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## 6 things about color and PDF...

**David Zwang**

Chair

**Steve Carter**

Co-chair Packaging Subcommittee



# David Zwang

Zwang & Company



- 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.



# Steve Carter

Mean Dad Consulting

## Industry Consultant

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!



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# Common Color Spaces



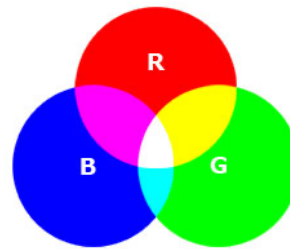
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# Common Color Spaces

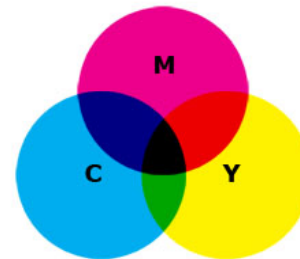
- RGB
- DeviceGray
- CMYK
- CMYK + Spots



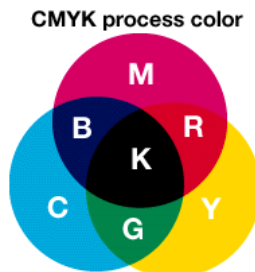
RGB - Subtractive Colors



DeviceGray



CMYK - Additive Colors



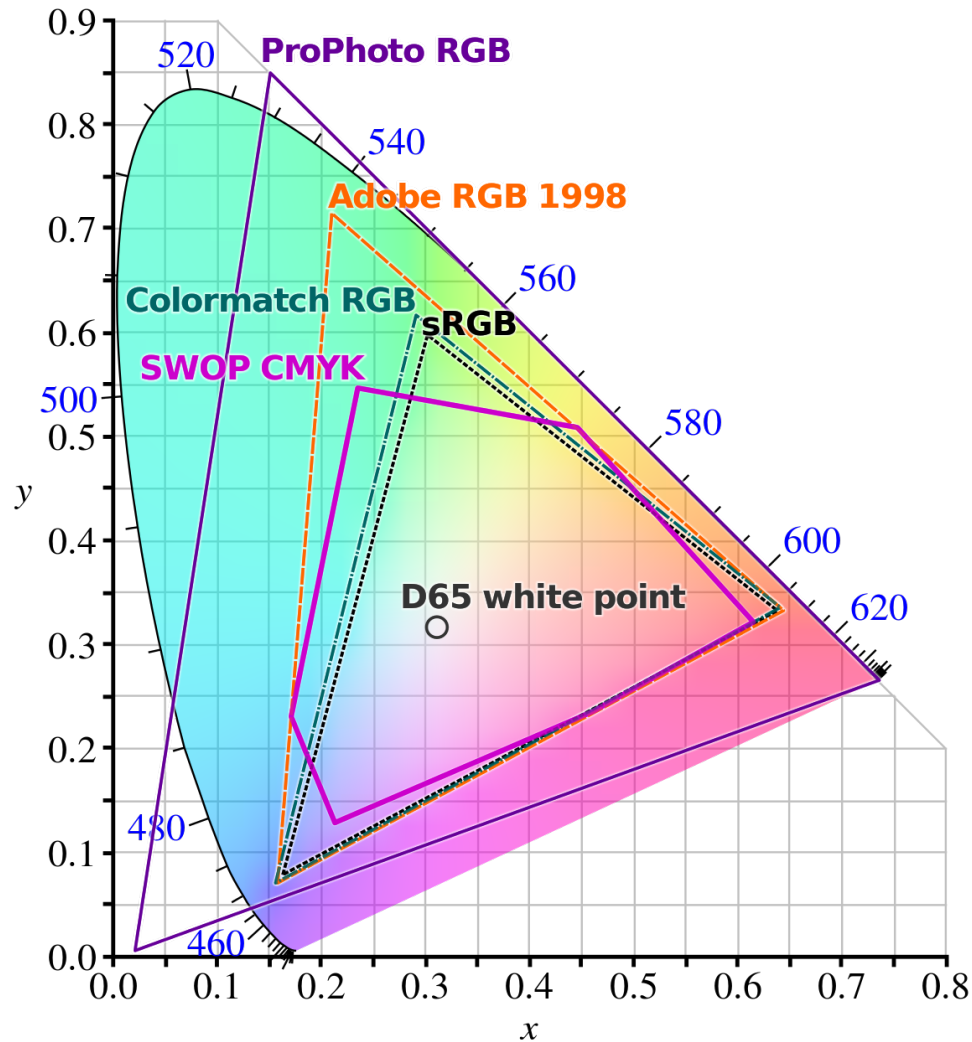
