

PDF's ISO-standardized subsets: a tour



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- **PDF Association**
 - **Development and education for PDF and PDF based standards**
- **callas software**
 - **Developing PDF software since 1997**
 - **Started with "Preflight" - analysis of PDF for print**
 - **Serving the industries for prepress & print and document processes (ECM, archival)**
 - **Around 75 OEM customers worldwide incl. Adobe, Foxit, Kodak, Quark, Xerox**
 - **Active at ISO in**
 - **TC 130: Graphics arts**
 - **TC 171: PDF in document processes (PDF, PDF/A, PDF/UA)**



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- **PDF**
- **Current PDF based ISO standards**
 - **PDF**
 - **PDF/X**
 - **PDF/A**
 - **PDF/E**
 - **PDF/UA**
 - **PDF/VT**
 - **PDF/VCR**
 - **CxF (spectral measurements)**
- **Upcoming PDF based ISO standards**
 - **Processing Steps**
 - **PDF/raster => PDF/R?**
 - **Print product metadata for PDF files**



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Why PDF based standards (in addition to PDF)

- **PDF is powerful and complex**
 - **Ca. 1000 pages specification**
 - **Referencing many other specifications: Fonts, Unicode, ICC profiles, XMP, ...**
- **Thousands (?) of PDF creators**
- **PDF is not the same as what PDF viewers display**
 - **Not any file that ends with .pdf**
 - **There is correct, not so correct and incorrect PDF**
- **PDF is everywhere and essential for many workflows (archival, print, ...)**
- **The purposes of PDF are many and wherever PDF is essential it is important that each instance of it meets the requirements**



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Aims of PDF based standards

- **Clear and simple rules**
 - **For internal PDF based processes**
 - **For interoperable processes between organizations**
- **Quality assurance for files and documents**
- **Building a reliable technical foundation, relieving users of technical details**
- **Clarifying responsibilities in processes between creator, processor and receiver**



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- **Formal process**
- **Working groups and task forces have projects: Standards**
- **Standardization process:**

WD Working Draft

CD Committee Draft

DIS Draft International Standard

FDIS Final Draft International Standard



- **Votings via national standardization bodies**

At minimum one voting to enter the next stage

Yes, Yes with comments, No, Abstain

- **Each stage may have requirements**

Duration

Number of votings

E.g. FDIS does not allow for comments (only Yes or No)



- **Developed in almost 10 years, almost 1000 pages**
- **For the first time completely developed at ISO**
 - **Adobe: PDF 1.0 - 1.7**
 - **ISO: PDF 32000-1 and 32000-2**
ISO 32000-1 almost identical to PDF 1.7
- **Some new features,**
“USPs” of PDF have not changed
- **Some chapters completely rewritten, many clarifications**
- **Foundation for updates of**
 - **PDF/X**
 - **PDF/A**
 - **PDF/E...**
 - **PDF/UA**
 - **PDF/VT**



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- **Oldest PDF based Standard (1999/2001)**
- **EXchange of pre-press files, PDF is pre-product for print**
- **Closely related to print standards, e.g. ISO 12647 for offset**
- **Widely used and accepted**
- **Covers all printing methods**
 - **Too broad?**
 - **Basis for industry standards specializing on print methods:**
 - **Ghent PDF Workgroup**
 - **PDFX Ready**

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/UA
PDF/VCR



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PDF/X Standard parts

- **PDF/X-1a (2001)**
 - **CMYK + spot colors**
 - **Widely used, straightforward**
 - **No transparency, no layers**
- **PDF/X-3 (2002)**
 - **CMYK + spot colors**
+ ICC (device independent colors)
 - **No transparency, no layers**
 - **More flexible (repurposing)**
 - **Higher requirements for**
 - **Processes and devices**
- **PDF/X-4 (2010)**
 - **CMYK + spot colors**
+ ICC (geräteneutrale Farben)
 - **Transparency and layer permitted**
 - **Requires devices that can deal with "live transparency"**
 - **Basis for PDF/VT and PDF/VCR**



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A few words on transparency

Transparency becomes more important:

- More frequently
- More complex



- **Relevant for PDF/A-1 vs. PDF/A-2 too**



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Transparency flattening

	File Size	Number of objects
PDF/X-4: „Original“	8.1 MB	4035 objects
PDF/X-1a: “Transparency flattened	77.6 MB	20703 objects



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Transparency flattening

- **Massive modifications to the internal structure of PDF files**
 - **Frequently results in much bigger files with many more objects**
 - **Text might be replaced by images, so that text search etc. might fail**
 - **Tagging structure invalidated**
 - **Changes to the color model result in changed appearance (spot color to CMYK)**
- **Current processes and RIPs have no issues with “live transparency”**



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Current ISO project: PDF/X-6

- **Similar to PDF/X-4**
- **Annotations permitted if defined with “appearance”**
- **PDF 2.0**
 - **Page based Output Intents**
 - **Black Point Compensation**
 - **Halftone Origin**
 - **Spectral measurements for spot colors (CxF)...**



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Spectral measurements for spot colors (CxF)...

