INTERNATIONAL STANDARD

ISO 14289-1

Second edition
2014-12-15

Document management applications — Electronic document file format enhancement for accessibility —

Part 1: Use of ISO 32000-1 (PDF/UA-1)

Applications de la gestion de documents — Amélioration de format du fichier du document électronique pour l'accessibilité —

Partie 1: Utilisation de l'ISO 32000-1 (PDF/UA-1)

Reference number
ISO 14289-1:2014(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 171, *Document management applications*, Subcommittee SC 2, *Application issues*.

This second edition of ISO 14289-1 cancels and replaces the first edition (ISO 14289-1:2012, Corrected version), of which it constitutes a minor revision incorporating the following corrections:

— in Scope, line 1, rewording clarifies the reference to ISO 32000-1:2008 that was changed in the ISO publishing process;

— in Clause 5, the method for specifying version and conformance has been clarified;

— in 7.3 (line after second bullet), bold type has been applied to the word "Caption";

— in 7.3 (line before Note 1), "Table 333 has been replaced by "Table 323" and a reference to subclause 14.7.2 has been added;

— in 7.4.1 (second line), a reference to subclause 14.7.2 has been added;

— in 7.4.3 (first paragraph), the phrase "listed above" in the second sentence has been replaced with the correct reference in this International Standard;

— in 7.4.4 (first line), bold type has been applied to the letter "H";

— in 7.5 (second paragraph), the normative requirement to have a Scope attribute on a TH structure element has been changed from a shall to a should, and additional normative text added to explicate when the Scope element is required;

— in 7.6 (second bullet), LI has been replaced by L;

— in 7.17 (last paragraph), a reference to 7.7.2 has been added;

— in 7.18.1 (first paragraph), elements of Subtype Popup have been exempted from the requirements in this clause;

— in 7.18.1 (fourth paragraph), alternative descriptions for widget annotations have been clarified;

— in 7.18.2 (first line), 7.17.1 has been replaced by 7.18.1;

— in 7.18.5 (first paragraph), the reference has been corrected to ISO 32000-1:2008, 14.8.4.4.2;

— in 7.18.8, the requirements for handling of annotation type PrinterMark have been clarified;

— in 8.4 (third bullet), the word “the” has been added before “value”;

— in 8.8 (Note), a reference to 12.2 has been added.

ISO 14289 consists of the following parts, under the general title *Document management applications — Electronic document file format enhancement for accessibility*:

— *Part 1: Use of* ISO 32000-1 *(PDF/UA-1)*

Introduction

PDF is a digital format for representing documents. PDF files may be created natively in PDF form, converted from other electronic formats, or digitized from paper. Businesses, governments, libraries, archives and other institutions and individuals around the world use PDF to represent considerable bodies of important information. These PDF files should be made accessible to users with disabilities.

The accessibility of a document is dependent on the inclusion of a variety of semantic information in a document such as (but not limited to) machine-recoverable text presented in a declared language, logical structure of content, and organization of that content in pages, sections and paragraphs. Semantic information can also contain a variety of descriptive metadata, such as alternative text for images. The primary purpose of ISO 14289 (known as PDF/UA) is to define how to represent electronic documents in the PDF format in a manner that allows the file to be accessible. This is accomplished by identifying the set of PDF components that may be used and restrictions on the form of their use. PDF/UA is intended as a companion standard, to be used in conjunction with ISO 32000, ISO 19005, ISO 15930 and other standards as may apply for the purpose of achieving accessibility or as mandated by this International Standard. In order for PDF/UA conforming files to be truly accessible, requirements on conforming readers and conforming assistive technology are also stipulated herein. By itself, PDF/UA does not necessarily ensure that the visual appearance of the content accurately reflects any original source material used to create the conforming file. For example, the process used to create a conforming file might substitute fonts, reflow text, downsample images, or use lossy compression. Organizations that need to ensure that a conforming file is an accurate representation of original source material may need to impose additional requirements on the processes that generate the conforming file beyond those imposed by this International Standard. In addition, it is important for those organizations to implement policies and practices regarding the inspection of conforming files for correct placement of accessibility information.

AIIM (an accredited standards developing organization) maintains an ongoing series of application notes for guiding developers and users of this International Standard. These application notes will be displayed, when available, at http://www.aiim.org/pdfua/app-notes. AIIM will also retain copies of the specific non-ISO normative references in this International Standard that are publicly available electronic documents.

Document management applications — Electronic document file format enhancement for accessibility —

Part 1: Use of ISO 32000-1 (PDF/UA-1)

1 Scope

This part of ISO 14289 specifies the use of ISO 32000-1:2008 to produce accessible electronic documents.

This part of ISO 14289 is not applicable to:

— specific processes for converting paper or electronic documents to the PDF/UA format;

— specific technical design, user interface, implementation, or operational details of rendering;

— specific physical methods of storing these documents, such as media and storage conditions;

— required computer hardware and/or operating systems.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 32000-1:2008, *Document management — Portable document format — Part 1: PDF 1.7*

Web Content Accessibility Guidelines 2.0, W3C Recommendation, 11 December 2008. Available from the Internet <http://www.w3.org/TR/WCAG20>.

