



# Matterhorn Protocol 1.1

## PDF/UA Conformance Testing Model

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## Introduction

Templates and document production processes can automate many aspects of accessibility, but the range of necessary checkpoints is extensive and human judgment is required in many areas.

Organizations committed to providing accessible electronic documents require a cost-effective means of ensuring their document's accessibility features are adequate.

Intended for software developers and document testers, the Matterhorn Protocol is designed to foster PDF/UA adoption by specifying a common set of tests to facilitate the exchange of detailed information on PDF/UA conformance.

**NOTE:** The concepts of “partial conformance” and “severity of non-conformance” are intentionally not addressed in this document.

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## Document History

| Version     | Date       | Change   |
|-------------|------------|--|
| <b>1.0</b>  | 2013-08-07 | Initial release  |
| <b>1.0</b>  | 2013-10-10 | Editorial and typographical corrections.   |
| <b>1.01</b> | 2014-02-11 | Changed two “Machine” checks to “Human”, updated the description on page 2, formatting changes to improve maintenance, added headings and a Table of Contents to improve navigability.   |
| <b>1.02</b> | 2014-04-30 | Minor editorial and formatting corrections, moved 08-003 to 01-007.  |
| <b>1.1</b>  | 2020-11-10 | <ul style="list-style-type: none"> <li>■ Failure condition 13-008 added</li> <li>■ Clarification note added to failure condition 14-004</li> <li>■ Clarification note added to checkpoint 28</li> <li>■ Failure conditions 28-002, 28-004, 28-005 specified more precisely</li> <li>■ Clarification note added to failure condition 31-010</li> <li>■ Other minor changes include notes for clarity, minor editorial corrections and PDF tagging using current best-practice.</li> </ul> |

## Background

PDF is the electronic document format found worldwide in every corner of almost every organization that uses computers. The value of PDF may be stated in terms of the capacity to deliver a *stable and trustworthy representation of a document*.

Accordingly, PDF implementers have a special responsibility to ensure reliability and consistency by following clear, specific and detailed industry and normative standards in the development of PDF creation, modification and viewing software.

## About PDF/UA

Ensuring content is accessible to users with disabilities presents broad and complex challenges in any technology. ISO 14289-1 (PDF/UA-1) specifies technical requirements for PDF files to ensure a high-quality and consistent reading experience when used by a variety of PDF/UA-conforming processors.

## Matterhorn Protocol Checkpoints

The Matterhorn Protocol is a set of 31 checkpoints comprised of 136 failure conditions encompassing file format requirements specified in PDF/UA-1. 87 failure conditions can be determined by software alone, 47 failure conditions usually require human judgment. 2 failure conditions have no specific tests (23-001 and 27-001). Some failure conditions pertain to the document, some to the page and most to individual objects such as tags, tables or annotations.

### Key to the Headers in the Failure Conditions Tables

|                          |  |
|--------------------------|--|
| <b>Index</b>             | A numerical identifier for individual failure conditions within a given Checkpoint.  |
| <b>Failure Condition</b> | Non-conforming condition present in the PDF file.<br><br>NOTE: Pathological software behavior (such as “flickering” by using a script to cause animation effects via a series of actions) is not addressed.  |
| <b>Section</b>           | A reference to the relevant section in PDF/UA on a paragraph level. “UA1” refers to the PDF/UA-1 standard. The point-separated numbers after the colon refer to a clause in PDF/UA-1. The digits following the hyphen identify a specific paragraph within the clause.                                       |
| <b>Type</b>              | The nature of the tested item. Possible values are <i>Doc</i> for aspects of the document as a whole, <i>Page</i> for pages inside the document, <i>Object</i> for individual data objects, <i>JS</i> for JavaScript embedded in the document and <i>All</i> where all aspects of the document are affected. |
| <b>How</b>               | While <i>not determinative</i> the value of “How” generally indicates the realistic best-practice approach at the present time. Some checkpoints may <i>always</i> be decided by <i>M (Machine)</i> , some <i>usually or probably</i> require <i>H (Human)</i> interaction.                                  |
| <b>See</b>               | Certain failure conditions are covered in full by other failure conditions. Such cases are indicated by an index reference in this column.   |

