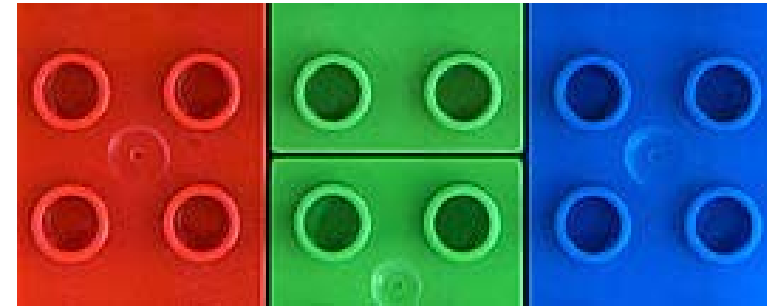


GMG ColorMaster

Automated RGB-workflow
using a Master-Colorspace



ICC/ HP Digital Print Day, 15th of June 2011

Juergen Seitz, GMG

Overview

- ▶ Challenges
- ▶ RGB colorspaces
- ▶ CMYK colorspaces
- ▶ ColorMaster workflow
- ▶ Gamut mapping needs

Challenge of Color Reproduction



- Various RGB-spaces
- Output devices
- Printing Standards
- Media
- Printing processes
- ...

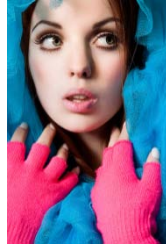
-> make the image look alike!



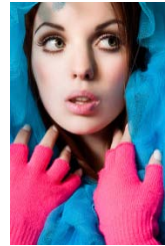
Different international printing standards



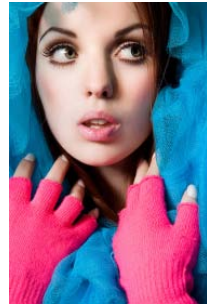
PSR-LWCv2



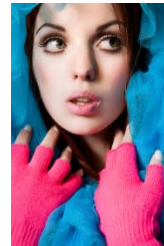
ISOcoatedV2



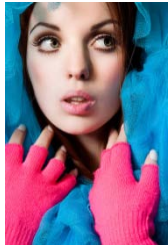
Swop#5



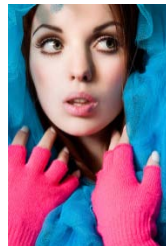
Master



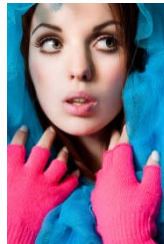
JapanColor



PSOuncoated



DigitalPrint



Monitor



Challenging sources

- Existing image databases with different colorspaces
- Images may be RGB or CMYK
- Linework defined in CMYK

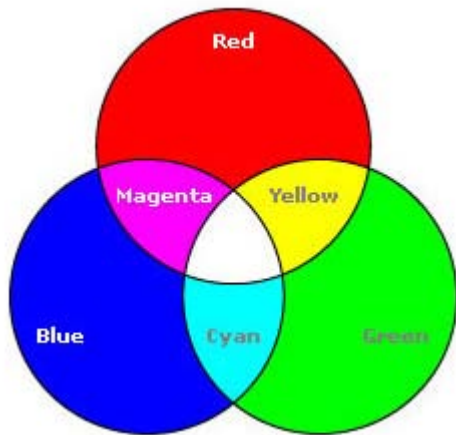


Overview

- ▶ Challenges
- ▶ RGB colorspaces
- ▶ CMYK colorspaces
- ▶ ColorMaster workflow
- ▶ Gamut mapping needs