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1
assistive technology
AT
software and/or hardware used by a person with a disability that provides alternative controls and/or renditions to facilitate their access to and usage of available functionality and information

3.2
alternate description
description of a structure element and its children

[SOURCE: ISO 32000-1:2008, 14.9.3]

Note 1 to entry: ISO 32000-1 uses both “alternate text” and “alternate description” to refer to the same item.

3.3
dictionary
associative table containing key-value pairs, specifying the name and value of an attribute for objects, which is generally used to collect and tie together the attributes of a complex object

[SOURCE: ISO 32000-1:2008, 4.17]

3.4
interactive reader
reader that requires or allows human interaction with the content and other objects contained in the document during the software's processing phase

Note 1 to entry: A file viewing tool is an example of an interactive reader; a raster image processor is an example of a reader that is not interactive.

3.5
Portable Document Format
PDF
file format defined in ISO 32000-1:2008

3.6
reader
software application that is able to read and process PDF files appropriately

[SOURCE: ISO 32000-1:2008, 2.2]

3.7
replacement text
text that is an exact replacement for the structure element and its children in cases where an AT device needs to read the element inline with the surrounding content

[SOURCE: ISO 32000-1:2008, 14.9.4]

3.8
writer
software application that is able to write PDF files

[SOURCE: ISO 32000-1:2008, 2.3]

4 Notation

PDF operators, PDF keywords, the names of keys in PDF dictionaries, and other predefined names are written in bold font; operands of PDF operators or values of dictionary keys are written in italic font. Some names can also be used as values, depending on the context, and so the styling of the content will be context specific.

EXAMPLE 1 The *Default* value for the **TR2** key.

Token characters used to delimit objects and describe the structure of PDF files, as defined in ISO 32000-1:2008, 7.2.1, may be identified by their ISO/IEC 646 character name written in upper case in bold font followed by a parenthetic two digit hexadecimal character value with the suffix "h".

EXAMPLE 2 **CARRIAGE RETURN** (0Dh).

Text string characters, as defined in ISO 32000-1:2008, 7.9.2, may be identified by their ISO/IEC 10646 character name written in uppercase in bold font followed by a parenthetic four digit hexadecimal character code value with the prefix "U+".

EXAMPLE 3 **EN SPACE** (U+2002).

5 Version identification

The PDF/UA version and conformance of a file shall be specified in the metadata stream that is the value of the Metadata key in the Catalog using the PDF/UA Identification extension schema defined in Table 1.

The Identification schema namespace URI is http://www.aiim.org/pdfua/ns/id/. The required schema namespace prefix is **pdfuaid**.

Table 1 — PDF/UA Identification schema

Property	Value type	Category	Description
pdfuaid:part	*Open Choice of Integer*	Internal	Required PDF/UA version identifier
pdfuaid:amd	*Open Choice of Text*	Internal	Optional PDF/UA amendment identifier
pdfuaid:corr	*Open Choice of Text*	Internal	Optional PDF/UA corrigenda identifier

The value of **pdfuaid:part** shall be the part number of this International Standard to which the file conforms. If the file conforms to a version of this International Standard that is defined by an amendment to a part, then the value of **pdfuaid:amd** shall be the amendment number and year, separated by a colon.

The values of the **pdfuaid:part, pdfuaid:amd** and **pdfuaid:corr** properties do not by themselves determine conformance with any part of this International Standard.

6 Conformance requirements

6.1 General

ISO 14289 defines a file format for representing electronic documents known as “PDF/UA” and also defines how conforming readers and conforming assistive technology (AT) process such documents.

The version number of a file may be any value from 1.0 to 1.7, and the value shall not be used in determining whether a file is in conformance with this part of ISO 14289.

NOTE The proper mechanism by which a file can presumptively identify itself as being a PDF/UA file of a given conformance level is described in Clause 5.

6.2 Conforming files

Conforming files shall adhere to all requirements of ISO 32000-1:2008 as modified by this part of ISO 14289. A conforming file may include any valid ISO 32000-1:2008 feature that is not explicitly forbidden by this part of ISO 14289. Features described in PDF specifications prior to ISO 32000-1:2008 which are not explicitly defined in ISO 32000-1 should not be used.

NOTE A conforming file is not obligated to use any PDF feature other than those explicitly required by ISO 32000-1 or this part of ISO 14289.

A conforming file shall contain PDF/UA version identification as defined in Clause 5.

A conforming file shall adhere to all file format provisions in Clause 7.

6.3 Conforming reader

A conforming PDF/UA reader shall adhere to conforming reader provisions in ISO 32000-1:2008 as well as to all reader requirements of this part of ISO 14289.