### Additional Reading

- Tagged PDF Best Practice Guide: Syntax, <https://www.pdfa.org/resource/tagged-pdf-best-practice-guide-syntax/>
- PDF/UA Reference Suite, <https://www.pdfa.org/resource/pdfua-reference-suite/>
- PDF/UA in a Nutshell, <https://www.pdfa.org/resource/pdfua-in-a-nutshell/>

### Other reading (superseded documents)

- PDF/UA-1 Technical Implementation Guide: Understanding ISO 14289-1 (PDF/UA-1), [https://www.aiim.org/Global/AIIM\\_Widgets/Community\\_Widgets/Technical-Implementation-Guide-32000-1](https://www.aiim.org/Global/AIIM_Widgets/Community_Widgets/Technical-Implementation-Guide-32000-1)
- Achieving WCAG 2.0 with PDF/UA, [https://www.aiim.org/Global/AIIM\\_Widgets/Community\\_Widgets/Achieving\\_WCAG](https://www.aiim.org/Global/AIIM_Widgets/Community_Widgets/Achieving_WCAG)

## PDF/UA-1 Failure Conditions

### Checkpoint 01: Real content tagged

| Index  | Failure Condition  | Section    | Type   | How | See |
|--------|--|------------|--------|-----|-----|
| 01-001 | Artifact is tagged as real content.  | UA1:7.1-1  | Object | H   | –   |
| 01-002 | Real content is marked as artifact.  | UA1:7.1-1  | Object | H   | –   |
| 01-003 | Content marked as Artifact is present inside tagged content.   | UA1:7.1-1  | Object | M   | –   |
| 01-004 | Tagged content is present inside content marked as Artifact.   | UA1:7.1-1  | Object | M   | –   |
| 01-005 | Content is neither marked as Artifact nor tagged as real content.  | UA1:7.1-2  | Object | M   | –   |
| 01-006 | <p>The structure type and attributes of a structure element are not <i>semantically</i> appropriate for the structure element. All of the following structure types must be taken into account:</p> <p>&lt;Document&gt;, &lt;Part&gt;, &lt;Art&gt;, &lt;Sect&gt;, &lt;Div&gt;, &lt;BlockQuote&gt;, &lt;Caption&gt;, &lt;TOC&gt;, &lt;TOCI&gt;, &lt;Index&gt;, &lt;NonStruct&gt;, &lt;Private&gt;, &lt;P&gt;, &lt;H&gt;, &lt;H1&gt;, &lt;H2&gt;, &lt;H3&gt;, &lt;H4&gt;, &lt;H5&gt;, &lt;H6&gt;, &lt;L&gt;, &lt;LI&gt;, &lt;Lbl&gt;, &lt;LBody&gt;, &lt;Table&gt;, &lt;TR&gt;, &lt;TH&gt;, &lt;TD&gt;, &lt;THead&gt;, &lt;TBody&gt;, &lt;TFoot&gt;, &lt;Span&gt;, &lt;Quote&gt;, &lt;Note&gt;, &lt;Reference&gt;, &lt;BibEntry&gt;, &lt;Code&gt;, &lt;Link&gt;, &lt;Annot&gt;, &lt;Ruby&gt;, &lt;Warichu&gt;, &lt;RB&gt;, &lt;RT&gt;, &lt;RP&gt;, &lt;WT&gt;, &lt;WP&gt;, &lt;Figure&gt;, &lt;Formula&gt;, &lt;Form&gt;.</p> <p>NOTE 1: Structure type is not semantically appropriate if the nature of the content inside the structure element does not match the structure type of the structure element.</p> <p>NOTE 2: For any non-standard structure types, the standard structure type to which the type is role-mapped shall be used for validation.</p> <p>NOTE 3: Tables are regular when the number of logical cells is equal in each row after accounting for <b>RowSpan</b> and <b>ColSpan</b> attributes.</p> <p>While PDF/UA-1 does not prohibit irregular tables, irregular tables are almost always a strong indicator of improper table structure. It may be a good idea to raise a warning when such tables are encountered, but it is not required by the Matterhorn Protocol.</p> <p>NOTE 4: The value of table cell attributes is a function of the cell's semantic role in the table's structure. Therefore, a &lt;TH&gt; cell may not include a <b>Scope</b> attribute with an inappropriate value.</p> | UA1:7.1-2  | Object | H   | –   |
| 01-007 | <b>Suspects</b> entry has a value of true.   | UA1:7.1-11 | Doc    | M   | –   |