Every device has a different colorspace

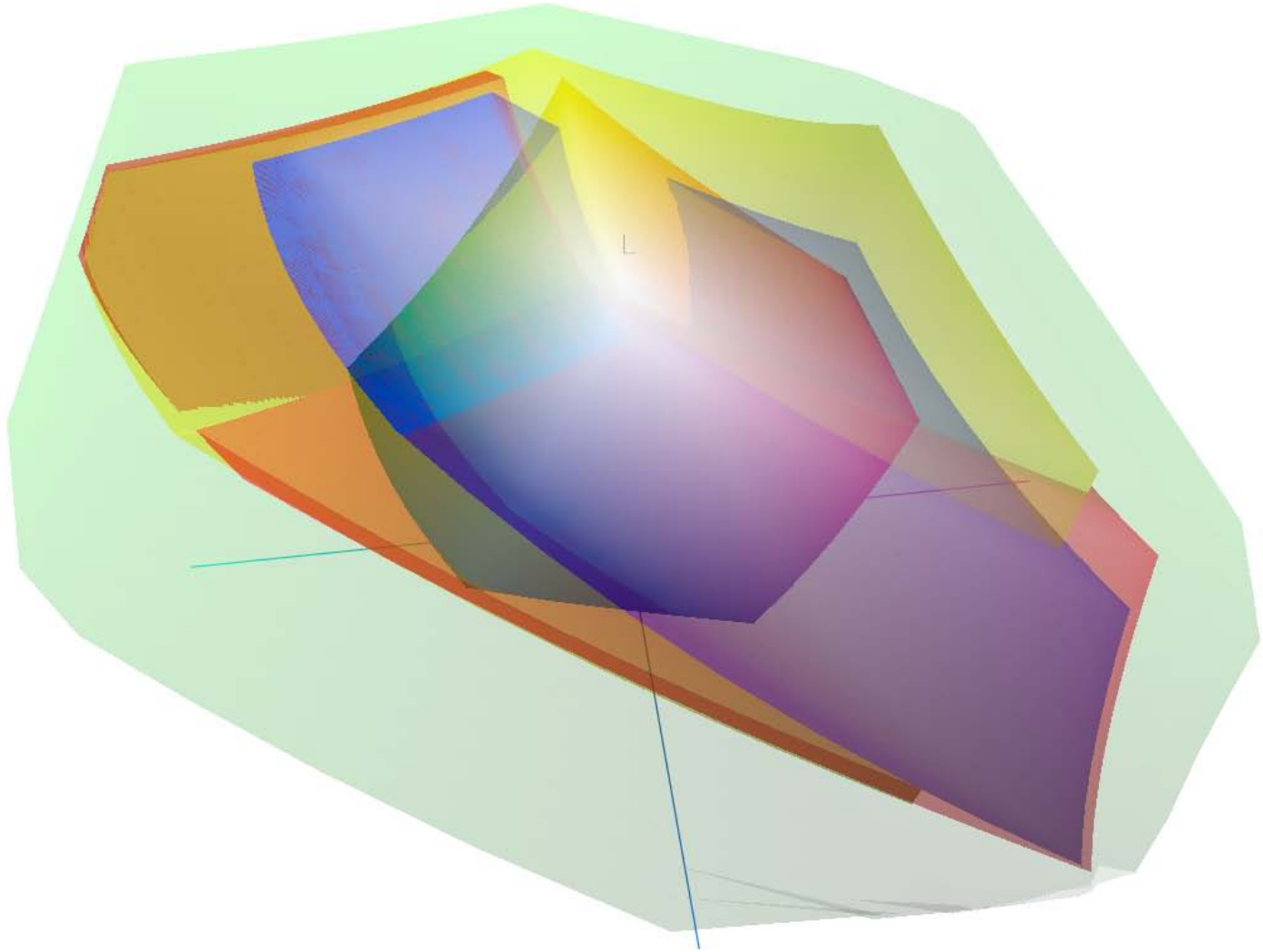
▶ Different RGB ColorSpaces



▶ Cameras, Monitors, Standards, ...

RGB

gmg color

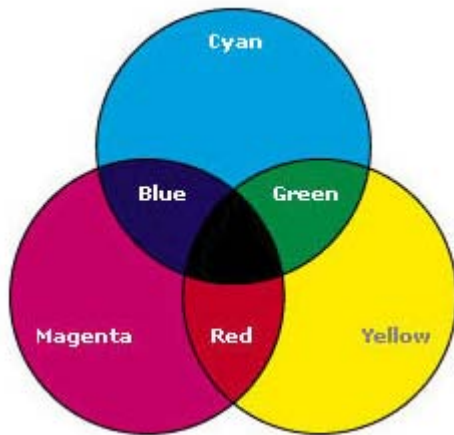


Overview

- ▶ Challenges
- ▶ RGB colorspaces
- ▶ CMYK colorspaces
- ▶ ColorMaster workflow
- ▶ Gamut mapping needs