NOTE A conforming reader can also be integrated with conforming assistive technology.

6.4 Conforming assistive technology

A conforming AT shall adhere to all provisions in Clause 9.

7 File format requirements

7.1 General

All real content shall be tagged as defined in ISO 32000-1:2008, 14.8. Artifacts (ISO 32000-1:2008, 14.8.2.2.2) shall not be tagged in the structure tree.

Content shall be marked in the structure tree with semantically appropriate tags in a logical reading order. Content that does not render and does not have a rendered equivalent shall be marked as an artifact.

NOTE 1 Because they are not considered real content, artifacts are not present in the structure tree according to ISO 32000-1:2008, 14.8.2.2. Real content consists of graphics objects in page content with semantic significance. Artifacts are graphics objects outside of the real content.

NOTE 2 This content also applies whether or not the content is included in one or more optional content groups.

Non-standard structure types are permitted. However, they shall be mapped to the nearest functionally equivalent standard type, as defined in ISO 32000-1:2008, 14.8.4, in the role map dictionary of the structure tree root. This mapping may be indirect; within the role map a non-standard type can map directly to another non-standard type, but eventually the mapping shall terminate at a standard type.

NOTE 3 Non-standard structure types are types other than those defined in ISO 32000.

Standard tags defined in ISO 32000-1:2008, 14.8.4, shall not be remapped.

Flickering, blinking, or flashing shall not be used (WCAG 2.0, Guideline 2.3).

Information shall not be conveyed by contrast, colour, format or layout, or by combinations thereof, unless the content is tagged to reflect all intended meaning.

NOTE 4 WCAG 2.0, Guideline 1.4 explains issues regarding contrast, colour and other formatting for accessibility.

All information conveyed with sound should also be available without sound.

The **Metadata** stream in the document's catalog dictionary shall contain a dc:title entry, where dc is the recommended prefix for the Dublin Core metadata schema as defined in the XMP specification, which clearly identifies the document. A document information dictionary may be present in a conforming file and an ISO 14289-1 conforming reader shall ignore it.

The **ViewerPreferences** dictionary of the document's **Catalog** dictionary shall be present and shall contain at least the key **DisplayDocTitle** with a value of *true*, as described in ISO 32000-1:2008, 12.2, Table 150.

Documents consisting of raster-based images may be processed to generate machine-readable content. In such cases, errors resulting from the content-generation process shall be corrected and the content shall be tagged according to Clause 7.

NOTE 5 Methods used for correcting such errors are dependent on the tools used for processing documents consisting of raster-based images.

Files claiming conformance with this International Standard shall have a **Suspects** value of *false* (ISO 32000-1:2008, Table 321).

7.2 Text

Content shall be tagged in logical reading order. The most semantically appropriate tag shall be used for each logical element in the document content.

Character codes shall map to Unicode as described in ISO 32000-1:2008, 14.8.2.4.2. Characters not included in the Unicode specification may use the Unicode private use area or declare another character encoding.

Natural language shall be declared as discussed in ISO 32000-1:2008, 14.9.2 and/or as described in ISO 32000-1:2008, 7.9.2. Changes in natural language shall be declared. Changes in natural language inside text strings (e.g. inside alternate descriptions) shall be declared using a language identifier as described in ISO 32000-1:2008, 14.9.2.2.

Stretchable characters such as parentheses or brackets (often drawn by combining several individual glyphs to form the appearance of a single glyph) shall be tagged using **ActualText**, as specified in ISO 32000-1:2008, 14.9.4.

7.3 Graphics

Graphics objects, other than text objects, shall be tagged with a **Figure** tag as described in ISO 32000-1:2008, 14.8.4.5, Table 340. If any of the following exceptions are true, then the graphic shall be tagged as an artifact:

— the graphic does not represent meaningful content, or

— the graphic appears as a background to a link annotation, in which case, the alternative text on the link shall describe both the graphic and the link.

A caption accompanying a figure shall be tagged with a **Caption** tag.

Figure tags shall include an alternative representation or replacement text that represents the contents marked with the Figure tag as noted in ISO 32000-1:2008, 14.7.2, Table 323.

NOTE 1 See also WCAG 2.0, Guideline 1.1.

If text represented in a graphic is not text in a natural language that is meant to be read by a human reader, alternative text describing the nature or purpose of the graphic shall be provided.

NOTE 2 Text that is a type sample or a sample of the writing system used by a language are examples of text that is not in a natural language.

Graphics that possess semantic value only in combination with other graphics shall be tagged with a single **Figure** tag for each group.

When a more accessible representation exists, the more accessible representation should be used instead of a graphic.

NOTE 3 An example where more accessible representations exist is text.

7.4 Headings

7.4.1 General

A conforming document shall use heading tags for all headings as detailed in ISO 32000-1:2008, 14.8.4.3.2. The **T** key in ISO 32000-1:2008, 14.7.2, Table 323 should be used to denote document sections.

