



ITHS INFORMATION
TECHNOLOGY
HIGH SCHOOL
SREDNJA ŠKOLA ZA INFORMACIONE TEHNOLOGIJE
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PDF/**raster**

PDF/**X**-5pg

PDF/**A**-4f

PDF subset
Uppercase letters = ISO
Lowercase = Industry

Version of subset
(optional)

Subset Conformance
Level(s)
(optional, lowercase letters)

Dictionary of Terms

Action	PDF feature enabling automatic behaviours triggered by a user interaction or event (e.g., change to a different page when a bookmark is clicked, follow a URL hyperlink, etc.).
AT	Assistive Technology. Associated with PDF/UA and Tagged PDF.
BBox	Bounding Box. A common key name.
Conformance level	Represented by letter designators after a PDF subset acronym, (e.g., PDF/A-1b, PDF/X-5pg, PDF/VT-2s). Each Conformance Level has its own specialized set of rules and requirements.
COS	Carousel Object Syntax. The syntax used by PDF and FDF files. "Carousel" was the codename for Acrobat 1.0.
Cross-reference stream	(PDF 1.5 and later only) Cross-reference information stored in a stream instead of a standard cross-reference xref table. Trailer dictionary entries are in cross reference stream dictionary.
Destination	An object defining a view of a document, comprising a page, the location of the document window on that page, and zoom factor.

User Password	Password with restricted access permissions (as set by an author).
Widget	A subtype of PDF annotation used with interactive forms that represent the GUI "widgets" through which data entry is done.
XFA	XML Forms Architecture. Proprietary XML-based specifications supporting dynamic forms. Deprecated in PDF 2.0.
XFDF	XML-based version of FDF defined by ISO 19444-1.
XMP	eXtensible Metadata Platform. XML-based metadata standard (ISO 16684) used by many file formats. Required by PDF subsets and PDF 2.0.
xref	Reserved PDF keyword that indicates the start of a standard cross-reference table. Often shorthand for "cross reference table".

Direct object	PDF object that occurs inline where it is defined and does not have its own object identifier (object number and generation number pair).
FDF	Forms Data Field file format to store interactive form data
Hybrid-reference PDF	(PDF 1.5 and later only). PDF containing objects referenced by conventional cross-reference tables in addition to objects in object streams referenced by cross-reference streams.
Linearized PDF	Commonly referred to as Fast Web View.
obj	Object abbreviation. A reserved PDF keyword.
Object stream	(PDF 1.5 and later only). A stream in which indirect objects may be stored, as an alternative to being stored in PDF body sections.

OCG	Optional Content Group. A selectable "layer" of page content.
Owner Password	Password with full (owner) access, including ability to change passwords and access permissions of the PDF document.
PAdES	PDF Advanced Electronic Signatures. ETSI standard EN 319 142.
Page Label	Optional descriptive text for referring to pages that can be shown on-screen (e.g., i, ii, iii, ..., Chapter 1, Chapter 2, etc). This contrasts with the zero-based integer page index used internally in PDF files.
startxref	Reserved PDF keyword that occurs just before the %%EOF end-of-file comment marker along with the byte offset to the cross-reference data for the PDF file (expressed as an integer in ASCII).
trailer	The trailer dictionary is required in every PDF and defines special objects (e.g., largest object number, the Document Catalog root). Also keyword.



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PDF TERMINOLOGY

Standard
Organization(s)

ISO 32000-2:2020

Year of
Publication

Unique Document
Number

Part Number
(optional)

ITHS Cheat Sheet – PDF

PDF 2.0

ISO 32000

Latest core PDF specification that applies to all PDF files. Fully vendor-neutral specification of every non-obsolete PDF feature since PDF 1.0.

PDF/A

ISO 19005

Archival. PDF for the long-term preservation of static page appearance.

PDF/X

ISO 15930

eXchange. PDF for graphic arts and professional printing workflows including packaging and labelling.

PDF/UA

ISO 14289

Universal Accessibility. PDF supporting accessibility and assistive technology such as screen readers for those with vision impairments.

PDF/R

ISO 23504

Raster. Simplified PDF that uses banded images and that is easy to create by low-resource embedded devices such as consumer flatbed scanners. ISO version of PDF/raster.

PDF/VT

ISO 16612

Variable/Transactional for high-speed variable data (VDP) and transactional printing in the graphic arts and professional printing industries. Builds on PDF/X.

PDF/VCR

ISO 16613

Variable Content Replacement. Templated PDF/X supporting late-stage variable content merging, such as adding batch numbers on pharmaceutical packaging.

