6 things about color and PDF...

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Chair

Steve Carter
Co-chair Packaging Subcommittee
David Zwang, travels around the globe helping companies increase their productivity, margins and market reach. With over 40 years of industry experience, David specializes in process analysis, automation, engineering, and strategic development of firms in the fields of publishing and packaging across the globe. His expertise in production optimization, strategic business planning, market analysis, and related and has transformed many businesses. He is currently the Chairman of the GWG (Ghent Workgroup) and sits on many national and international standards bodies.
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30+ years leveraging technology to elevate packaging graphic production, from design through final print and known as a “Mean Dad!”

Steve has a passion for solving problems using technology. He has years of experience leveraging many different technologies to enhance the graphic design-to-print production process. He has spent the better part of his career in executive and management roles with Phototype, Southern Graphic Systems (SGS), and TSI Graphics, managing strategic initiatives involving technology working directly with printers and CPG companies. He now consults in the industry.

Among his many other work-related activities, he believes strongly in helping drive future technology innovation at the industry level. He currently serves as the co-chair of the Ghent Workgroup Packaging subcommittee, a member of the ISO TC130 WG2 committee, and a member of the EskoWorld Advisory board.
We Want Your Questions!

- Please ask any questions by typing them in the chat window.
- We will answer as many as possible at the end of the session.
- If we don’t have the opportunity or time to answer your question, one of us will get back to you after the session.

Now on with the show!
Common Color Spaces
Common Color Spaces

- RGB
- DeviceGray
- CMYK
- CMYK + Spots
Color Space Relationships
- 2 -

Image/Object Profiles
Profiles – what and why
PDF/X-4

RGB image

- Layout coated offset (sheetfed offset)
- Layout uncoated offset (sheetfed offset)
- Layout newspaper print
- Layout rotation & engraving

GWG2015 PDF/X-4 based

PDF/X-4 CMYK Heatset and coldset printing
output condition: CMYK

PDF/X-4 RGB Heatset and coldset printing
output condition: CMYK

Exclusively native PDF RIP processing
PDF/X-6 (future)
- 3 -

Transparency
What is Transparency?

- Technically called Native Transparency, which is also called vector-based transparency, is a useful tool available in many illustration and page layout programs. These tools provide the ability to add transparent effects to design objects that can greatly enhance the creative palette. Things like vignettes, drop shadows, feathered edges, glows, etc., are all examples of Native Transparency. All Native Transparency is part of Blending Modes in PDF terms.
• **What is Opacity?**
  
  - Opacity: Opacity is technically part of blending modes in PDF terms. It describes the properties of a color and how it should react (blend) with other colors (or objects) below it in the PDF file. It is typically used in conjunction with transparency for artistic effects.
Difference between Opacity and Transparency

The first important thing to understand is that transparency and overprint are not the same thing. Transparency is used primarily to create artistic effects like shadows and feathering, which is different than just overprinting. Opacity determines how much of the color (or effect) overprints the underlying object or color. In other words, it determines how the underneath color or object is affected by the transparency effect and how it is to be seen in the final output or rendering.
Don’t believe everything you see in Acrobat

• File as built in Illustrator

- Pantone 876
  - Pantone 877 - 50% opacity
- Pantone 871
  - Pantone 814
  - Pantone 8281
- Pantone 877 - 50% Tint
  - Pantone 8062
  - Pantone 877 - 50% opacity

Note: All 800 Pantone inks are opaque colors

Note: This is process black ink

Note: There is some hidden text

Note: This is process yellow ink

Pantone REFLEX Blue-Overprint
Don’t believe everything you see in Acrobat

- File shown with overprint preview

Note: All 800 Pantone inks are opaque and set to overprint

Note: This is process black ink

Note: This is process yellow ink set to overprint
Don’t believe everything you see in Acrobat

