellent skills and solid experience in the field of color reproduction, print and in the development of color management solutions
- Products:
  - ICC profiling and DeviceLink applications: **CoPrA**, **Reprofiler**
  - ICC compatible ColorServer **ZePrA**
  - Separation checking: **ProfileTagger**
  - Precalculated DeviceLink-Profile-Sets for all international printing standards: **DLS**



A few of todays problems with spot color rendering

- Preview/simulation of spot colors in PDF rendering applications is not good enough
- There is not enough information about the color, gradation behavior and opacity for spot colors in todays PDF files
- Missing multicolor profile support in many image editing and PDF rendering applications
- Not much support for PDF/X-5n (multicolor output intent)
- We must not forget that proofing and production have different needs!
  - Proofing needs to accurately simulate what is in the file
  - Production needs to convert spot colors to process inks and needs to be able to print them flawlessly

A few of todays problems with spot color conversion

- One Lab value for the full tone of a spot color only is not good enough
- Simple rendering of Lab values with abs. col. to the target color space is not sufficient for closest deltaE calculation
- Often too many channels are produced when converting spot colors
- Gradations of converted spot colors tend to be unsmooth when printing
- Converting spot colors to process colors might change overprint behavior
- Missing opacity information for calculating overprints from spot colors with other process and spot colors

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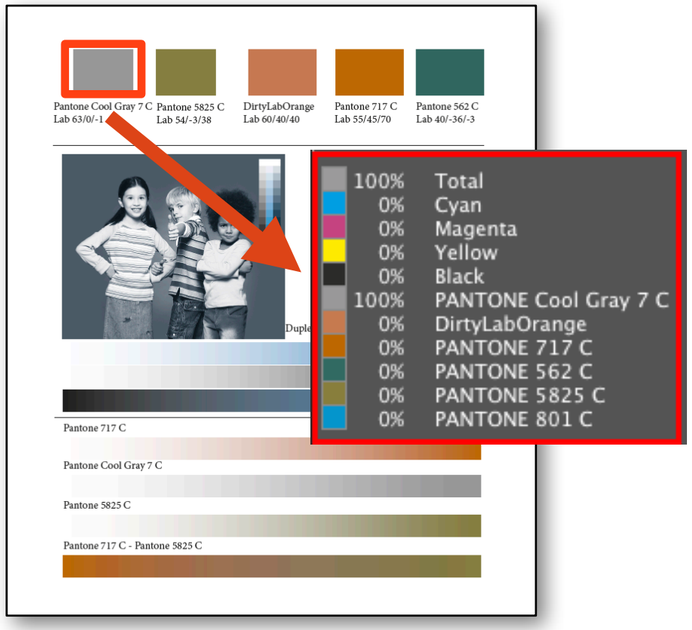
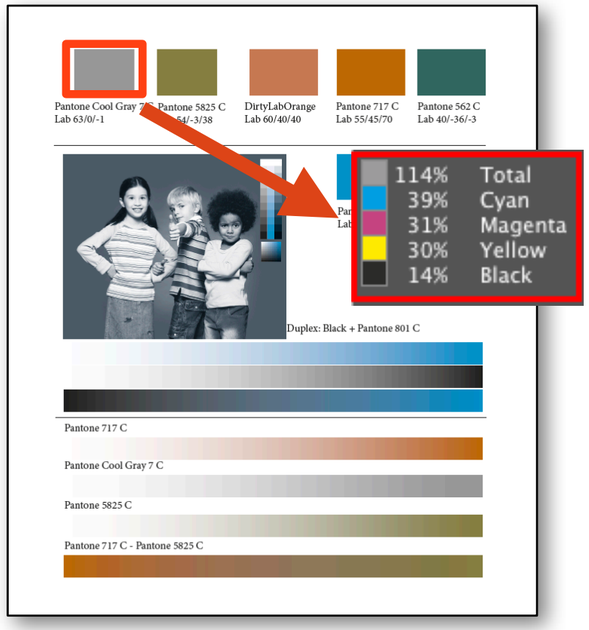
- See an example on the next slide