CMYK process color



Spot color



# Color Space Relationships



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# Image/Object Profiles

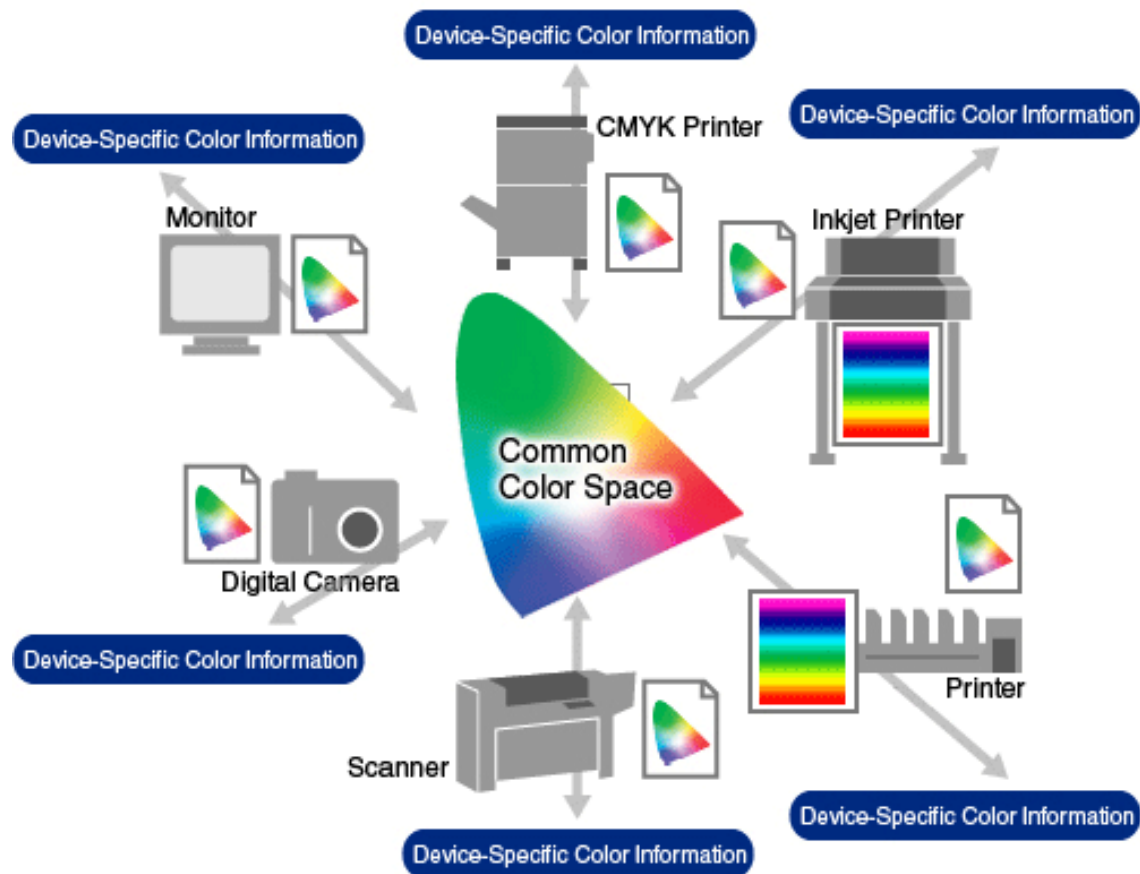


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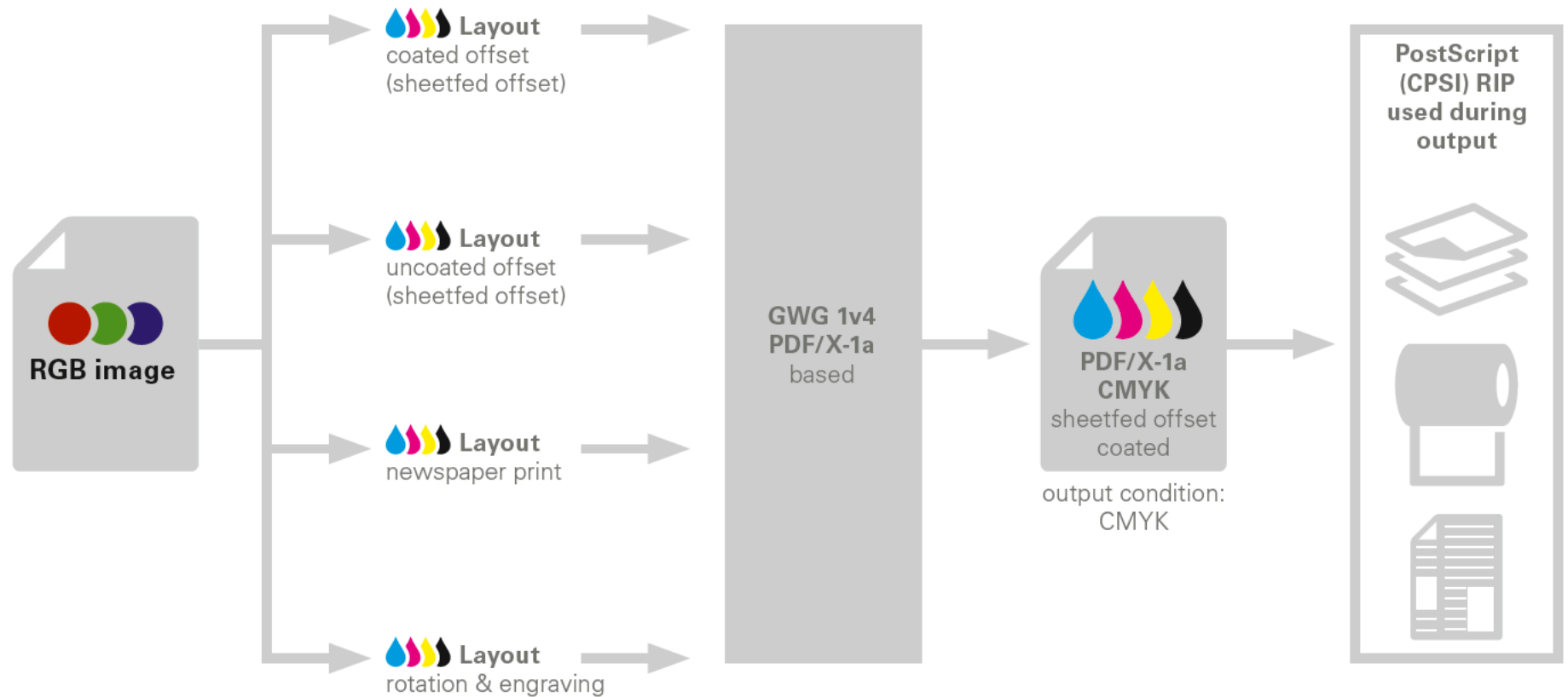
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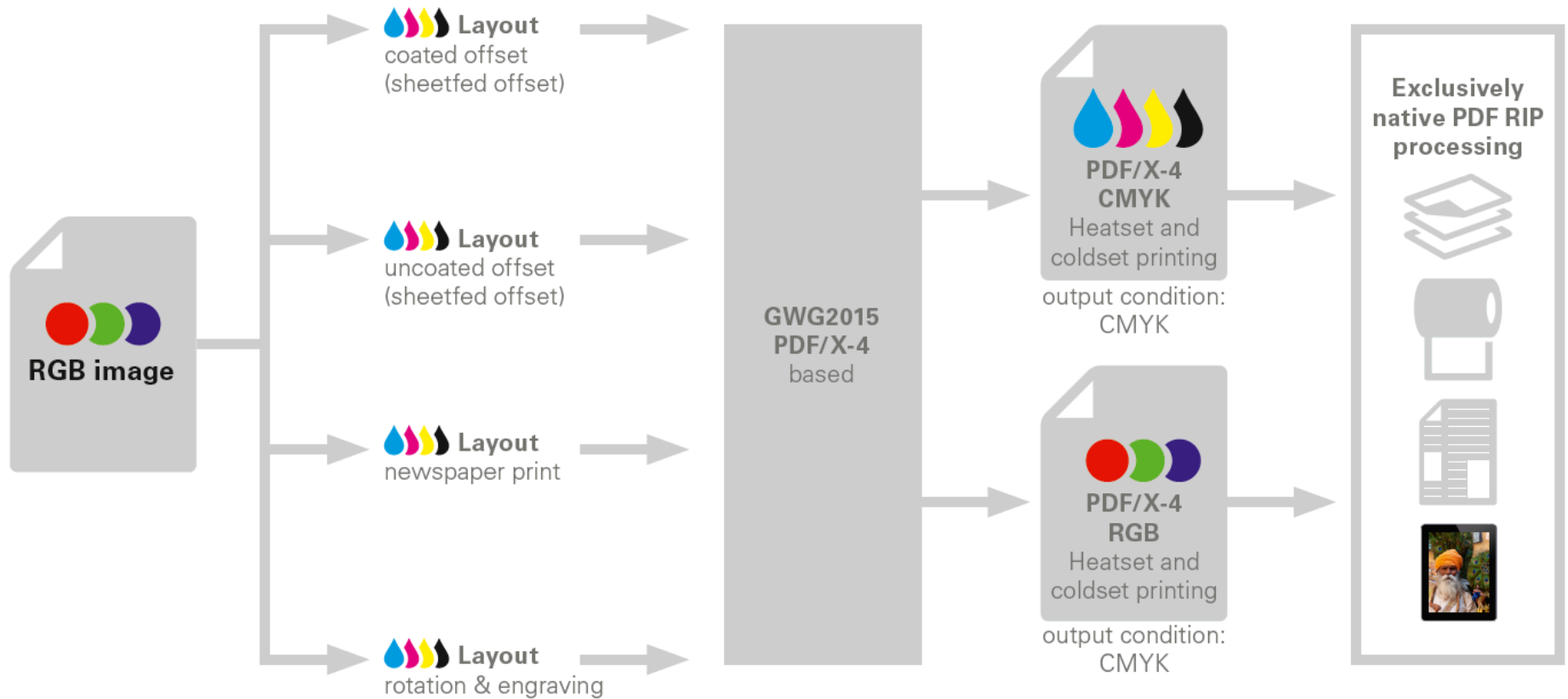
# Profiles – what and why