## Checkpoint 02: Role Mapping

| Index  | Failure Condition  | Section   | Type | How | See |
|--------|--|-----------|------|-----|-----|
| 02-001 | One or more non-standard tag's mapping does not terminate with a standard type.<br><br>NOTE: Although PDF/UA defines the nomenclature for heading levels above <H6> (<Hn>), these are not standard structure types (as defined in ISO 32000-1) and therefore <Hn> tags must (PDF/UA-1 7.1, paragraph 1) be role-mapped to a standard structure type. According to PDF/UA-1, PDF/UA-conforming processors are expected to ignore such mappings and respect the heading level. | UA1:7.1-3 | Doc  | M   | –   |
| 02-002 | The mapping of one or more non-standard types is semantically inappropriate.   | UA1:7.1-3 | Doc  | H   | –   |
| 02-003 | A circular mapping exists  | UA1:7.1-3 | Doc  | M   | –   |
| 02-004 | One or more standard types are remapped.   | UA1:7.1-4 | Doc  | M   | –   |

NOTE: All Failure Conditions in Checkpoint 02 apply to entries in the role map dictionary regardless of whether a given tag is used in the structure tree or not.

## Checkpoint 03: Flickering

| Index  | Failure Condition  | Section   | Type   | How | See |
|--------|--|-----------|--------|-----|-----|
| 03-001 | One or more Actions lead to flickering.                    | UA1:7.1-5 | Page   | H   | –   |
| 03-002 | One or more multimedia objects contain flickering content. | UA1:7.1-5 | Object | H   | –   |
| 03-003 | One or more JavaScript actions lead to flickering.         | UA1:7.1-5 | JS     | H   | –   |

## Checkpoint 04: Color and Contrast

| Index  | Failure Condition   | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 04-001 | Information is conveyed by contrast, color, format or layout, or some combination thereof but the content is not tagged to reflect all meaning conveyed by the use of contrast, color, format or layout, or some combination thereof. | UA1:7.1-6 | Object | H   | –   |



## Checkpoint 05: Sound

| Index  | Failure Condition   | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 05-001 | Media annotation present, but audio content not available in another form.<br><br>NOTE 1: An example of another form is a transcript. | UA1:7.1-7 | Object | H   | –   |
| 05-002 | Audio annotation present, but content not available in another form.<br><br>NOTE 2: An example of another form is a transcript.       | UA1:7.1-7 | Object | H   | –   |
| 05-003 | JavaScript uses beep function but does not provide another means of notification.   | UA1:7.1-7 | JS     | H   | –   |

## Checkpoint 06: Metadata

| Index  | Failure Condition   | Section   | Type | How | See |
|--------|---|-----------|------|-----|-----|
| 06-001 | Document does not contain an XMP metadata stream  | UA1:7.1-8 | Doc  | M   | –   |
| 06-002 | The XMP metadata stream in the Catalog dictionary does not include the PDF/UA identifier. | UA1:5     | Doc  | M   | –   |
| 06-003 | XMP metadata stream does not contain <b>dc:title</b>                                      | UA1:7.1-8 | Doc  | M   | –   |
| 06-004 | <b>dc:title</b> does not clearly identify the document                                    | UA1:7.1-8 | Doc  | H   | –   |