ZePrA 3.5

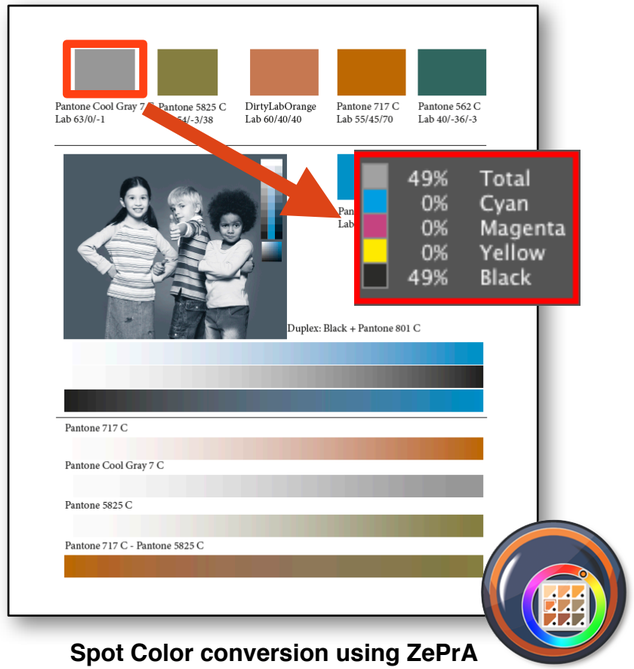
- **Accurate Spot Color matching** and **conversion** to CMYK and Multicolor printing systems.



PDF document containing spot colors



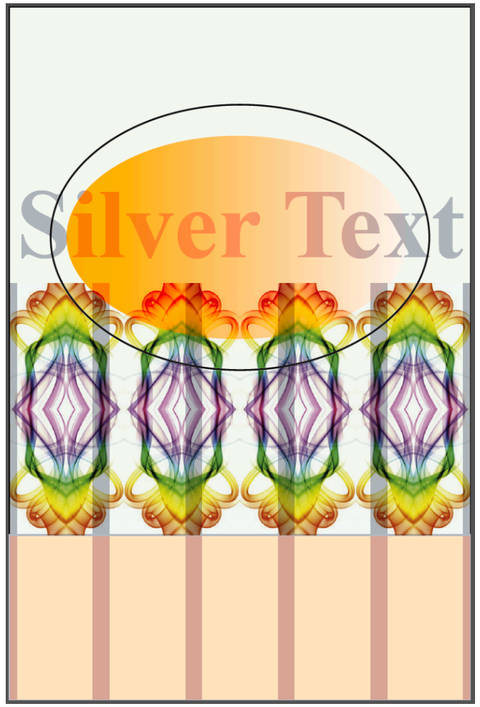
Spot Color conversion using other solutions



Spot Color conversion using ZePrA

Proposed solution from the ICC and GWG

- Adding spectral information for each spot color in a PDF file is a good suggestion
- Adding this information in the next PDF 2.0 specification would be a valid improvement