NOTE ‘Chapter 1’ or ‘Bibliography’ are examples of document section headings.

7.4.2 Numbered headings

For documents that are not strongly structured, as described in ISO 32000-1:2008, 14.8.4.3.5, heading tags shall be used as follows:

— If any heading tags are used, **H1** shall be the first.

— A document may use more than one instance of any specific tag level. For example, a tag level may be repeated if document content requires it.

NOTE 1 **H1 H2 H3 H3** is a valid sequence if the content has one top-level heading, one second-level heading, and two consecutive third-level headings.

— If document semantics require a descending sequence of headers, such a sequence shall proceed in strict numerical order and shall not skip an intervening heading level. **H1 H2 H3** is permissible, while **H1 H3** is not.

NOTE 2 Heading levels are said to descend if they use a sequence from **H1** to **H2**, **H2** to **H3**, **H3** to **H4**, **H4** to **H5**, and/or **H5** to **H6**.

— A document may increment its heading sequence without restarting at **H1** if document semantics require it.

NOTE 3 **H1 H2 H3 H4 H3 H4 H3 H4 H2 H3** is a permissible sequence.

7.4.3 Additional headings

If a PDF that contains the tags **H1**, **H2**, **H3**, **H4**, **H5**, and **H6** (in any permissible sequence) requires more headings, tags numbered from **H7** upward (without limit) may be defined and used. Tags **H7** to **H*n*** shall comply with all the usage requirements listed in 7.4.2 for **H1** to **H6**. These user-defined heading tags shall use the letter **H** followed by Arabic numerals without intervening whitespace, shall not use any other numbering system, and shall not use numerical separators.

NOTE 1 Roman numerals are an example of another numbering system that is not permissible in heading tags.

NOTE 2 **H1247** is permissible while **H1,247** and **H1 247** are not.

7.4.4 Unnumbered headings

The generic heading **H** (ISO 32000-1:2008, Tables 334 and 335) should be used in strongly structured documents (ISO 32000-1:2008, 14.8.4.3.5). Each node in the tag tree shall contain at most one child H tag.

Documents that are strongly structured may use numbered headings.

All documents shall be either strongly or weakly structured, but not both.

7.5 Tables

Tables should include headers. Table headers shall be tagged according to ISO 32000-1:2008, Table 337 and Table 349.

NOTE 1 Tables can contain column headers, row headers or both.

NOTE 2 As much information as possible about the structure of tables needs to be available when assistive technology is relied upon. Headers play a key role in providing structural information.

Structure elements of type TH should have a Scope attribute. If the table's structure is not determinable via Headers and IDs, then structure elements of type TH shall have a Scope attribute.

Table tagging structures shall only be used to tag content presented within logical row and/or column relationships.

7.6 Lists

Lists shall be tagged according to ISO 32000-1:2008, 14.8.4.3.3, Table 336 with the following additional provisions:

— Individual list items shall be specified by **LI** tags. **Lbl** and **LBody** tags may be included.

— An explicit **ListNumbering** attribute shall be used for **L** tags in ordered lists as specified in ISO 32000-1:2008, 14.8.5.5, Table 347.

Lists shall only be used when required when the content is intended to be read as a list.

7.7 Mathematical expressions

All mathematical expressions shall be enclosed within a **Formula** tag as detailed in ISO 32000-1:2008, 14.8.4.5 and shall have an **Alt** attribute.

The requirements regarding mapping of characters to Unicode shall apply to mathematical expressions as set forth in ISO 32000-1:2008, 9.10.2 and 14.8.2.4.

7.8 Page headers and footers

Running headers and footers shall be identified as **Pagination** artifacts and shall be classified as either **Header** or **Footer** subtypes as per ISO 32000-1:2008, 14.8.2.2.2, Table 330.

7.9 Notes and references

Footnotes, endnotes, note labels and references (cross-references or citations to locations within the document) shall be tagged per ISO 32000-1:2008, 14.8.4.4, Table 338.

Footnotes and endnotes shall be tagged with a **Note** tag. Each note tag shall have a unique entry in the **ID** key as described in ISO 32000-1:2008, 14.7.2, Table 323.

7.10 Optional content

All optional content configuration dictionaries in the document, including the default optional content configuration dictionary, shall contain a **Name** entry (ISO 32000-1:2008, 8.11.2.1, Table 98) whose value is a non-empty text string when both of the following conditions are true: a document contains a **Configs** entry in the **OCProperties** entry of the Catalog dictionary (ISO 32000-1:2008, 7.7.2, Table 28), and the **Configs** entry contains at least one optional content configuration dictionary.

The **AS** key shall not appear in any optional content configuration dictionary.

NOTE 1 This prevents the automatic adjustment of states based on usage information (ISO 32000-1:2008, 8.11.4.5).

NOTE 2 The requirements of 7.21 apply for all fonts used in all optional content, even where a particular exchange will not result in some optional content being rendered.