Every device has a different colorspace

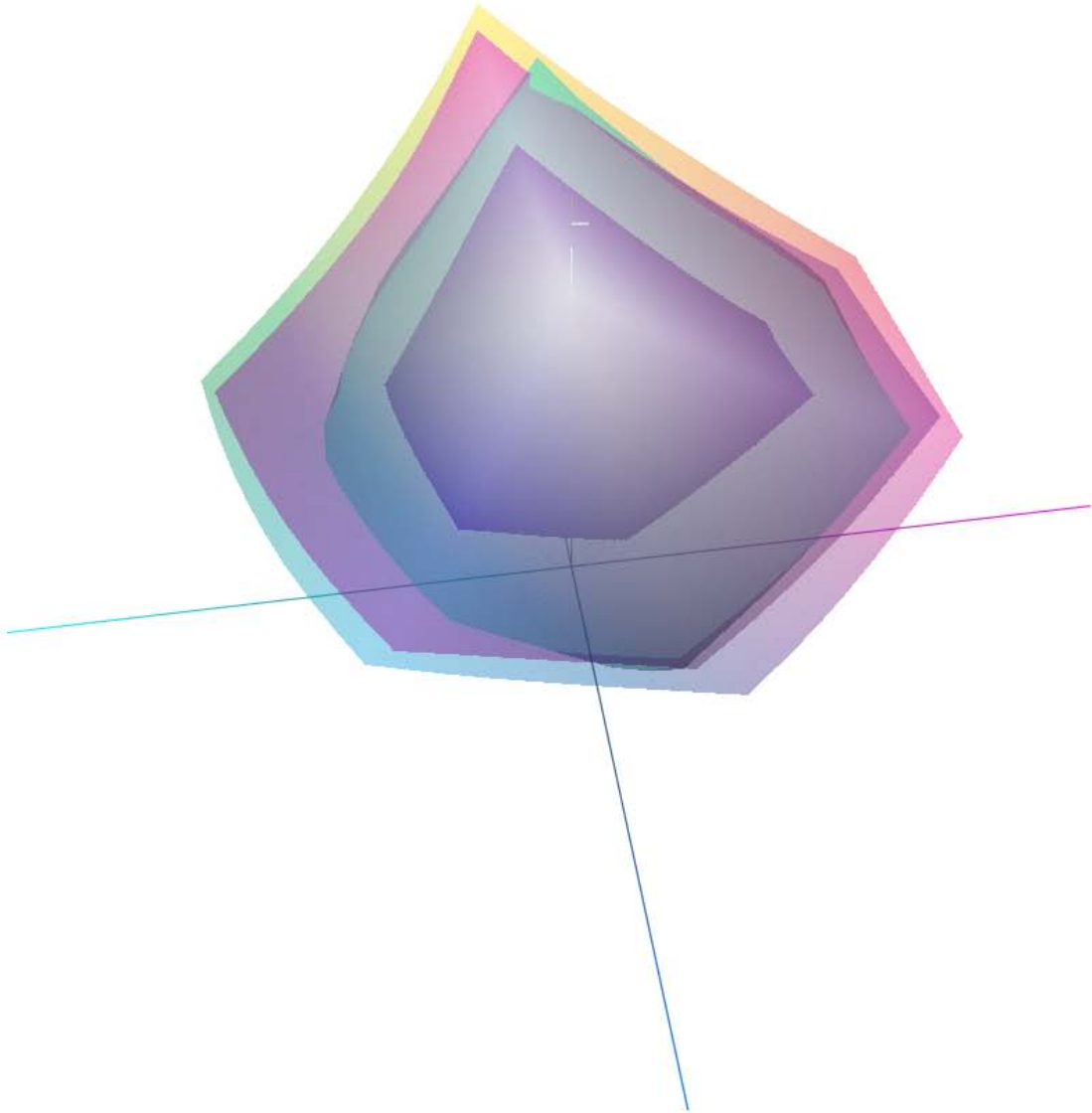
▶ Different CMYK ColorSpaces



▶ Printing process, substrates, pigments, ...

CMYK

gmg color



Advantages of working in RGB

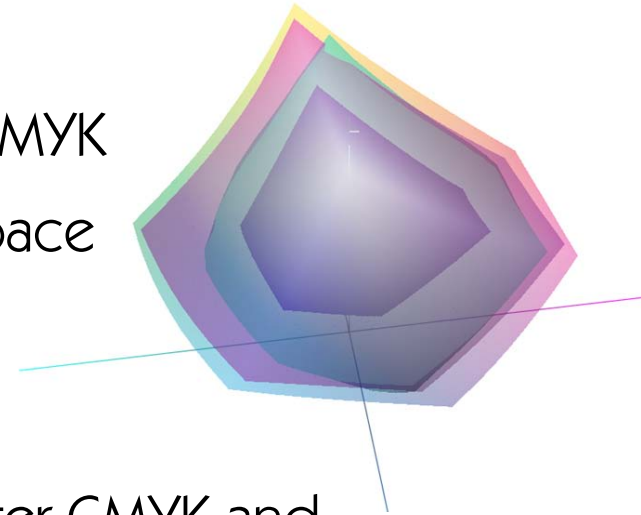
- ▶ Huge color space
- ▶ Independent from Print Process
- ▶ Less retouching complexity
- ▶ Media-neutral