Proposed solution from the ICC and GWG

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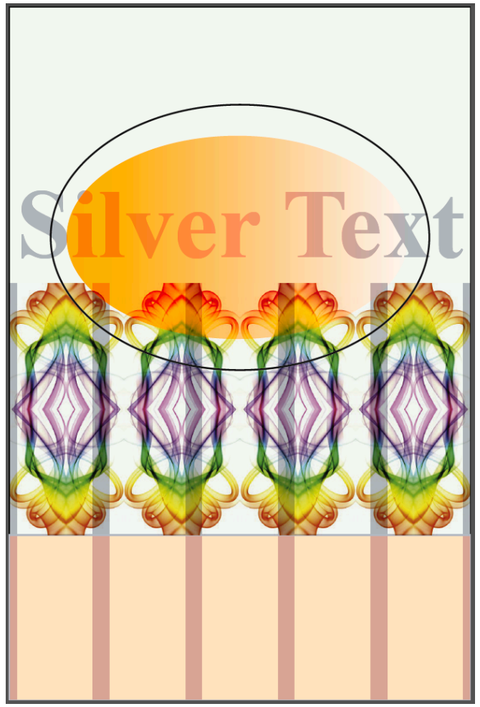
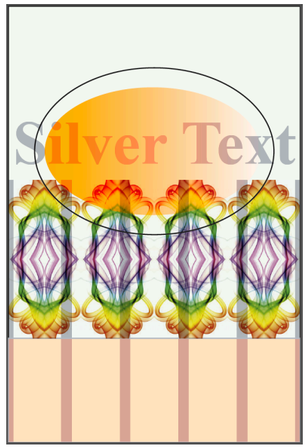
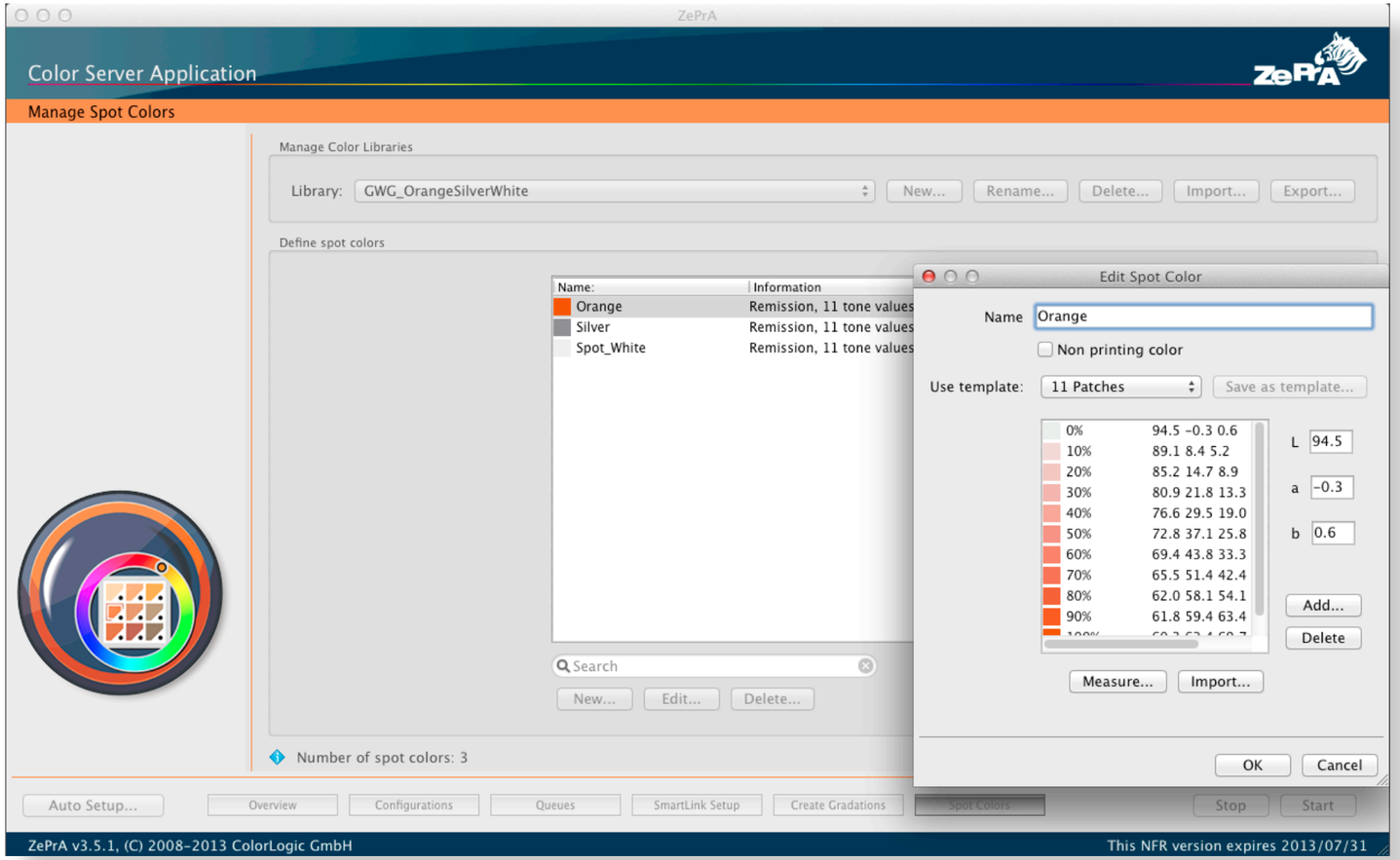
- But there is no suggestion on how to do the conversion for production
  - What should be the target?
  - What is just acceptable or what should a very good result look like?
- Potential uncertainty in the example PDF for spot colors printed on white
  - FOGRA 39 has a white point of 95/0/-2 but the white of the substrate the spot inks are printed on differs slightly?
  - That would be a typical situation if spot characterization data is added to a PDF, so that a recommendation which white point to take would be needed
- We need better example files than this one in order to talk about quality!