# PDF/X-1a

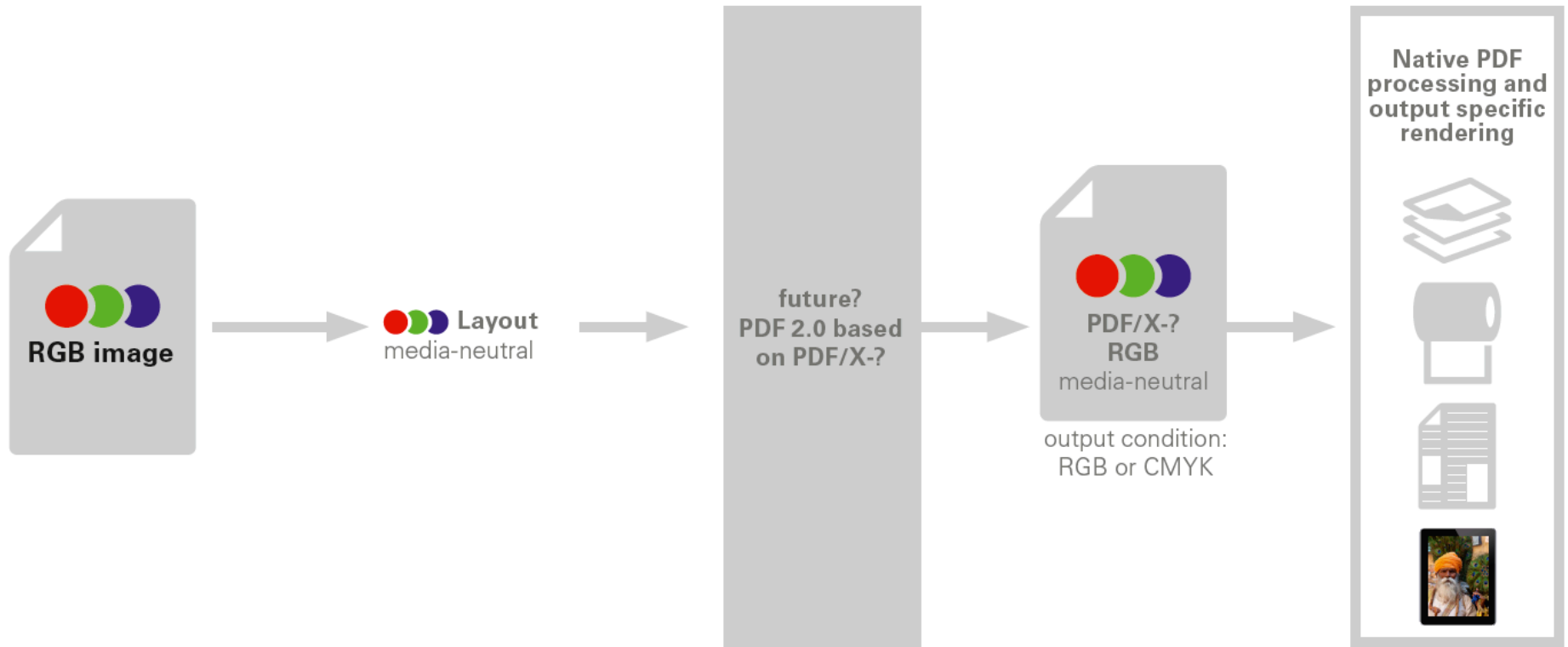


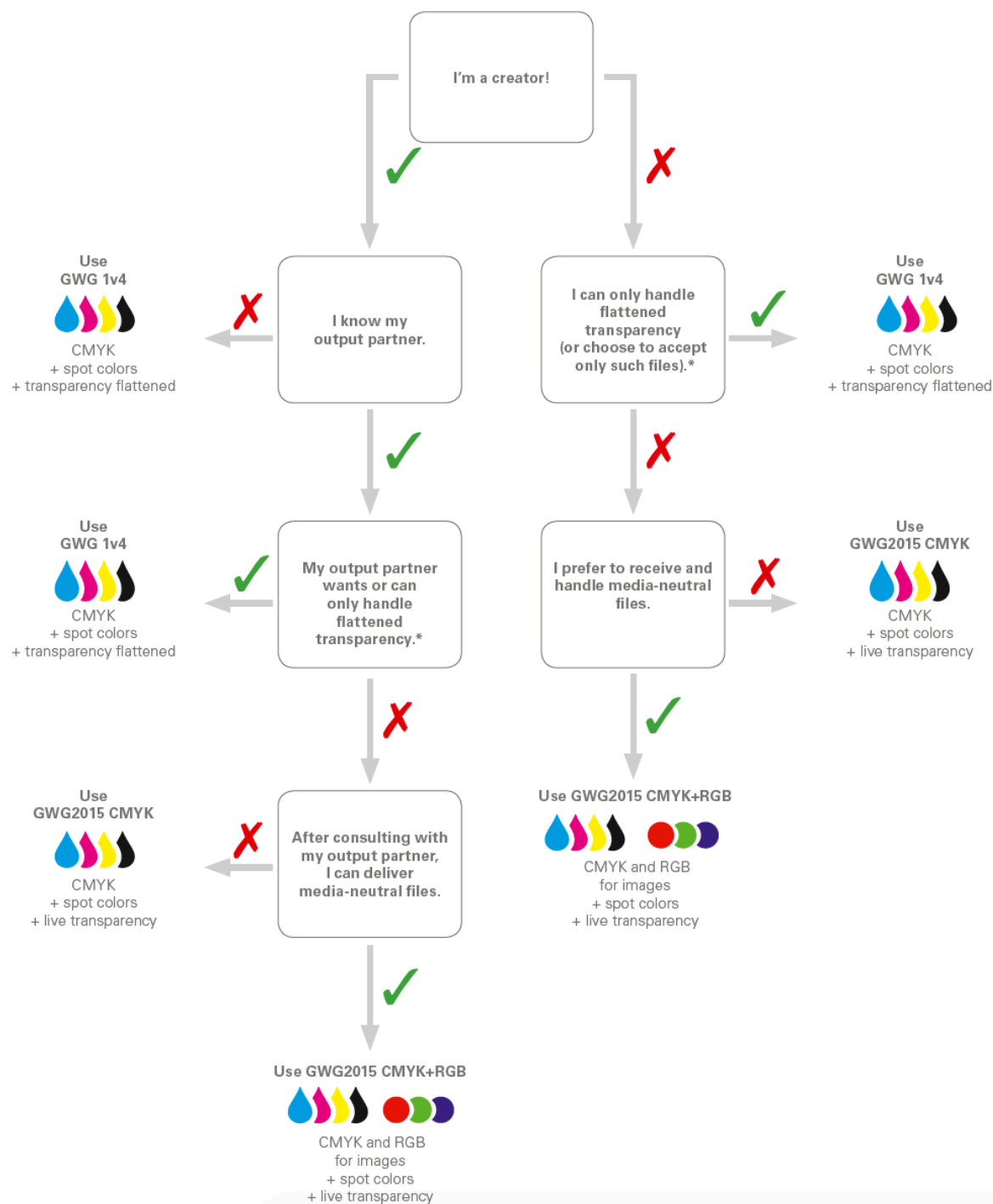
# PDF/X-4





# PDF/X-6 (future)





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# Transparency



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# Transparency & Opacity

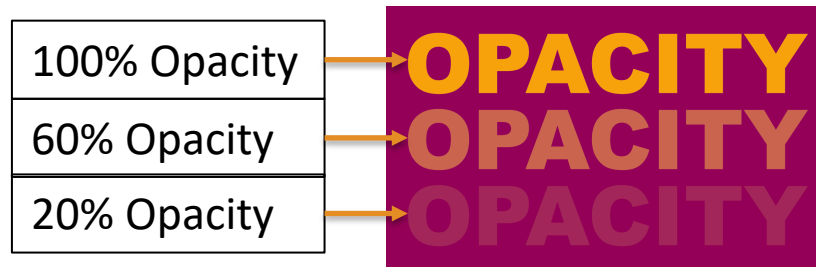


- What is Transparency?
  - Technically called Native Transparency, which is also called vector-based transparency, is a useful tool available in many illustration and page layout programs. These tools provide the ability to add transparent effects to design objects that can greatly enhance the creative 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.



# Transparency & Opacity

- 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.