PDF/E

ISO 24517

Engineering. PDF 1.6 based subset to support engineering-centric 3D PDF workflows such as aerospace and automotive engineering. Superseded by PDF/A-4.

LEXICAL STRUCTURE

End-of-Line (EOL) Sequences

0x0D	Carriage Return (CR) only
0x0A	Line Feed (LF) only
0x0D	0x0A Carriage Return (CR) followed by Line Feed (LF) only

White space

0x00	Null byte
0x09	Horizontal Tab (HT)
0x0C	Form Feed (FF)
0x20	SPACE
EOL	Any End-of-Line sequence (see above)
% ...	PDF comments (starting from % to EOL) are treated as single white space

Token Delimiter symbols

(	Literal string start token
)	Literal string end token
<, <<	Hex string start token / dictionary start (<<) token
>, >>	Hex string end token / dictionary end (>>) token
[	Array start token
]	Array end token
/	PDF name
%	Comment to end-of-line (outside of a string or inside a content stream)
{	<u>Only</u> in Type 4 PostScript calculator functions
}	<u>Only</u> in Type 4 PostScript calculator functions



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Reserved Keywords (case sensitive)

endobj, endstream, f, false, n, null, obj, R, startxref, stream, trailer, true, xref

Objects

Boolean	true false	• Case sensitive keywords.																				
Integer	0 123 +045 -67890	• Signed decimal integer. • No hexadecimal or octal integers.																				
Real Number	1.23 -45.6 +7.8 -.9 0.	• Signed decimal floating-point numbers. • No exponential or scientific formats. • Integers can be used for real numbers.																				
String	(literal string) (balanced () ok) (unbalanced \() (line \ break) (line \nbreak) (octal \234 code) <hex-string> <48656c6c6F> <41424> % 0 added	• Encrypted PDFs encrypt string objects. • Unicode strings with byte order markers. • Backslash escape sequences for literal strings: <table><tr><th>Sequence</th><th>Meaning</th></tr><tr><td>\n LF</td><td>(0x0A)</td></tr><tr><td>\r</td><td>CR (0x0D)</td></tr><tr><td>\t</td><td>Horizontal Tab (0x09)</td></tr><tr><td>\b</td><td>Backspace (0x08)</td></tr><tr><td>\f</td><td>Formfeed (0x0C)</td></tr><tr><td>\)</td><td>Left parenthesis</td></tr><tr><td>\)</td><td>Right parenthesis</td></tr><tr><td>\\</td><td>Backslash</td></tr><tr><td>\</td><td>Octal code. 1-3 digits</td></tr></table>	Sequence	Meaning	\n LF	(0x0A)	\r	CR (0x0D)	\t	Horizontal Tab (0x09)	\b	Backspace (0x08)	\f	Formfeed (0x0C)	\)	Left parenthesis	\)	Right parenthesis	\\	Backslash	\	Octal code. 1-3 digits
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\)	Right parenthesis																					
\\	Backslash																					
\	Octal code. 1-3 digits																					

Name	/CaseSensitive12 /HashSign#23	• Start with / SOLIDUS (0x2F). • Can use # followed by 2 hex digits.
Array	[/AName true null -1.23 10 0 R ...] [] % an empty array	• One dimensional ordered collection with zero or more elements. • Array elements can be any type of object.
Dictionary	<< /KeyName value ... >>	• Associative unordered table containing key/value pairs known as an entry. • Keys must be unique direct name objects. • If value is null then same as if key does not exist.
Stream	10 0 obj << /Length int ... >> stream ...stream data... endstream endobj	• Contains zero or more stream data bytes. • Always need a stream dictionary. • Stream data can be compressed and/or encrypted using Filters. • Always an indirect object. • Cannot be in object streams. • Encrypted PDFs encrypt stream data.
Null object	null	• Case sensitive reserved keyword.
Indirect Reference	10 0 R	• Object number then generation number. • Method to refer to another object.



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Common terms

Bookmarks	Outlines which use Actions or Destinations.
Comments	Markup annotations.
Compression	Filters on streams. Object streams. Cross reference streams.
Fast Web View	Linearization.
Files	Embedded Files (incl. media) and File Attachment annotations.
Forms	Widget annotations and Fields. Also referred to as AcroForm.
Hyperlinks	Link annotations, URI actions. Actions and Destinations.
JavaScript (JS)	ECMAScript for PDF (ISO 21757). ECMAScript Actions.
Layers	Optional Content (OC), Visibility Expressions. Marked Content.
Multimedia	3D, Movie, Screen, and RichMedia annotations with Actions.
Page size	The page MediaBox.
Portfolios	Also called Collections or Packages. A collection of embedded files.
Properties	Document Information dictionary and XMP Metadata streams.
Scanned PDF	Images of content such as from scanner or camera. Often has OCR-ed invisible text on top of images allowing text selection
Security	Encryption, Crypt filters, and Digital Signatures.
Tags	Tagged PDF, including Marked Content and Logical Structure.