• File as it was printed

- Pantone 876
  - Pantone 877 - 50% opacity

- Pantone 871
  - Pantone 814
  - Pantone 8281
  - Pantone 877 - 50% Tint

- Pantone 877 - 50% opacity
  - Pantone REFLEX Blue-Underneath
  - Pantone REFLEX Blue-Overprint

Note: All 800 Pantone inks are opaque and set to overprint

Note: This is process black ink

Note: This is process yellow ink set to overprint
Output Parameters
Print Output Parameters

• Output Intent
  – Defines a specific printing condition
  – Encapsulates the print technology to be used (sheet or web offset, flexo, gravure, inkjet, digital press, etc), and the media that it will be printed on
  – Provides the way to set correct expectations and deliver those instructions for processing
  – Standardized intents include SWOP, Fogra27, GRACoL, etc.
  – A PDF/X file must include an “output intent”
  – An output intent contains
    • The name of the output condition
    • Facilitates automated production
Adobe Cloud Color Conflicts

• Application Color Settings can conflict with PDF Output Settings
Adobe Application Color Settings

Key Settings
- Working Spaces
- Color Management Policies

- **Settings:** GWG2015_CMYK_CC_sRGB_ISOCoatedv2-300
  - Advanced Mode

- **Working Spaces**
  - RGB: sRGB IEC61966-2.1
  - CMYK: ISO Coated v2 300% (ECI)

- **Color Management Policies**
  - RGB: Preserve Embedded Profiles
  - CMYK: Preserve Numbers (Ignore Linked Profiles)

- **Conversion Options**
  - Engine: Adobe (ACE)
  - Intent: Relative Colorimetric

- **Use Black Point Compensation**

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PDF Export Settings

Key Settings
• Layers
Resolution and Downsampling

Key Settings
- Communicate with PSP
- GWG presets
Color Conversion!

Key Settings
- Color Conversion or NOT
- Output Intent
Fonts and Flattening

If use PDF/X 1a (shouldn’t)
- The Flattening could be an issue
- 5 -

RIP Settings
RIP Processing

• Honor or Force Intents (embedded profiles)
  – Object intents
    • Pro
    • Con
  – Output intent
    • Pro
    • Con
GWG Output Test Suite
Testing Workflow
GWG Output Suite 5.0

GWG 22.1 – OutPutIntent Change Indicator

If an X is visible the Output Intent of the PDF (ISO Coated v2 300% (ECI)) has been changed.


GWG 3.0 - ICC Source Profile

Rendering Intent: Perceptual
Output Intent: ISO Coated v2 300% (ECI)

If a red X appears, then the Source ICC Profile is not respected.
In case a faint green X is shown, the rendering intent is not respected.

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GWG 23.0 - 4 different Grays

Rendering Intent: Relative Colorimetric with Black Point Compensation
Output Intent: ISO Coated v2 300% (ECI)

If an X (or half of an X) appears, the defined color space is treated differently than DeviceCMYK

Testing Workflow
GWG Output Suite 5.0

Ghent PDF Output Suite 5.0 – CMYK
These test pages should be processed like regular PDF/X-4 print jobs. The pages contain test patches with essential PDF/X features. Errors are identified either with a cross or by a deviation from the integrated reference images. This page only has CMYK and Spot. It does not contain any ICC-based elements.

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Testing Workflow
GWG Output Suite 5.0

Deze testpagina’s moeten verwerkt worden als gewone PDF/X-4 print jobs. De pagina’s bevatten test patches met essentiële PDF/X-4 features. Fouten worden aangegeven met ofwel een kruis of door een afwijking met het geintegreerde referentiebeeld. Alle test patches zijn CMYK en bevatten geen ICC gebaseerde elementen.