# Transparency & Opacity

- 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

Note: This is process black ink

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

Note: All 800 Pantone inks are opaque colors

Note: There is some hidden text

Pantone 877 - 50% opacity

**Pantone REFLEX Blue-Overprint**

Note: This is process yellow ink

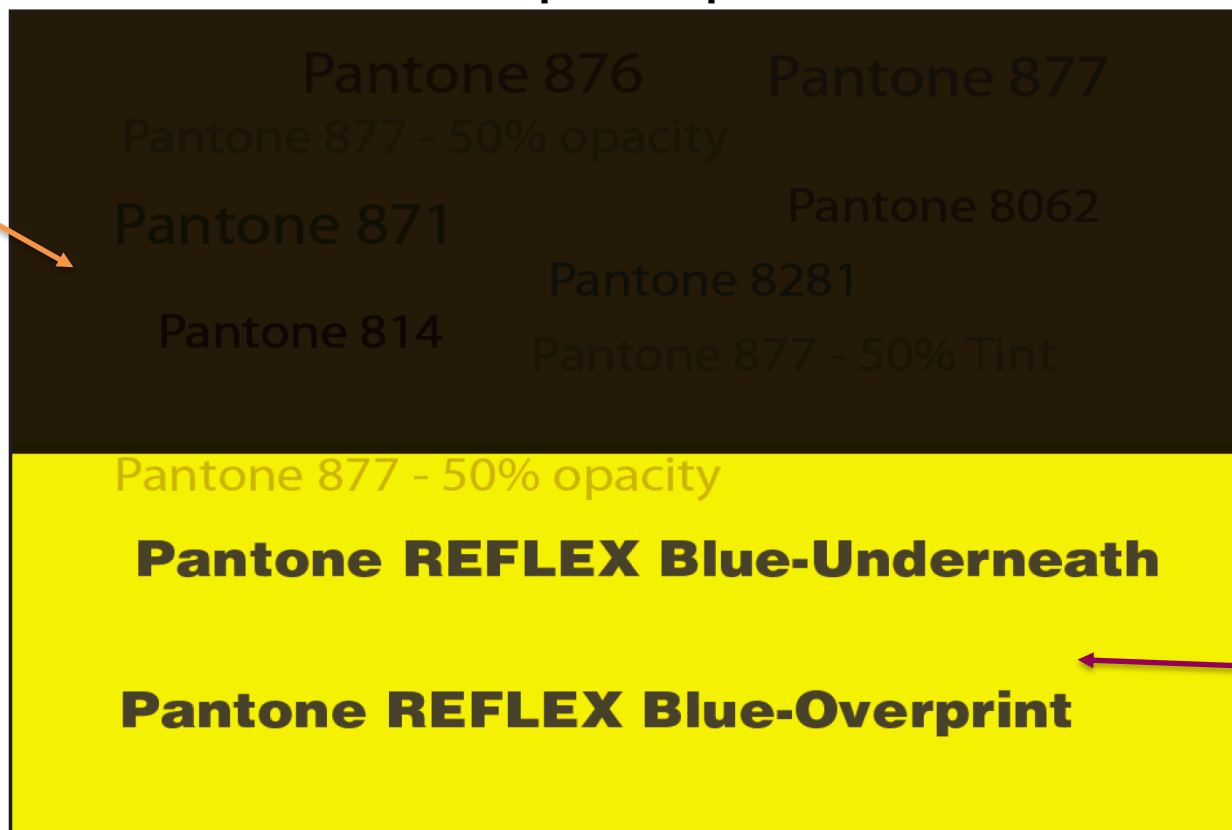




## Don't believe everything you see in Acrobat

- File shown with overprint preview

Note: This  
is process  
black ink



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

Note: This is  
process  
yellow ink  
set to  
overprint



# Don't believe everything you see in Acrobat

- File as it was printed

Note: This is process black ink



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

Note: This is process yellow ink set to overprint

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# Output Parameters



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# Print Output Parameters

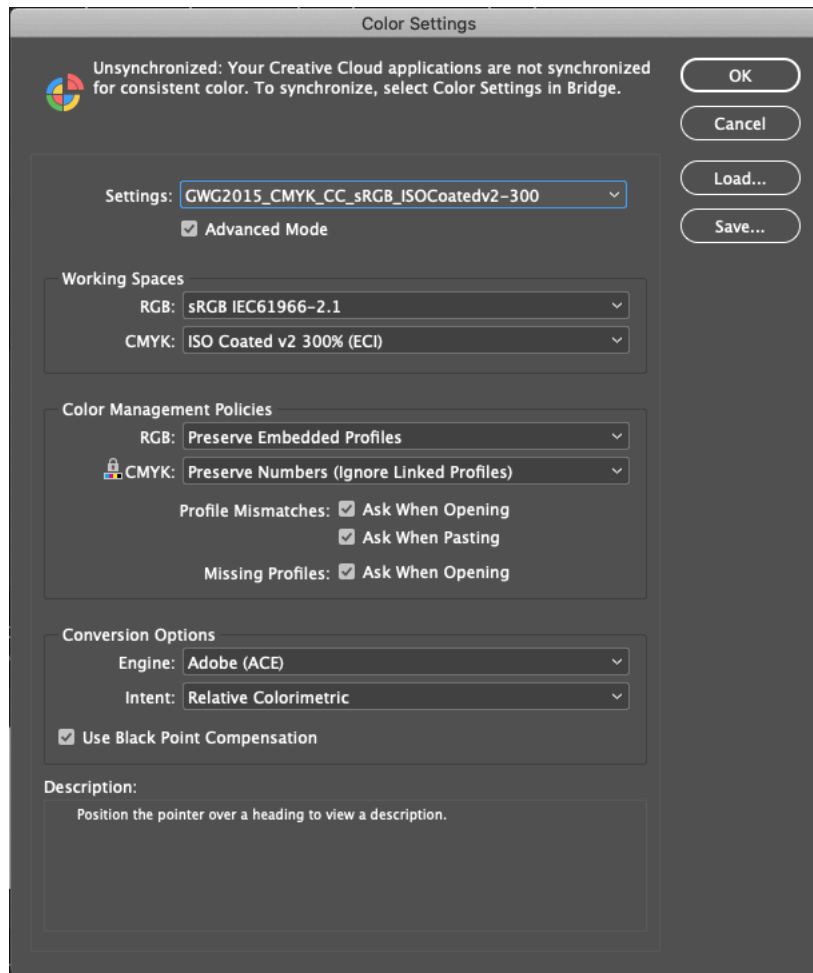
- Output Intent
  - Defines a specific printing condition
  - Encapsulates the print technology to be used (sheet or web offset, flexo, gravure, inkjet, digital press, etc), and the media that it will be printed on
  - Provides the way to set correct expectations and deliver those instructions for processing
  - 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



# PDF Export Settings

Edit PDF Export Preset

Preset Name: **GWG2015\_CMYK+RGB\_Layer\_CC\_350ppi**

Standard: **PDF/X-4:2010** Compatibility: **Acrobat 7 (PDF 1.6)**

**General**

Description: Ghent Workgroup 2015 Specifications – PDF/X-4 compliant. CMYK + RGB images (2015 delivery method). Downsampling to 350 ppi for images with resolution above 700 ppi. Layers are preserved (creating PDF Optional Content).