Key PDF features by version

PDF 1.0	1993	Pure text. Only RGB. Resolution independent graphics.
PDF 1.1	1996	Device-independent color. Article threads. External links. Security. Multimedia. Actions.
PDF 1.2	1996	Prepress features: CMYK, spot color, halftoning, overprinting, OPI (Open Prepress Interface). Flate compression. New types of annotations. Interactive forms.
PDF 1.3	2000	DeviceN color. 2-byte CID fonts. Smooth shadings. More types of annotations. Large media. Page labels. Digital signatures. JavaScript. Alternate images. Masked images.
PDF 1.4	2001	Transparency and blend modes. Improved security. More prepress features. JBIG2 images.
PDF 1.5	2003	JPEG 2000. Layers (optional content). Tagged PDF. Object streams and cross reference streams for better compression.
PDF 1.6	2004	OpenType. Ultra-large media. Watermarking. Visibility expressions. AES encryption. Interactive 3D with U3D. Measurement properties.
PDF 1.7	2006	Portable collections (packages). 3D enhancements. Redaction annotations. Standardized as ISO 32000-1:2008.
PDF 2.0	2017 2020	ISO 32000-2. UTF-8 strings. 256-bit AES-CBC encryption. Unicode passwords. Black point compensation. Rich media annotations. PAdES. PRC for 3D. Geospatial features. Document parts. Associated Files. Metadata streams. Deprecation of older encryption and other legacy features, including XFA.
PDF 2.0 Extensions		256-bit AES-GCM encryption. Extensions to hash algorithms, elliptical curves, integrity protection via MACs. STEP and glTF for 3D. Clarification on PDF 1.7 and PDF 2.0 namespace inclusion.



Internet Media Types

IANA

application/pdf

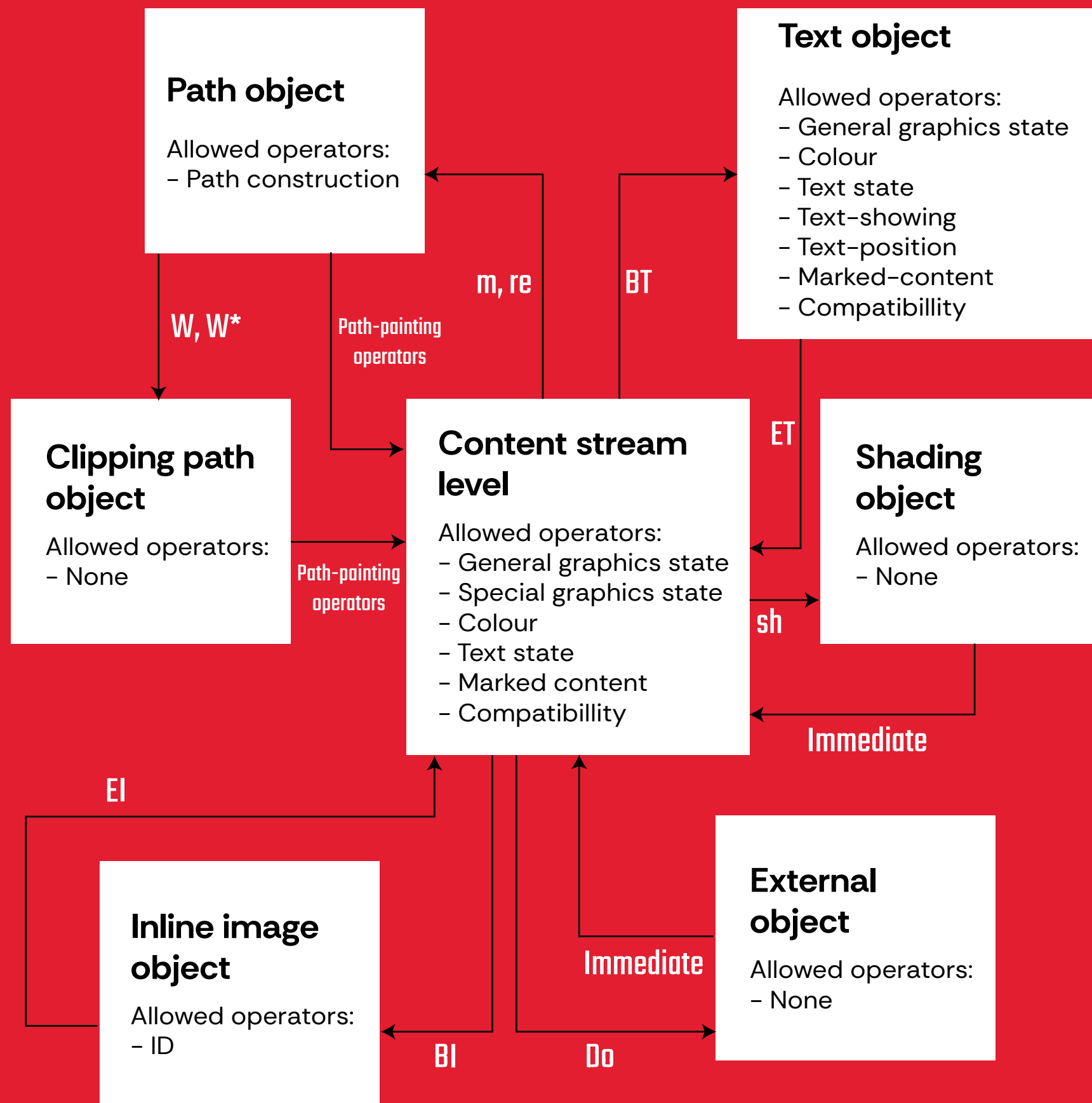
Registered Media Type for all PDF files. See RFC 8118.