## Checkpoint 07: Dictionary

| Index  | Failure Condition   | Section   | Type | How | See |
|--------|---|-----------|------|-----|-----|
| 07-001 | ViewerPreferences dictionary of the Catalog dictionary does not contain a <b>DisplayDocTitle</b> entry.               | UA1:7.1-9 | Doc  | M   | –   |
| 07-002 | ViewerPreferences dictionary of the Catalog dictionary contains a <b>DisplayDocTitle</b> entry with a value of false. | UA1:7.1-9 | Doc  | M   | –   |

## Checkpoint 08: OCR Validation

| Index  | Failure Condition                               | Section    | Type | How | See    |
|--------|---|------------|------|-----|--------|
| 08-001 | OCR-generated text contains significant errors. | UA1:7.1-10 | Page | H   | –      |
| 08-002 | OCR-generated text is not tagged                | UA1:7.1-10 | Page | H   | 01-006 |

## Checkpoint 09: Appropriate Tags

| Index  | Failure Condition  | Section   | Type   | How | See    |
|--------|--|-----------|--------|-----|--------|
| 09-001 | Tags are not in logical reading order.   | UA1:7.2-1 | Doc    | H   | –      |
| 09-002 | Structure elements are nested in a semantically inappropriate manner. (e.g., a table inside a heading).                          | UA1:7.2-1 | Object | H   | –      |
| 09-003 | The structure type (after applying any role-mapping as necessary) of a structure element is not <i>semantically</i> appropriate. | UA1:7.2-1 | Object | H   | 01-006 |
| 09-004 | A table-related structure element is used in a way that does not conform to the syntax defined in ISO 32000-1, Table 337.        | UA1:7.2-1 | Object | M   | –      |
| 09-005 | A list-related structure element is used in a way that does not conform to Table 336 in ISO 32000-1.                             | UA1:7.2-1 | Object | M   | –      |
| 09-006 | A TOC-related structure element is used in a way that does not conform to Table 333 in ISO 32000-1.                              | UA1:7.2-1 | Object | M   | –      |
| 09-007 | A Ruby-related structure element is used in a way that does not conform to Table 338 in ISO 32000-1.                             | UA1:7.2-1 | Object | M   | –      |
| 09-008 | A Warichu-related structure element is used in a way that does not conform to Table 338 in ISO 32000-1.                          | UA1:7.2-1 | Object | M   | –      |

## Checkpoint 10: Character Mappings

| Index  | Failure Condition                           | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 10-001 | Character code cannot be mapped to Unicode. | UA1:7.2-2 | Object | M   | –   |

NOTE: Unicode mapping requirements are specified in ISO 32000-1:2008, 14.8.2.4 “Extraction of character properties”.

## Checkpoint 11: Declared Natural Language

| Index  | Failure Condition   | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 11-001 | Natural language for text in page content cannot be determined.   | UA1:7.2-3 | Object | M   | –   |
| 11-002 | Natural language for text in <b>Alt</b> , <b>ActualText</b> and <b>E</b> attributes cannot be determined. | UA1:7.2-3 | Object | M   | –   |
| 11-003 | Natural language in the <b>Outline</b> entries cannot be determined.                                      | UA1:7.2-3 | Object | M   | –   |
| 11-004 | Natural language in the <b>Contents</b> entry for annotations cannot be determined.                       | UA1:7.2-3 | Object | M   | –   |
| 11-005 | Natural language in the <b>TU</b> entry for form fields cannot be determined.                             | UA1:7.2-3 | Object | M   | –   |
| 11-006 | Natural language for document metadata cannot be determined.  | UA1:7.2-3 | Doc    | M   | –   |
| 11-007 | Natural language is not appropriate.  | UA1:7.2-3 | All    | H   | –   |