Pages: ☒ All ☐ Range: **Pages** ☐ Spreads

Export As: ☐ Create Separate PDF Files

Suffix: **Visible & Printable Layers**

Options: ☐ Embed Page Thumbnails ☐ Create Tagged PDF ☒ Create Acrobat Layers

Include: ☐ Bookmarks ☐ Non-Printing Objects ☐ Hyperlinks ☐ Visible Guides and Grids

Interactive Elements: **Do Not Include**

Cancel OK

## Key Settings

- Layers

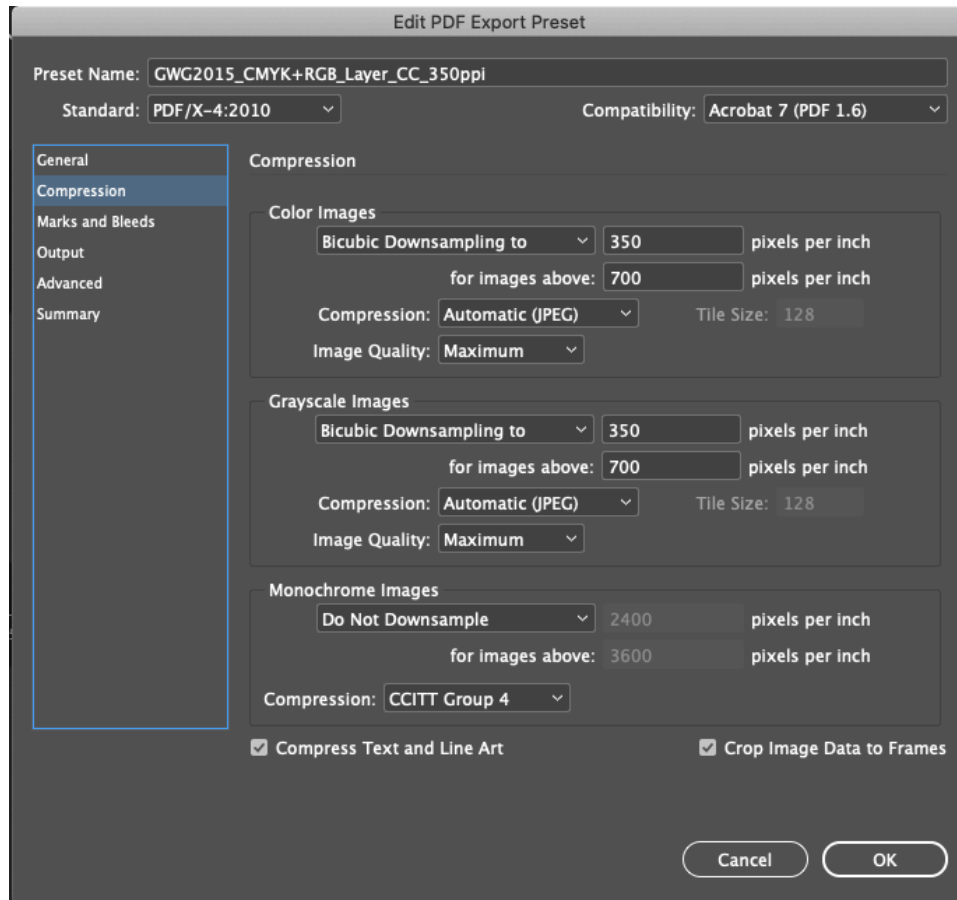


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# Resolution and Downsampling



## Key Settings

- Communicate with PSP
- GWG presets



# Marks Settings

Edit PDF Export Preset

Preset Name:

Standard:  Compatibility:

General  
Compression  
**Marks and Bleeds**  
Output  
Advanced  
Summary

Marks and Bleeds

Marks

☒ All Printer's Marks Type:

☒ Crop Marks Weight:

☐ Bleed Marks Offset:

☐ Registration Marks

☐ Color Bars

☒ Page Information

Bleed and Slug

☒ Use Document Bleed Settings

Bleed:

Top:  Inside:

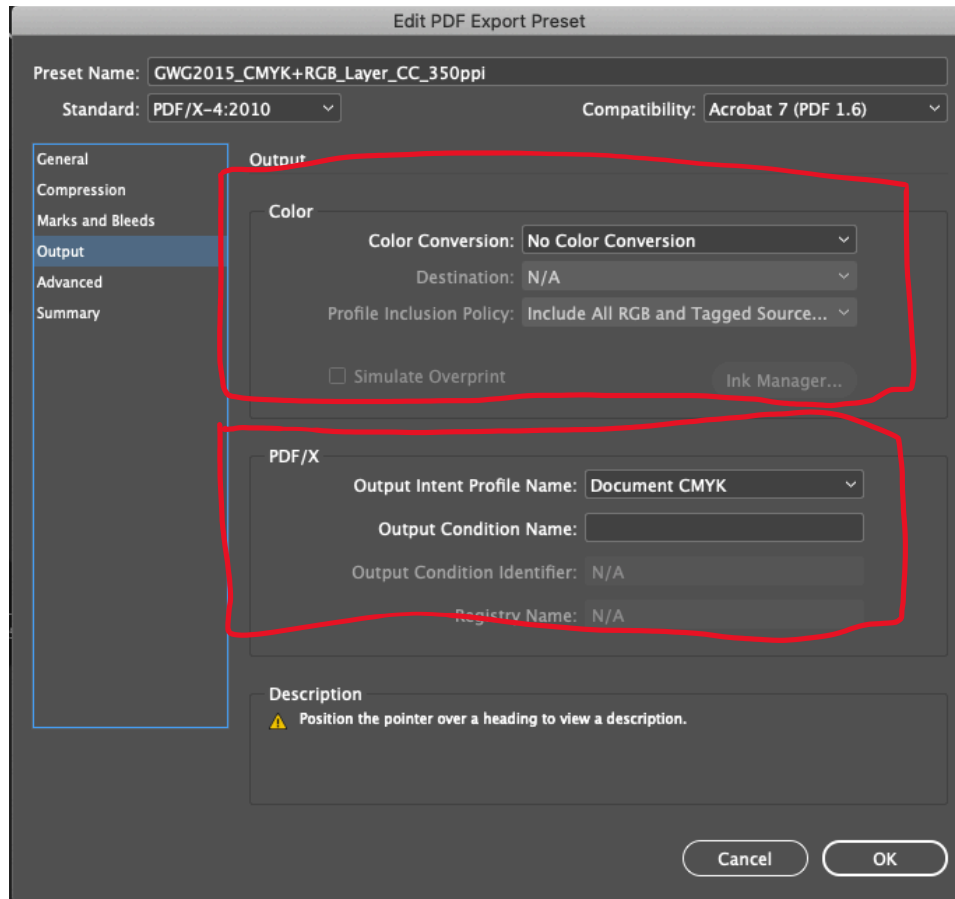
Bottom:  Outside:

☐ Include Slug Area

Cancel OK



# Color Conversion!



## Key Settings

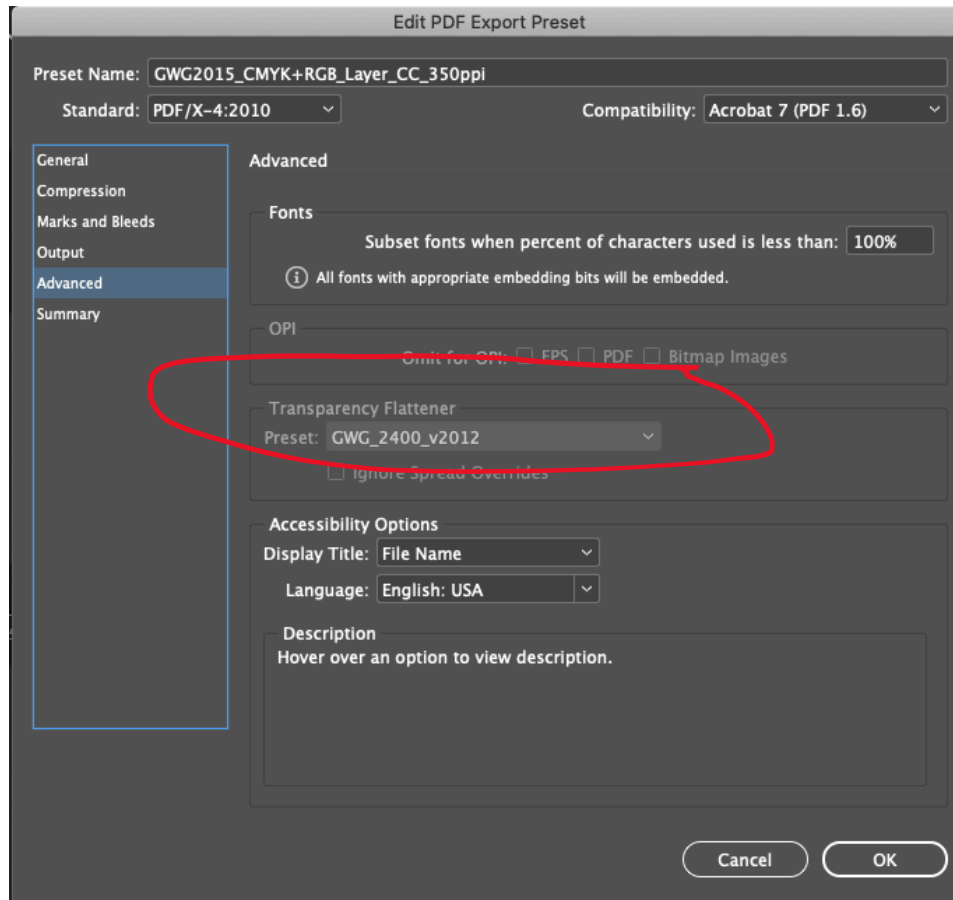
- Color Conversion or NOT
- Output Intent



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# Fonts and Flattening



If use PDF/X 1a (shouldn't)

- The Flattening could be an issue



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# RIP Settings



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# RIP Processing

- Honor or Force Intents (embedded profiles)
  - Object intents
    - Pro
    - Con
  - Output intent
    - Pro
    - Con

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# GWG Output Test Suite



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# 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.

23 Dec 2016 © Ghent Workgroup, www.gwg.org PDF/X-4-ICC 22.1

GWG 13.0 - ICC Source Profile

RGB Vector	RGB Image	CMYK Vector	CMYK Image
a	b	c	d

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

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

03 Mai 2016 Ghent PDF Workgroup © www.gwg.org PDF/X-4-ICC 13.0

GWG 23.0 - 4 different Grays

DeviceGray	DeviceCMYK	Separation	DeviceN
a	b	c	d


25% 0/0/0/75 75 75

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

12 Apr 2016 Ghent PDF Workgroup © www.gwg.org 23.0

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.

23 Dec 2016 © Ghent Workgroup, www.gwg.org PDF/X-4-ICC 22.1

GWG 13.0 - ICC Source Profile

RGB Vector	RGB Image	CMYK Vector	CMYK Image
a	b	c	d

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

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

03 Mai 2016 Ghent PDF Workgroup © www.gwg.org PDF/X-4-ICC 13.0

GWG 23.0 - 4 different Grays

DeviceGray	DeviceCMYK	Separation	DeviceN
a	b	c	d

25% 0/0/0/75 75 75

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

12 Apr 2016 Ghent PDF Workgroup © www.gwg.org 23.0



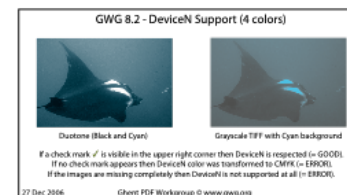
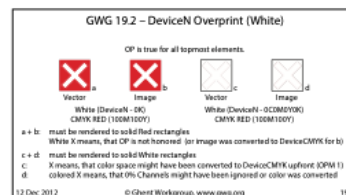
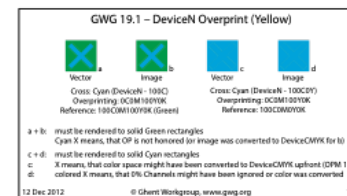
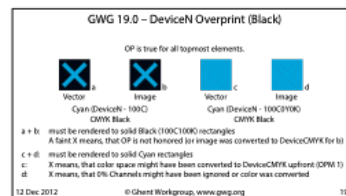
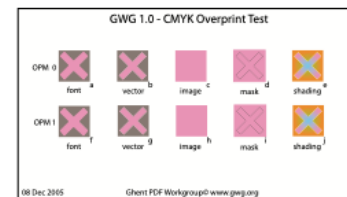
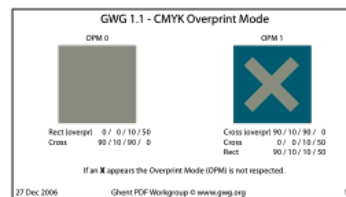
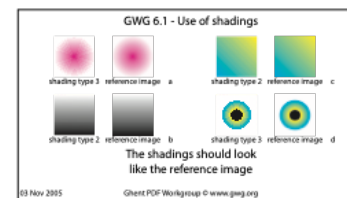
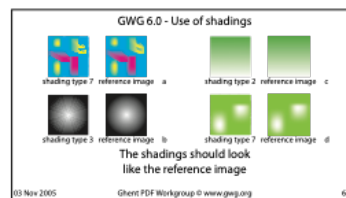
# Testing Workflow