- **Better data to reproduce spot colors**
e.g. for company colors
- **Consistency over different “channels”** (offset, digital print, packaging)

bitkom



Nestlé



KARSTADT

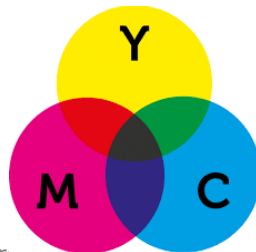
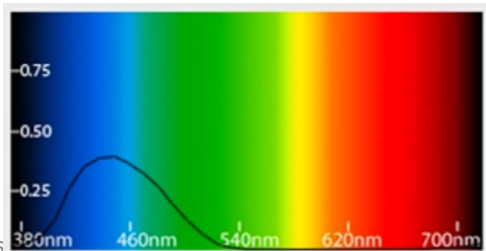


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2018-05-14



- **PDF/A-1 published in 2005**
- **Archival**
- **At first mainly for replacing TIFF in archives**
- **Today increasingly for digitally created documents (Digital Office)**
- **In comparison to PDF/X more than just pre-product for print**
- **Compatible with PDF/X**
- **Works for digital signatures**
- **Mainly in Europe**
- **Also for reliable data exchange between organizations**

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/UA
PDF/VCR



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- **PDF/A-1b and PDF/A-2b**
 - **Forms and annotations: Requirements apply**
 - **Compression: no LZW; JPEG2000 only in PDF/A-2**
 - **Fonts have to be embedded**
 - **Colors need to be defined device independent**
 - **Requirements for metadata based on XMP**
 - **Transparency only in PDF/A-2**
 - **Layers only in PDF/A-2**
- **PDF/A-1a and PDF/A-2a**
 - **Plus tagging structure and unicode (text search)**
- **PDF/A-2u**
 - **Unicode (text search)**



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Special case: PDF/A-3

- **Published 2012**
- **Identical to PDF/A-2 - except:**
**Any file formats may be embedded,
for that reason not “automatically” archivable**
- **More than paper documents**
 - **Digital dossiers**
Similar to a ZIP container but easier to use
 - **Source files**
 - **Structured data in PDF (XML, JSON)**
Example: Hybrid invoices, ZUGFeRD



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Current ISO project: PDF/A-4, PDF/A-4f and PDF/A-4e

- **Relaxed requirements for metadata and font subsets**
- **Based on PDF 2.0**
 - **Current state-of-the-art signatures**
 - **Improved Tagging**
 - **PDF/A-4 as successor of PDF/A-2**
 - **PDF/A-4f as successor of PDF/A-3**
 - **PDF/A-4e as successor of PDF/E...**



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PDF/E will become PDF/A-4e

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/UA
PDF/VCR

- **PDF/E**
 - **Published in 2008**
 - **Exchange format for 3D drawings**
 - **Almost no practical use**
- **Industry has an interest in an archivable format for drawings**
 - **Car manufacturers standardize the use of PDF/A-3 for that purpose**
 - **Prefers to have this under the hood of PDF/A**
 - **ISO has ceased further work on PDF/E-2**
- **PDF/A-4e**
 - **3D-Formats: U3D und PRC**



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- **PDF/VT published in 2010**
 - **PDF/VT-1: Complete files (thousands of pages)**
 - **PDF/VT-2: Referenced (variable) objects**
- **Exchange format for variable and transactional print**
- **Trends in print:
Digital print and individualization**
- **Based on PDF/X-4**
- **Compared to PCL, PPML, AFP, etc.**
 - **Enhanced graphical model**
 - **Widely available viewers**
- **Not very much in use...**

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/VCR
PDF/UA



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- **Allows for page based metadata definitions, but defines only syntax, no semantical model**
 - **No interoperability for printer control**
e.g. paper tray selection
 - **No interoperability for finishing**
e.g. inline binding
- **Current ISO project:**
"Print product metadata for PDF files" (ISO 21812-1)
...
- **Current ISO project: PDF/VT-3**
 - **Based on PDF/X-6**



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- **Relatively new, published in September 2017**
- **Driven from existing implementations**
- **Similar scope as PDF/VT**
- **Applicable to “real time” printing,
e.g. read data from a credit card and
use it when printing the envelope**