## Checkpoint 12: Stretchable Characters

| Index  | Failure Condition                                       | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 12-001 | Stretched characters are not represented appropriately. | UA1:7.2-4 | Object | H   | –   |

## Checkpoint 13: Graphics

| Index  | Failure Condition   | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 13-001 | Graphics objects other than text objects and artifacts are not tagged with a <Figure> tag.                                | UA1:7.3-1 | Object | H   | –   |
| 13-002 | A link with a meaningful background does not include alternative text describing both the link and the graphic's purpose. | UA1:7.3-1 | Object | H   | –   |
| 13-003 | A caption is not tagged with a <Caption> tag.   | UA1:7.3-2 | Object | H   | –   |
| 13-004 | <Figure> tag alternative or replacement text missing.   | UA1:7.3-3 | Object | M   | –   |
| 13-005 | <b>ActualText</b> used for a <Figure> for which alternative text is more appropriate.                                     | UA1:7.3-4 | Object | H   | –   |
| 13-006 | Graphics objects that possess semantic value only within a group of graphics objects is tagged on its own.                | UA1:7.3-5 | Object | H   | –   |
| 13-007 | A more accessible representation is not used.   | UA1:7.3-6 | Object | H   | –   |
| 13-008 | <b>ActualText</b> not present when a <Figure> is intended to be consumed primarily as text.                               | UA1:7.3-4 | Object | H   | –   |

## Checkpoint 14: Headings

| Index  | Failure Condition   | Section     | Type   | How | See    |
|--------|---|-------------|--------|-----|--------|
| 14-001 | Headings are not tagged.  | UA1:7.4-1   | Doc    | H   | 01-006 |
| 14-002 | Does use numbered headings, but the first heading tag is not <H1>.  | UA1:7.4.2-1 | Doc    | M   | –      |
| 14-003 | Numbered heading levels in descending sequence are skipped (Example: <H3> follows directly after <H1>).   | UA1:7.4-1   | Doc    | M   | –      |
| 14-004 | <p>Numbered heading tags do not use Arabic numerals and are not role mapped to heading types that do use Arabic numerals.</p> <p>NOTE 1: A human is required to validate that the custom structure element is intended to be a heading element.</p> <p>Note 2: The rule requiring Arabic numerals for headings applies to the heading subtype for the structure element or, if role mapped, to its eventual heading target.</p> | UA1:7.4.3-1 | Object | H   | 01-006 |
| 14-005 | Content representing a 7 <sup>th</sup> level (or higher) heading does not use an <H7> (or higher) tag.  | UA1:7.4.3-1 | Object | H   | 01-006 |
| 14-006 | A node contains more than one <H> tag.  | UA1:7.4.4-1 | Object | M   | –      |
| 14-007 | <p>Document uses both &lt;H&gt; and &lt;H#&gt; tags.</p> <p>NOTE 3: In weakly-structured documents, headings always take the form &lt;Hn&gt; (e.g., &lt;H1&gt;, &lt;H2&gt;, &lt;Hn&gt;) without intervening whitespace or numerical separators.</p>   | UA1:7.4.4-3 | Doc    | M   | –      |

## Checkpoint 15: Tables

| Index  | Failure Condition   | Section   | Type   | How | See    |
|--------|---|-----------|--------|-----|--------|
| 15-001 | A row has a header cell, but that header cell is not tagged as a header.  | UA1:7.5-1 | Object | H   | –      |
| 15-002 | A column has a header cell, but that header cell is not tagged as a header.   | UA1:7.5-1 | Object | H   | –      |
| 15-003 | In a table not organized with <b>Headers</b> attributes and <b>IDs</b> , a <TH> cell does not contain a <b>Scope</b> attribute. | UA1:7.5-2 | Object | M   | –      |
| 15-004 | Content is tagged as a table for information that is not organized in rows and columns.   | UA1:7.5-3 | Object | H   | –      |
| 15-005 | A given cell's header cannot be unambiguously determined.   | UA1:7.5-2 | Object | H   | 01-006 |