## 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 ICCbased elements.



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



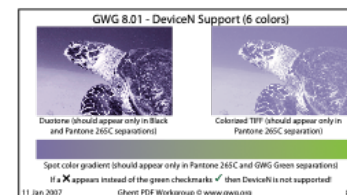
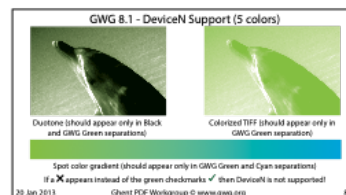
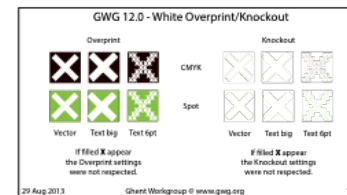
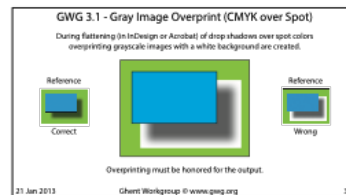
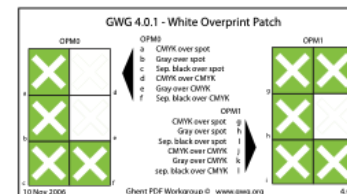
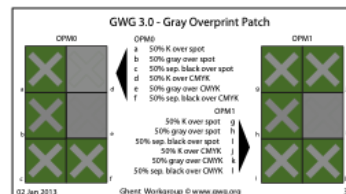
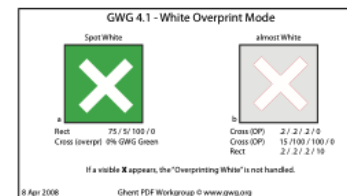
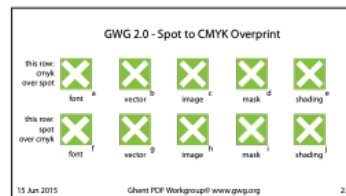
# Testing Workflow

## GWG Output Suite 5.0



### Ghent PDF Output Suite 5.0 – SPOT

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 aangeduid met ofwel een kruis of door een afwijking met het geïntegreerde referentiebeeld. Alle test patches zijn CMYK en bevatten geen ICC gebaseerde elementen.



Fouten zijn duidelijk zichtbaar vanop een kijkaafstand van 0.5 m. Vage X of contour zijn geen probleem.



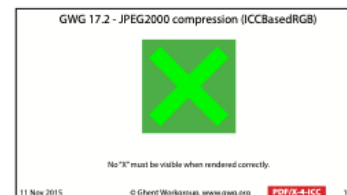
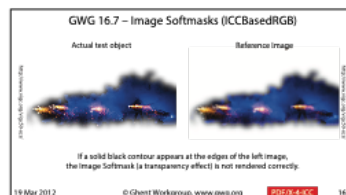
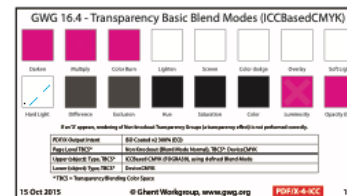
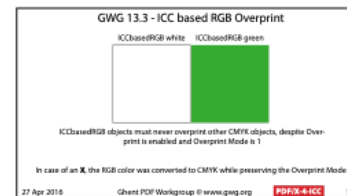
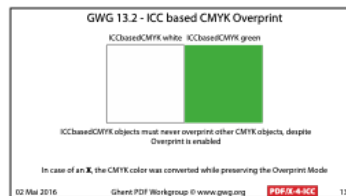
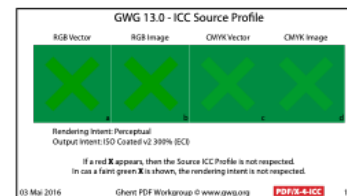
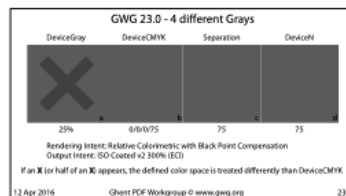
# Testing Workflow

## 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 does contain ICCbased elements.**



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

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# GWG Reference Materials



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# PDF/X Information



<https://www.gwg.org/download/gwg-2015-pdfx-workflow-english/>

# Transparency Information

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## Transparency Best Practices

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**Author** Jason Lisi  
Documentation Officer  
jlisi@ryerson.ca  
**Date** April 12, 2018  
**Status** Reviewed in January 2020



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[www.gwg.org](http://www.gwg.org)

<https://www.gwg.org/download/transparency-best-practices/>

# PDF/X Output Intents Information



PDF/X Output Intents

## PDF/X Output Intents

**Author:** Martin Bailey, [martin.bailey@globalgraphics.com](mailto:martin.bailey@globalgraphics.com)  
Chief Technology Officer, Global Graphics

**Date:** December 18, 2006

**Status:** Final

[https://www.gwg.org/download/pdf-x\\_output\\_intents/](https://www.gwg.org/download/pdf-x_output_intents/)



# Workflow Testing



## Ghent PDF Output Suite 5.0

### 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 ICCbased 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

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<https://www.gwg.org/workflow-tools-downloads/test-suites/ghent-output-suite/>

# Questions?



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# Thank you!



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