7.11 Embedded files

A conforming PDF/UA file may contain other types of files embedded inside it either as *EmbeddedFiles* or as File Attachment annotations. Any such file should be accessible in its own right, as defined by applicable accessibility standards (if any) for its type. The file specification dictionary for an embedded file shall contain the **F** and **UF** keys and should contain the **Desc** key (ISO 32000-1:2008, 7.11.3, Table 44.).

7.12 Article threads

Article threads (ISO 32000-1:2008, 12.4.3) shall reflect the logical reading order as defined by the document structure.

7.13 Digital signatures

The appearance of a signature form field as documented in ISO 32000-1:2008, 12.7.4.5 shall meet all other requirements for page content of this specification.

If a portion of the appearance of a signature is represented by a graphic, alternative text shall be provided for that graphic.

7.14 Non-interactive forms

Non-interactive forms shall be tagged using the PrintField attributes, as defined in ISO 32000-1:2008, 14.8.5.6.

7.15 XFA

If the **AcroForm** dictionary (ISO 32000-1:2008, 12.7.2) of the document catalog dictionary contains an **XFA** key, whose value is either an array or a stream, then the PDF shall be considered as an XFA-based form.

Static XFA forms may be used in files conforming to this International Standard.

Dynamic XFA forms shall not be used in files conforming to this International Standard. To determine whether a form is dynamic XFA or not, a conforming reader shall locate the **dynamicRender** element and compare its value to "required"; if they are equal, then the form shall be considered dynamic.

NOTE The **dynamicRender** element is a child of the **acrobat7** element which is a child of the **acrobat** element which is a child of the **config** element which is a child of the root **xdp** element.

7.16 Security

An encrypted conforming file shall contain a **P** key in its encryption dictionary (ISO 32000-1:2008, 7.6.3.2, Table 21). The 10th bit position of the **P** key shall be true.

NOTE 1 Having this bit set enables support for assistive technology devices.

NOTE 2 It is advised not to encrypt documents in such a way as to prohibit assistive technology from accessing document content or to prohibit users from converting documents to alternative accessible formats.

7.17 Navigation

A document should include a document outline that matches the reading order and level of navigational targets (ISO 32000-1:2008, 12.3.3).

NOTE A document outline contains outline items that are often referred to as bookmarks. Outline items can refer to destinations or invoke actions.

If present, the entries in the **PageLabels** number tree (ISO 32000-1:2008, 7.7.2, Table 28) should be semantically appropriate.

7.18 Annotations

7.18.1 General

The requirements of this clause shall not apply to annotations whose **hidden** flag is set or whose rectangle is outside the **CropBox** or whose Subtype is **Popup**.

Annotations shall be represented in the structure tree in correct reading order according to the Annotation Elements section of ISO 32000-1:2008, 14.8.4.4.3.

If used for purposes such as visual formatting, annotations shall be tagged according to their semantic function. Such annotations shall be tagged with their respective structure tag types.

NOTE An example of an annotation used for visual formatting is a form field used to mask other objects.

Any annotation that does not have a **Contents** key in its dictionary shall have an alternative description as required in ISO 32000-1:2008, 14.9.3.

7.18.2 Annotation types

Annotations whose subtypes are not defined in ISO 32000-1:2008 shall meet the requirements of 7.18.1.

Annotations of subtype **TrapNet** shall not be permitted.

7.18.3 Tab order

Tab order shall be defined by the structure tree. Every page on which there is an annotation shall contain in its page dictionary the key **Tabs** as defined in ISO 32000-1:2008, 7.7.3.3, Table 30, and its value shall be *S*.

7.18.4 Forms

A Widget annotation shall be nested within a **Form** tag per ISO 32000-1:2008, 14.8.4.5, Table 340.

NOTE Widget annotations are used for interactive forms.

7.18.5 Links

Links shall be tagged according to ISO 32000-1:2008, 14.8.4.4.2, Link Element.

Links shall contain an alternate description via their **Contents** key as described in ISO 32000-1:2008, 14.9.3.

The **IsMap** key shall not be present with a value of true in the URI action dictionary (ISO 32000-1:2008, 12.6.4.7) unless its functionality is also provided in an equivalent manner elsewhere in the content without using an **IsMap** key.

NOTE There is more than one technical way to implement equivalent functionality, for example, by using several individual Link annotations or a combination of widget annotations and JavaScript.

7.18.6 Media

7.18.6.1 General

This subclause describes the use of the set of annotations that contain the various types of multimedia that can be present in a PDF.

7.18.6.2 Media clip data

In the media clip data dictionary, the optional **CT** and **Alt** keys (ISO 32000-1:2008, 13.2.4.2, Table 274) are required.

7.18.7 File Attachments

File attachment annotations (ISO 32000-1:2008, 12.5.6.15) shall conform to all requirements in 7.11.

7.18.8 PrinterMark

PrinterMark annotations, if present, shall be considered Incidental Artifacts, as if they are hidden page elements as defined in ISO 32000-1:2008, 14.8.2.2.3.