GWG 2.0 - Spot to CMYK Overprint

GWG 4.1 - White Overprint Mode

GWG 3.0 - Gray Overprint Patch

GWG 4.2 - White Overprint Patch

GWG 3.1 - Gray Image Overprint (CMYK over Spot)

GWG 4.3 - White Overprint/ Knockout

GWG 8.1 - DeviceN Support (6 colors)

GWG 8.2 - DeviceN Support (6 colors)

Fouten zijn duidelijk zichtbaar vanaf een kijkafstand van 0.5 m. Vage X of contour zijn geen probleem.
### Testing Workflow
GWG Output Suite 5.0

**Ghent PDF Output Suite 5.0 – CMS**

These test pages should be processed like regular PDF/X-4 print jobs. The pages contain test patches with essential PDF/X features. Errors are identified either with a cross or by a deviation from the integrated reference images. This page contains ICCBased elements.

#### GWG 12.0 - 4/2/0/4 SWCMYK

<table>
<thead>
<tr>
<th>Device</th>
<th>SWCMYK</th>
<th>SWCMYK Profile</th>
<th>SWCMYK Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMYK</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CMYK</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CMYK</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### GWG 13.9 - ICC Source Profile

- **RGB factor**: RGB image
- **CMYK factor**: CMYK image

#### GWG 13.5 - ICC based CMYK Overprint

- ICC based CMYK overprint must be compatible with CMYK reference images despite changes as explained in the introduction of this section.

#### GWG 13.5 - ICC based RGB Overprint

- ICC based RGB overprint must be compatible with RGB reference images despite changes as explained in the introduction of this section.

#### GWG 15.1 - Transparency Basic Blend Modes (ICCMixedRGB)

#### GWG 15.4 - Transparency Basic Blend Modes (ICCMixedCMYK)

#### GWG 16.7 - Image Softmask (ICCMixedRGB)

Actual test object

Reference image

#### GWG 17.2 - JPEG2000 compression (ICCMixedRGB)

Errors are clearly visible from a viewing distance of 0.5 m (20 inches). Faint or outlined X are not a problem.

10.10.18
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Introduction

The Ghent PDF Output Suite was created for users who process PDF files in the graphic arts industry, as an aid to determine whether their workflows are behaving conforming the PDF/X standards. These patches can be used by end users of graphic arts equipment as well as developers of applications that handle PDF files.

The suite consists of a series of PDF patches. Each patch tests a specific property of a PDF/X file. The patches can be used on their own but the intention of the suite is that the patches are grouped together (as PDF pages would normally be grouped together within a workflow). It is likely that application settings and RIP settings can have a significant effect on the results.

All the issues tested by these patches are real world issues that can be found in a production environment; however, these patches do not reflect normal production files and the results may in some cases appear extreme. They have been carefully constructed to allow effects that are normally subtle to be seen clearly and unambiguously and this should be taken into account when evaluating the results of any tests based on these patches. On a technical note, all patches conform to either the PDF/X-1a, PDF/X-3 or PDF/X-4 ISO standard but they do not always conform to the Ghent Workgroup PDF/X-Plus specifications.

It is likely that this suite will be updated, new patches will be added, and existing patches will be revised. For this reason the documentation for each individual patch is distributed along with the patch. It is advised to check regularly for updates to the suite on the Ghent Workgroup website at http://www.gwg.org.

Version 5.0 Release Notes

In addition to the patches from version 4.0 in version 5.0 additional patches have been added to test ICC-based objects allowed in PDF/X-4 (ISO 15930-7) in order to test device independent workflows. We have abstained from using ICC based blending spaces in isolated transparency groups since their processing is not clearly defined in PDF 1.6 (base of PDF/X-4).

Contributors

The following members of the Ghent Workgroup have actively contributed patches to version 5.0 of the Ghent PDF Output Test Suite:

- Didier Haazen, VIGC, Flemish Innovation Center for Graphic Communication (B)
- Peter Kleinheider, inpetto (A), representing PDFX-ready
- Stephan Jaeggi, PrePress-Consulting (CH), representing VSD

Questions?

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Thank you!