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/VCR
PDF/UA



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- **UA = universal accessibility**
- **Published 2014**
- **Accessibility “baked in” into HTML and eBooks formats**
- **In PDF structure via “tagging”**
- **Accessible documents are required by law (public sector, insurance companies etc.)**
- **Can be combined with other PDF based Standards**
- **Tagging is also the basis for device dependent publishing (next generation PDF)**

PDF/X
PDF/A
PDF/E
PDF/VT
PDF/VCR
PDF/UA



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- **Technical basis for unicode is PDF/A-2u**
- **Syntactical and semantical requirements for tagging structure**
 - **Tags similar to HTML**
 - **Headlines, paragraphs, columns, tables**
...
 - **Alternate text for images and diagrams**
- **Automated tagging in PDF not permitted, because not reliably possible**
- **Instead creation and export from the authoring applications (editorial systems, office or layout applications)**



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- **PDF**
- **Current PDF based ISO standards**
 - **PDF**
 - **PDF/X**
 - **PDF/A**
 - **PDF/E**
 - **PDF/UA**
 - **PDF/VT**
 - **PDF/VCR**
 - **CxF (spectral measurements)**
- **Upcoming PDF based ISO standards**
 - **Processing Steps**
 - **PDF/raster => PDF/R?**
 - **Print product metadata for PDF files**



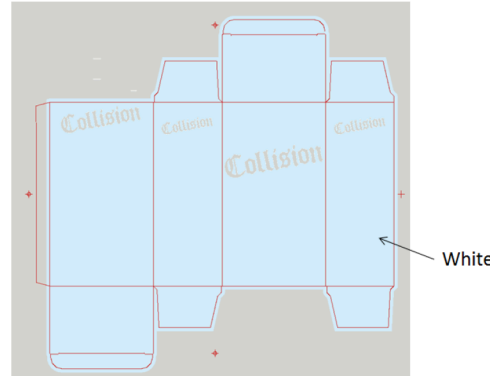
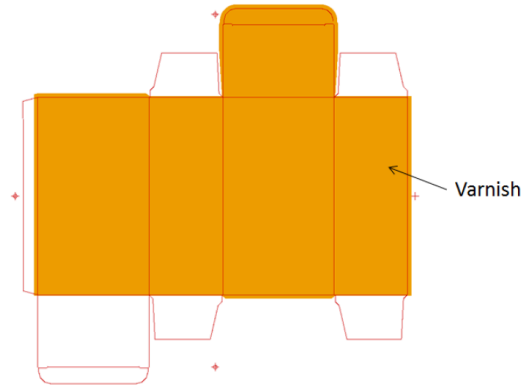
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ISO 19593-1: Processing Steps - will be published soon



Standardizing layers via metadata values

Identify objects related to Processing Steps which are not print

Presentation
Tuesday 13:30 in
"PDF for users"

Introducing ISO standards
for PDF "processing steps"
and "print product metadata"



ISO ????: PDF/raster -> PDF/R - may be published in 2019

- **Collaboration of TWAIN with PDF Association (TWAIN: Workgroup for standardized communication between scanner devices and applications)**
- **Replacement for TIFF/JPEG**
 - **Multiple pages**
 - **Better compression**
 - **Better, widely available viewers**
- **Strongly limited in PDF features**
- **Certain additional requirements to serve communication needs**
- **One-, two or RGB colored pages**
- **Current ISO project: PDF/R**



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ISO 21812-1: Print product metadata for PDF files may be published in 2019/2020

- **Standardizes metadata fields to be used in DPart structures**
- **Based on XJDF, a common standard for jobtickets in the prepress and print world**
- **Examples:**
 - **CIP4_Recipient** **Address information for recipient of pages, e.g. invoices**
 - **CIP4_ProductType** **E.g. "Booklet", "Brochure"**
 - **CIP4_MediaIntent** **The media that shall be printed**



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Presentation Tuesday 13:30 in "PDF for users":
Introducing ISO standards for PDF "processing steps" and "print product metadata"



PDF based ISO Standards



Standard	Published	Scope	Use
PDF/X	2001	pre-product for print	very high
PDF/A	2005	digital archival	high
PDF/E	2008	engineering	none
PDF 1.7	2008	PDF becomes ISO Standard	high
PDF/VT	2010	variable, transact. printing	low
PDF/UA	2014	accessibility, richer docs	some
PDF/VCR	2017	variable print in real time	low
PDF 2.0	2017	PDF up to date	implementations
Processing Steps	2018	packaging and label print	implementations
PDF/raster	2018	scanner	implementations
PDF/R	2019		
Print product metadata	?	standardized page metadata for print production	-



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Thank you!

Any questions?

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