application/pdf

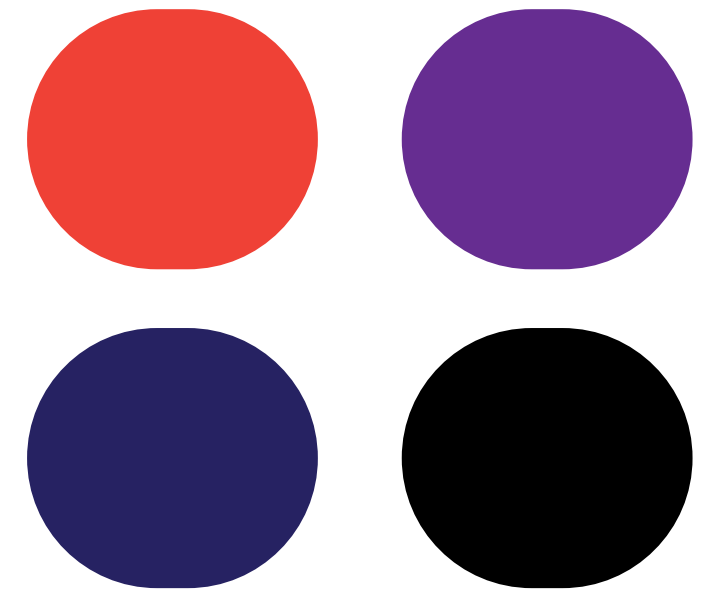
Registered Media Tpe for FDF (Forms Data Field) files. See ISO 32000 for FDF file specification.

application/pdf

Registered Media Tpe for XFDF (XML Forms Data Field) files. See ISO 19444-1 for XFDF file format specification.



PAINTING GRAPHICS



COLOURS

SHADING

POSITION

ROTATION

FILE STRUCTURE

- Subsection = 1st object number, number of object in this cross reference subsection.
- 10-digit byte offset to object
- 5-digit generation number
- **f** = free object
- **n** = in-use object
- object 0 is start of free list
- all entries are exactly 20 bytes including EOL
- no comments in cross-reference sections

- trailer is a special dictionary
- always immediately after end of cross-reference table
- /Root = Document Catalog
- /Size = number of objects + 1
- startxref = byte offset to xref keyword

DOCUMENT STRUCTURE

Header

```
%PDF-2.0
%aaIO
```

```
Linearization data
(optional)
```

```
...
3 0 obj
...
endobj
4 0 obj
...
stream
endstream
endobj
...
```

```
xref
0 7
0000000000 65535 f
0000000016 00000 n
0000000096 00000 n
0000000157 00000 n
0000000289 00000 n
```

```
trailer
<<
  /Root 1 0 R
  /Size 7
  ...
>>
startxref
3987
%%EOF
```

Body section

Cross reference section

Trailer

Document catalog

Page tree

Page

Content stream

Thumbnail image

Annotations

...

Page

Outline hierarchy

Outline entry

...

Outline entry

Structure tree

Structure element

...

Structure element

Metadata reference

Names dictionary

Embedded files

JavaScripts

Interactive form

Collections

Document parts

Information and controls



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