Conforming writers that incorporate “PrinterMark” information as standard PDF content shall mark such content as an Artifact.

7.19 Actions

Conforming PDF files may include actions, as documented in ISO 32000-1:2008, 12.6.

If a script causes visible or focus changes to a document, the script should announce the change in a fashion that is available to assistive technology.

A script shall not require specific timings for individual keystrokes.

7.20 XObjects

Reference XObjects, as noted in ISO 32000-1:2008, 8.10.4, shall not be used in conforming PDF/UA files.

The content of Form XObjects shall be incorporated into structure elements according to ISO 32000-1:2008, 14.7.2.

7.21 Fonts

7.21.1 General

The intent of the requirements given in 7.21.2 to 7.21.8 is to ensure that the future rendering of the textual content of a conforming file matches, on a glyph-by-glyph basis, the static appearance of the file as originally created and, when possible, to allow the recovery of semantic properties for each character of the textual content. Unless a requirement specifically states that it shall only apply to text that would be rendered by a conforming reader, they shall apply to any font including those used exclusively with text rendering mode 3.

NOTE A font referenced solely in text rendering mode 3 (ISO 32000-1:2008, 9.3.6) is not rendered and is thus exempt from the requirements that impact the visual representation of the glyphs of a font.

7.21.2 Font types

All fonts and font programs used in a conforming file, regardless of rendering mode usage, shall conform to the provisions in ISO 32000-1:2008, 9.6 and 9.7 as well as to the font specifications referenced by these provisions.

NOTE It is the responsibility of the writer to ensure this conformance. This part of ISO 14289 does not prescribe the manner in which font conformance is determined.

Multiple master fonts shall be considered a special case of Type 1 fonts; any requirement stated with regard to Type 1 fonts shall also be required with regard to multiple master fonts.

7.21.3 Composite fonts

7.21.3.1 General

For any given composite (Type 0) font within a conforming file, the **CIDSystemInfo** entry in its CIDFont dictionary and its encoding dictionary shall have the following relationship:

— If the **Encoding** key in the Type 0 font dictionary is *Identity-H* or *Identity-V*, any values of **Registry**, **Ordering** and **Supplement** may be used in the **CIDSystemInfo** entry of the CIDFont.

— Otherwise, the corresponding **Registry** and **Ordering** strings in both CIDSystemInfo dictionaries shall be identical, and the value of the **Supplement** key in the CIDSystemInfo dictionary of the CIDFont shall be greater than or equal to the **Supplement** key in the CIDSystemInfo dictionary of the CMap.

NOTE The requirement for the **Supplement** key ensures that the font includes glyphs for all CIDs which can be referenced by the CMap.

7.21.3.2 CIDFonts

ISO 32000-1:2008, 9.7.4, Table 117 requires that all embedded Type 2 **CIDFonts** in the CIDFont dictionary shall contain a **CIDToGIDMap** entry that shall be a stream mapping from CIDs to glyph indices or the name *Identity*, as described in ISO 32000-1:2008, 9.7.4, Table 117.

7.21.3.3 CMaps

All CMaps used within a conforming file, except those listed in ISO 32000-1:2008, 9.7.5.2, Table 118, shall be embedded in that file as described in ISO 32000-1:2008, 9.7.5. For those CMaps that are embedded, the integer value of the **WMode** entry in the CMap dictionary shall be identical to the **WMode** value in the embedded CMap stream.

A **CMap** shall not reference any other **CMap** except those listed in ISO 32000-1:2008, 9.7.5.2, Table 118.

7.21.4 Embedding

7.21.4.1 General

The font programs for all fonts used for rendering within a conforming file shall be embedded within that file, as defined in ISO 32000-1:2008, 9.9. A font is considered to be used if at least one of its glyphs is referenced from a content stream (ISO 32000-1:2008, 7.8.2).

NOTE 1 Embedding the font programs allows any conforming reader to reproduce correctly all glyphs in the manner in which they were originally published without reference to external resources.

NOTE 2 As discussed in ISO 32000-1:2008, 9.3.6, text rendering mode 3 specifies that glyphs are not stroked, filled or used as a clipping boundary. A font referenced for use solely in this mode is therefore not rendered and is thus exempt from the embedding requirement.

Only font programs that are legally embeddable in a file for unlimited, universal rendering shall be used.

NOTE 3 This part of ISO 14289 precludes the embedding of font programs whose legality depends upon special agreement with the copyright holder. Such an allowance places unacceptable burdens to verify the existence, validity and longevity of such claims.

Embedded fonts shall define all glyphs referenced for rendering within the conforming file.

NOTE 4 As stated in 7.21.4.2, subsets of a font are acceptable as long as the embedded font provides glyph definitions for all characters referenced within the file.

All conforming readers shall use the embedded fonts, rather than other locally resident, substituted or simulated fonts, for rendering.