## Checkpoint 16: Lists

| Index  | Failure Condition   | Section   | Type   | How | See    |
|--------|---|-----------|--------|-----|--------|
| 16-001 | List is an ordered list, but no value for the <b>ListNumbering</b> attribute is present.  | UA1:7.6-1 | Object | H   | –      |
| 16-002 | List is an ordered list, but the <b>ListNumbering</b> value is not one of the following: Decimal, UpperRoman, LowerRoman, UpperAlpha, LowerAlpha. | UA1:7.6-1 | Object | H   | –      |
| 16-003 | Content is a list but is not tagged as a list.  | UA1:7.6-2 | Object | H   | 01-006 |

## Checkpoint 17: Mathematical Expressions

| Index  | Failure Condition  | Section   | Type   | How | See    |
|--------|--|-----------|--------|-----|--------|
| 17-001 | Content is a mathematical expression but is not tagged with a <Formula> tag. | UA1:7.7-1 | Object | H   | 01-006 |
| 17-002 | <Formula> tag is missing an <b>Alt</b> attribute.                            | UA1:7.7-1 | Object | M   | –      |
| 17-003 | Unicode mapping requirements are not met.                                    | UA1:7.7-2 | Object | M   | 10-001 |

## Checkpoint 18: Page Headers and Footers

| Index  | Failure Condition   | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 18-001 | Headers and footers are not marked as pagination artifacts.                 | UA1:7.8-1 | Object | H   | –   |
| 18-002 | Header or footer artifacts are not classified as Header or Footer subtypes. | UA1:7.8-1 | Object | H   | –   |

## Checkpoint 19: Notes and References

| Index  | Failure Condition                                 | Section   | Type   | How | See |
|--------|---|-----------|--------|-----|-----|
| 19-001 | Footnotes or endnotes are not tagged as <Note>.   | UA1:7.9-1 | Object | H   | –   |
| 19-002 | References are not tagged as <Reference>.         | UA1:7.9-1 | Object | H   | –   |
| 19-003 | <b>ID</b> entry of the <Note> tag is not present. | UA1:7.9-2 | Object | M   | –   |
| 19-004 | <b>ID</b> entry of the <Note> tag is non-unique.  | UA1:7.9-2 | Object | M   | –   |

## Checkpoint 20: Optional Content

| Index  | Failure Condition   | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 20-001 | <b>Name</b> entry is missing or has an empty string as its value in an Optional Content Configuration Dictionary in the <b>Configs</b> entry in the <b>OCPProperties</b> entry in the Catalog dictionary.             | UA1:7.10-1 | Object | M   | –   |
| 20-002 | <b>Name</b> entry is missing or has an empty string as its value in an Optional Content Configuration Dictionary that is the value of the <b>D</b> entry in the <b>OCPProperties</b> entry in the Catalog dictionary. | UA1:7.10-1 | Object | M   | –   |
| 20-003 | An <b>AS</b> entry appears in an Optional Content Configuration Dictionary.   | UA1:7.10-2 | Object | M   | –   |

## Checkpoint 21: Embedded Files

| Index  | Failure Condition   | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 21-001 | The file specification dictionary for an embedded file does not contain <b>F</b> and <b>UF</b> entries. | UA1:7.11-1 | Object | M   | –   |

## Checkpoint 22: Article Threads

| Index  | Failure Condition                                     | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 22-001 | Article threads do not reflect logical reading order. | UA1:7.12-1 | Object | H   | –   |

## Checkpoint 23: Digital Signatures

| Index  | Failure Condition   | Section    | Type | How | See    |
|--------|---|------------|------|-----|--------|
| 23-001 | No test specific to digital signatures is required, however other provisions apply (form fields). | UA1:7.13-1 | --   | --  | 01-006 |

## Checkpoint 24: Non-Interactive Forms

| Index  | Failure Condition   | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 24-001 | Non-interactive forms are not tagged with the <b>PrintFields</b> attribute. | UA1:7.14-1 | Object | H   | -   |