What have we done with the example PDF file - Step I

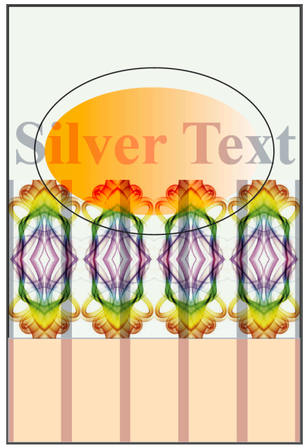
- Extraction of the spectral data from embedded CXF and importing in our color server ZePrA spot color library

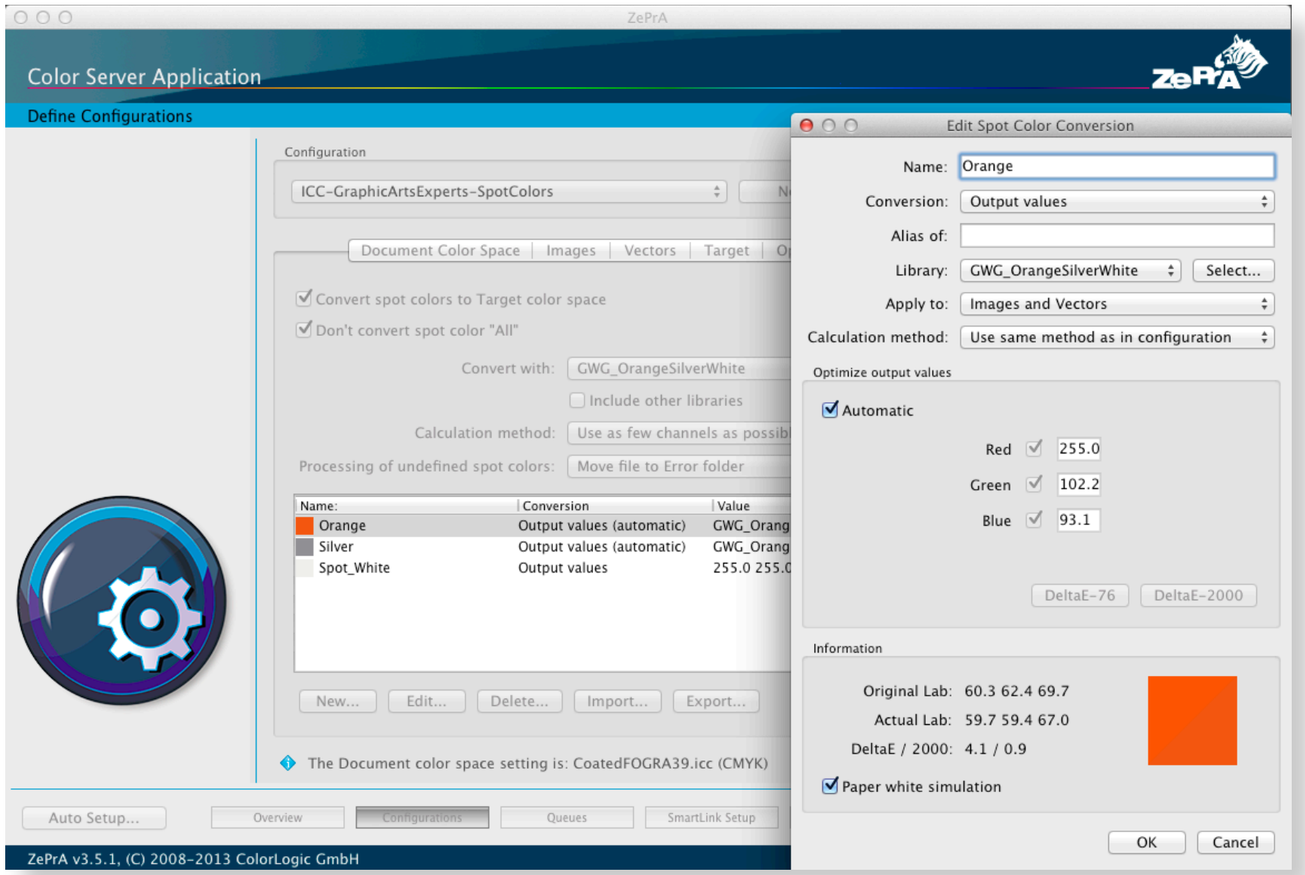




Step 2

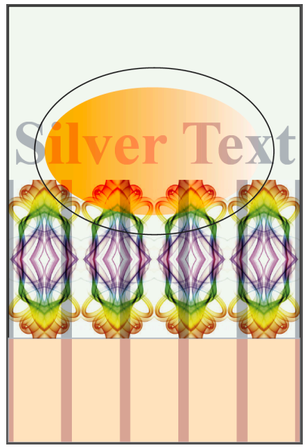
- Calculate full tone spot colors to target color space (in our example an RGB printer) with closest dE00
  - Orange: 0.9 dE00
  - Silver: 0.1 dE00
  - Spot_White: 0.6 dE00





Step 3

- Rendering of the PDF to a 7 channel pixel file
- Converting CMYK parts from FOGRA39 to profiled RGB printer, spot inks with spot color library and combinations of spot and process inks with mathematical overprint models
- Print on the Epson 4880 using the normal RGB driver with CMS disabled



ugra Ugra Proof and Print Certification Tool

Date:	2013-5-7 10:39:58	Printer:	Epson 4880
Reference:	ISO Coated v2 (FOGRA39L)	Paper:	CGS Proofing paper
Device:	eye-one	Inktype:	
Job:	Proof von ISO Coated V2	Notes:	

Category	Delta	Limit	Result
Paper (dE)	0.87	3.00	OK
Average (dE)	1.88	3.00	OK
Maximum (dE)	4.88	6.00	OK
Primaries (dE)	3.10	5.00	OK
Primaries (dH)	1.59	2.50	OK
Average Gray (dH)	0.56	1.50	OK
UGRA-Score			65.3%

Proof is certified!

Signature

A look in the future

- As soon as the spot color data is defined to be in PDF 2.0, we will adapt our color server software to take advantage of the valuable additional data.
- The PDF creation side needs easy access to addition spectral spot color information to embed them in the production PDF file.
- Where does the spectral information about the spot colors come from and how valid is it for the desired design job?
- Proofing and Workflow tools should be able to automatically detect embedded spot color information and either use it or replace it with other/better suited information.
- Extracting the spectral information and using them for verification will be important.

Thank you for your attention

for all of your
Color Management needs