NOTE 5 There is no exemption from the requirements of 7.21.4 for the 14 standard Type 1 fonts.

7.21.4.2 Subset embedding

ISO 32000-1:2008, 9.6 permits the embedding of subsets of font programs.

NOTE 1 The use of subsets of a font and its associated font program allows a potentially substantial reduction in the size of conforming files.

If the **FontDescriptor** dictionary of an embedded Type 1 font contains a **CharSet** string, then it shall list the character names of all glyphs present in the font program, regardless of whether a glyph in the font is referenced or used by the PDF or not.

NOTE 2 The above requirement makes normative the statements in ISO 32000-1:2008, 9.8.

If the **FontDescriptor** dictionary of an embedded CID font contains a **CIDSet** stream, then it shall identify all CIDs which are present in the font program, regardless of whether a CID in the font is referenced or used by the PDF or not.

NOTE 3 The above requirement makes normative the statements in ISO 32000-1:2008, 9.8.3.1, Table 124.

7.21.5 Font metrics

For every font embedded in a conforming file and used for rendering, the glyph width information in the font dictionary and in the embedded font program shall be consistent. For ISO 14289, “consistent” is defined to be a difference of no more than 1/1000 unit.

NOTE This requirement is necessary to ensure predictable font rendering, regardless of whether a given reader uses the metrics in the font dictionary or those in the font program.

7.21.6 Character encodings

For all non-symbolic TrueType fonts used for rendering, the embedded TrueType font program shall contain one or several non-symbolic **cmap** entries such that all necessary glyph lookups can be carried out.

All non-symbolic TrueType fonts shall have either *MacRomanEncoding* or *WinAnsiEncoding* as the value for the **Encoding** key in the Font dictionary or as the value for the **BaseEncoding** key in the dictionary which is the value of the **Encoding** key in the Font dictionary.

In addition, non-symbolic TrueType fonts shall not define a **Differences** array unless all of the glyph names in the **Differences** array are listed in the Adobe Glyph List and the embedded font program contains at least the Microsoft Unicode (3,1 – Platform ID = 3, Encoding ID = 1) encoding in the “cmap” table.

Symbolic TrueType fonts shall not contain an **Encoding** entry in the font dictionary, and the “cmap” table in the embedded font program shall either contain exactly one encoding or it shall contain, at least, the Microsoft Symbol (3,0 – Platform ID = 3, Encoding ID = 0) encoding.

In all cases for TrueType fonts that are to be rendered, character codes shall be able to be mapped to glyphs according to ISO 32000-1, 9.6.6.4 without the use of a non-standard mapping chosen by the conforming reader.

7.21.7 Unicode character maps

The font dictionary of all fonts, regardless of their rendering mode usage, shall include a **ToUnicode** entry whose value is a CMap stream object that maps character codes for at least all referenced glyphs

to Unicode values, as described in ISO 32000-1:2008, 9.10.3, unless the font meets at least one of the following four conditions:

— fonts that use the predefined encodings **MacRomanEncoding**, **MacExpertEncoding** or **WinAnsiEncoding**;

— Type 1 and Type 3 fonts where the glyph names of the glyphs referenced are all contained in the Adobe Glyph List or the set of named characters in the Symbol font, as defined in ISO 32000-1:2008, Annex D;

— Type 0 fonts whose descendant **CIDFont** uses the **Adobe-GB1**, **Adobe-CNS1**, **Adobe-Japan1** or **Adobe-Korea1** character collections;

— non-symbolic TrueType fonts.

NOTE 1 Unicode mapping allows the retrieval of semantic properties about every character referenced in the file.

The Unicode values specified in the **ToUnicode** CMap shall all be greater than zero (0), but not equal to either U+FEFF or U+FFFE.

NOTE 2 This requirement ensures that the values in the ToUnicode CMap will be useful values and not simply placeholders.

7.21.8 Use of .notdef glyph

A conforming document shall not contain a reference to the **.notdef** glyph from any of the text showing operators, regardless of text rendering mode, in any content stream.

NOTE Since the **.notdef** glyph does not have any semantic value, this requirement is present to avoid any ambiguity which might result from its use.

8 Conforming reader requirements

8.1 General

A conforming reader shall have the ability to process all structure types and artifacts defined in ISO 32000-1:2008.

In order to interface with a conforming AT device, a conforming interactive reader:

— shall have the ability to provide access to or present all structure tag types, attributes and key values (when appropriate) in this International Standard and shall respect the visibility state of Optional Content Groups when so doing;

— shall make artifacts available to assistive technology;

— shall make its user interface, if any, available to assistive technology;

— shall not interfere with any assistive technology feature.

NOTE 1 If a reader displays a tooltip for a form field, it may interfere with a screen magnifier.

NOTE 2 This part of ISO 14289 does not delineate any specific technical design for conforming readers or any user interface for conforming interactive readers.

8.2 Text

A conforming reader shall make logical reading order, as defined in the document according to 7.1 of this International Standard, available to AT devices.