## Checkpoint 25: XFA

| Index  | Failure Condition  | Section    | Type   | How | See |
|--------|--|------------|--------|-----|-----|
| 25-001 | File contains the dynamicRender element with value "required". | UA1:7.15-1 | Object | M   | -   |

## Checkpoint 26: Security

| Index  | Failure Condition   | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 26-001 | The file is encrypted but does not contain a <b>P</b> entry in its encryption dictionary.                                     | UA1:7.16-1 | Object | M   | -   |
| 26-002 | The file is encrypted and does contain a <b>P</b> entry but the 10 <sup>th</sup> bit position of the <b>P</b> entry is false. | UA1:7.16-1 | Object | M   | -   |

## Checkpoint 27: Navigation

| Index  | Failure Condition  | Section    | Type | How | See    |
|--------|--|------------|------|-----|--------|
| 27-001 | No tests specific to navigation are required; use appropriate semantics. | UA1:7.17-1 | --   | --  | 01-006 |

## Checkpoint 28: Annotations

Clause 7.18 in PDF/UA-1 (14289-1) is not applicable to annotations whose hidden flag is set or whose rectangle is outside the CropBox or whose Subtype is PopUp. In all these cases, the rules of checkpoint 28 do not apply.

| Index  | Failure Condition  | Section      | Type   | How | See                                     |
|--------|--|--------------|--------|-----|---|
| 28-001 | An annotation is not in correct reading order.   | UA1:7.18.1-2 | Object | H   | –                                       |
| 28-002 | An annotation, other than of subtype Widget, Link and PrinterMark, is not a direct child of an <Annot> structure element.  | UA1:7.18.1-2 | Object | M   | 28-010,<br>28-011,<br>28-017,<br>28-018 |
| 28-003 | An annotation is used for visual formatting but is not tagged according to its semantic function.  | UA1:7.18.1-3 | Object | H   | –                                       |
| 28-004 | An annotation, other than of subtype Widget, does not have a <b>Contents</b> entry and does not have an alternative description (in the form of an <b>Alt</b> entry in the enclosing structure element). | UA1:7.18.1-4 | Object | M   | –                                       |
| 28-005 | A form field does not have a <b>TU</b> entry and does not have an alternative description (in the form of an <b>Alt</b> entry in the enclosing structure element).                                       | UA1:7.18.1-4 | Object | M   | –                                       |
| 28-006 | An annotation with subtype undefined in ISO 32000 does not meet 7.18.1.  | UA1:7.18.2-1 | Object | M   | 28-001,<br>28-002,<br>28-003,<br>28-004 |
| 28-007 | An annotation of subtype TrapNet exists.   | UA1:7.18.2-2 | Object | M   | –                                       |
| 28-008 | A page containing an annotation does not contain a <b>Tabs</b> entry.  | UA1:7.18.3-1 | Object | M   | –                                       |
| 28-009 | A page containing an annotation has a <b>Tabs</b> entry with a value other than S.   | UA1:7.18.3-1 | Object | M   | –                                       |
| 28-010 | A widget annotation is not nested within a <Form> tag.   | UA1:7.18.4-1 | Object | M   | –                                       |
| 28-011 | A link annotation is not nested within a <Link> tag.   | UA1:7.18.5-1 | Object | M   | –                                       |
| 28-012 | A link annotation does not include an alternate description in its <b>Contents</b> entry.  | UA1:7.18.5-2 | Object | M   | –                                       |
| 28-013 | An <b>IsMap</b> entry is present with a value of true but the functionality is not provided in some other way.   | UA1:7.18.5-3 | Object | H   | –                                       |



| Index  | Failure Condition  | Section        | Type   | How | See               |
|--------|--|----------------|--------|-----|-------------------|
| 28-014 | CT entry is missing from the media clip data dictionary.                     | UA1:7.18.6.2-1 | Object | M   | –                 |
| 28-015 | Alt entry is missing from the media clip data dictionary.                    | UA1:7.18.6.2-1 | Object | M   | –                 |
| 28-016 | File attachment annotations do not conform to 7.11.                          | UA1:7.18.7-1   | Object | M   | 20-001            |
| 28-017 | A PrinterMark annotation is included in the logical structure.               | UA1:7.18.8-1   | Object | M   | –                 |
| 28-018 | The appearance stream of a PrinterMark annotation is not marked as Artifact. | UA1:7.18.8-2   | Object | M   | 01-002,<br>01-005 |