Overview

- ▶ Challenges
- ▶ RGB colorspaces
- ▶ CMYK colorspaces
- ▶ ColorMaster workflow
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ColorMaster in production

- ▶ All CMYK to be defined in ColorMaster-CMYK
- ▶ All RGB is judged in ColorMaster color space
- ▶ No CMYK-Retouching
- ▶ Automated processing of the final data
- ▶ The resulting output combines ColorMaster CMYK and Adobe RGB in a perfect separation to the target printing condition
- ▶ Optimum output to desired output color space in CMYK
- ▶ Unified separation on the printing form



ColorMaster production steps

- ▶ 1 – RGB Normalizing
- ▶ 2 – RGB retouching in GMG ColorMaster color space
- ▶ 3 – Color OK – GMG PhotoProof (PaperTransparency)
- ▶ 4 – Data and color conversion to different printing conditions
- ▶ 5 – Legally compliant GMG hardcopy Proof of the final page

1 - RGB Normalizing



Input:
Various RGB color spaces



Normalized color to AdobeRGB

2 – RGB GMG ColorMaster retouching

- ▶ All retouching is done in RGB
- ▶ ROOM? Retouch once – output many
Color corrections are applied to RGB images
- ▶ All retouching and corrections are done
with GMG ColorMaster soft proof preview



3 - Color OK – GMG PhotoProof



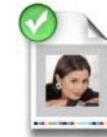
GMG ColorMaster optimized AdobeRGB images