A conforming reader shall have the ability to process character codes according to 7.2.

Natural language and changes to natural languages shall be made available by a conforming interactive reader to AT devices.

8.3 Tables

If a table cell is empty, a conforming interactive reader shall make that information available to conforming AT devices.

NOTE A table cell is considered "empty" if there is no data logically assignable to that cell.

8.4 Optional content

When a conforming document contains optional content, more than one representation may be selected if at least one of the following conditions is true:

— more than one optional content configuration dictionary is present;

— the **Order** entry is present in the optional content configuration dictionary, and the value of the **Order** entry contains at least one reference to an optional content group;

— the **Order** entry is present in at least one optional content configuration dictionary in the value of the **Configs** entry in the **OCProperties** entry in the document's **Catalog** dictionary, and the value of the **Order** entry contains at least one reference to an optional content group.

In the absence of explicit instructions to the contrary, a conforming reader shall render the file in the default state set by the value of the **D** key in the **OCProperties** dictionary, as specified in "Determining the State of Optional Content Groups" (ISO 32000-1:2008, 8.11.4).

A conforming interactive reader shall provide a means to display the contents of the **Order** key from any optional content configuration dictionaries present in the conforming file that contain an **Order** key or that inherit the **Order** key from the default optional content configuration dictionary. In addition, if a conforming file contains optional content configuration dictionaries in addition to the default optional content configuration dictionary, then a conforming interactive reader shall provide a means to display the list of optional content configuration dictionaries from which a user can choose which one to view and print.

NOTE 1 The optional content groups in an Order array can be structured using a hierarchy of arrays and not simply a flat list.

NOTE 2 An example of multiple representations would be alternative language content.

8.5 File attachments and embedded files

A conforming reader shall make available file attachments which are not otherwise present in the structure tree.

NOTE In the structure tree, annotations of subtype FileAttachment are used.

A conforming reader shall provide a mechanism to display the name strings from the value of the **EmbeddedFiles** key in the names dictionary of a conforming file. In addition, a conforming reader may also choose to display information from the associated embedded file stream dictionaries or their **Params** dictionary.

8.6 Digital signatures

A conforming reader shall inform the user that the document has been digitally signed and shall be able to present certificate attributes and validity status of digital signatures.

8.7 Actions

If an action causes visible or focus changes to a document, the conforming interactive reader should announce the change in a fashion that is available to assistive technology.

8.8 Metadata

A conforming interactive reader shall make available to conforming AT all elements in the **Metadata** stream of a document's **Catalog** dictionary.

NOTE This makes normative the recommendation for DisplayDocTitle in ISO 32000-1:2008, 12.2, Table 150.

8.9 Navigation

A conforming interactive reader:

— shall have the ability to navigate using the **PageLabels** number tree;

— shall have the ability to navigate using the structure hierarchy as defined in ISO 32000-1:2008, 14.7.2;

— shall have the ability to navigate using the document outline as per ISO 32000-1:2008, 12.3.3;

— shall permit destination values to be overridden by the user (ISO 32000-1:2008, 12.3.2);

— should map the target of navigation (when it is contained within the document) or a change of focus to the semantically appropriate tag.

8.10 Annotations

8.10.1 General

A conforming interactive reader shall make available to a conforming AT device the alternate description (ISO 32000-1:2008, 14.9.3) of each annotation.

8.10.2 Forms

A conforming interactive reader:

— shall make available to AT devices text descriptions for widget annotations as required in 7.18;

— shall follow the structure tree to determine the order in which form fields receive focus;

NOTE The *S* value of the **Tabs** key as required in 7.18 is used to follow the structure tree order.

— shall allow conforming AT to query the value, state, role, type, flags, and attributes of widget annotations;

— shall represent any semantic markup present in rich-text content of annotations (including those of subtype **Widget**) as noted in ISO 32000-1:2008, 12.7.3.4.

8.10.3 Media

A conforming reader shall not automatically play a media object, but shall instead play only upon user request.

A conforming reader that is able to play media natively shall make any playback controls provided available as per ISO 32000-1:2008, 13.2.5.

If a conforming interactive reader utilizes an external player, it shall not disrupt or disable any accessibility elements provided by that player.

9 AT requirements

9.1 General

A conforming AT device shall have the ability to consume and present to the user, in the user's preferred manner, all structure types, attributes and key values in this specification and shall have the ability to process artifacts that are not contained in the logical structure tree.

9.2 Optional content

When presented with multiple representations by a conforming reader, a conforming AT shall allow the user to access the representation of their choice.

9.3 Navigation

A conforming AT:

— should have the ability to navigate using the **PageLabels** number tree;

— shall have the ability to navigate using the structure hierarchy as defined in ISO 32000-1:2008, 14.7.2;

— should have the ability to navigate using the document outline as per ISO 32000-1:2008, 12.3.3;

— should permit navigation zoom values to be overridden by the user.

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