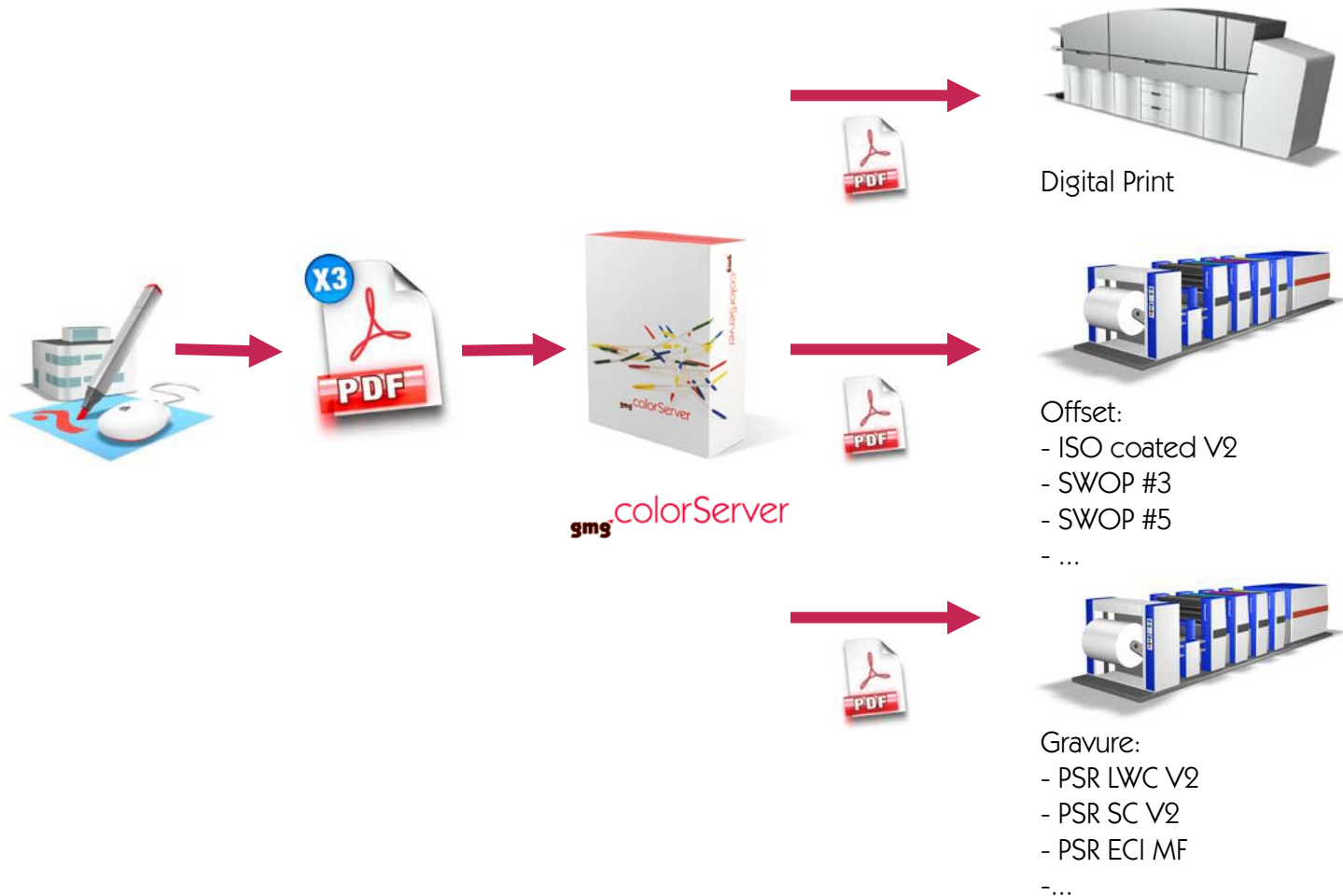
or



GMG ColorMaster optimized page with AdobeRGB images and ColorMaster artwork

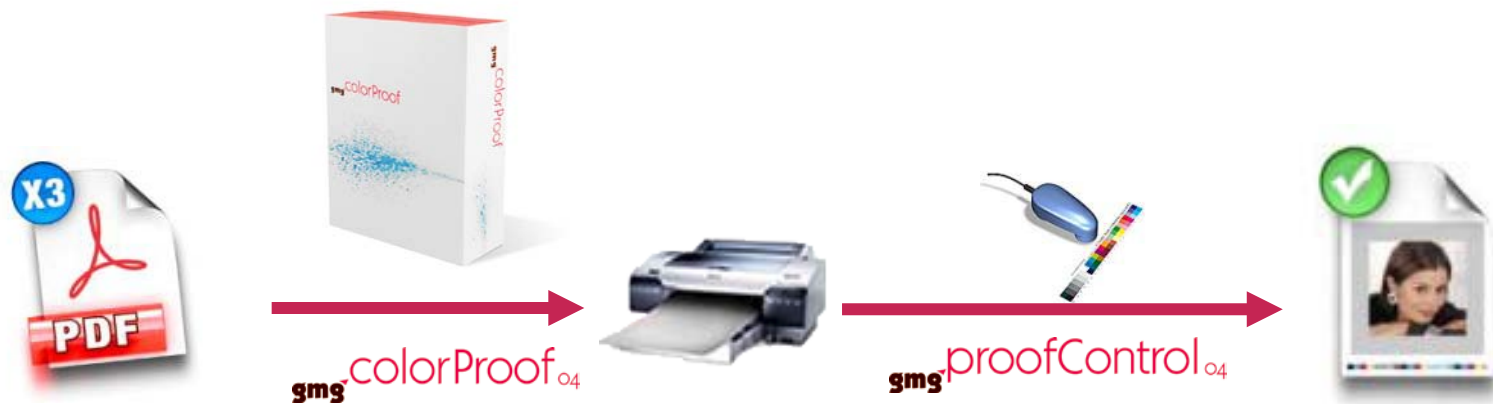


4 – Data and color conversion to different output conditions



5 – Proof of final press data

- ▶ Creation of a GMG hardcopy contract-proof with GMG ColorProof of the final press data.
- ▶ Legally binding verification and certification according ISO 12647-7
- ▶ Usage of the verified contract-proof at the press



Overview

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Most important: The used GamutMapping

- ▶ Keep the image impression of RGB in a different color space
- ▶ Keep color as well as separation comparable coming from RGB or from CMYK
- ▶ Keep the image context on a page – different image sources
- ▶ Keep modulation in saturated areas
- ▶

What is behind? ... is a how-to:

- ▶ Adjust the Hue angles
- ▶ Do the L^* compression
- ▶ Adapt the neutral grey
- ▶ Keep colors differentiation
- ▶ Keep a common appearance
- ▶ Add contrast
- ▶ ... Define a dynamic “percolute” intent

Thank you for listening



Wherever



a



color



goes



it



stays



that



color