### Checkpoint 29: Actions

| Index  | Failure Condition  | Section    | Type   | How | See |
|--------|--|------------|--------|-----|-----|
| 29-001 | A script requires specific timing for individual keystrokes. | UA1:7.19-1 | Object | H   | –   |

### Checkpoint 30: XObjects

| Index  | Failure Condition   | Section    | Type   | How | See |
|--------|---|------------|--------|-----|-----|
| 30-001 | A reference XObject is present.                               | UA1:7.20-1 | Object | M   | –   |
| 30-002 | Form XObject contains MCIDs and is referenced more than once. | UA1:7.20-2 | Object | M   | –   |

### Checkpoint 31: Fonts

| Index  | Failure Condition   | Section        | Type   | How | See |
|--------|---|----------------|--------|-----|-----|
| 31-001 | A Type 0 font dictionary with encoding other than Identity-H and Identity-V has values for Registry in both <b>CIDSystemInfo</b> dictionaries that are not identical. | UA1:7.21.3-1   | Object | M   | –   |
| 31-002 | A Type 0 font dictionary with encoding other than Identity-H and Identity-V has values for Ordering in both <b>CIDSystemInfo</b> dictionaries that are not identical. | UA1:7.21.3.1-1 | Object | M   | –   |

| Index  | Failure Condition   | Section        | Type   | How | See |
|--------|---|----------------|--------|-----|-----|
| 31-003 | A Type 0 font dictionary with encoding other than Identity-H and Identity-V has a value for Supplement in the <b>CIDSystemInfo</b> dictionary of the CID font that is less than the value for Supplement in the <b>CIDSystemInfo</b> dictionary of the CMap.                        | UA1:7.21.3.1-1 | Object | M   | –   |
| 31-004 | A Type 2 CID font contains neither a stream nor the name <i>Identity</i> as the value of the <b>CIDToGIDMap</b> entry.  | UA1:7.21.3.2-1 | Object | M   | –   |
| 31-005 | A Type 2 CID font does not contain a <b>CIDToGIDMap</b> entry.  | UA1:7.21.3.2-1 | Object | M   | –   |
| 31-006 | A CMap is neither listed as described in ISO 32000-1:2008, 9.7.5.2, Table 118 nor is it embedded.   | UA1:7.21.3.3-1 | Object | M   | –   |
| 31-007 | The <b>WMode</b> entry in a CMap dictionary is not identical to the <b>WMode</b> value in the CMap stream.  | UA1:7.21.3.3-1 | Object | M   | –   |
| 31-008 | A CMap references another CMap which is not listed in ISO 32000-1:2008, 9.7.5.2, Table 118.<br><br>NOTE 1: For more information see ISO 32000-1 9.7.5.3, UseCMap entry.   | UA1:7.21.3.3-2 | Object | M   | –   |
| 31-009 | For a font used by text intended to be rendered the font program is not embedded.<br><br>NOTE 2: A glyph is used for rendering if the text render mode is not 3 (text render mode 3 is used for invisible text).  | UA1:7.21.4.1-1 | Object | M   | –   |
| 31-010 | A font program is embedded that is not legally embeddable for unlimited, universal rendering.<br><br>NOTE 3: Although machines may detect relevant flags, this may not correspond to actual legal circumstances.  | UA1:7.21.4.1-2 | Object | H   | –   |
| 31-011 | For a font used by text the font program is embedded but it does not contain glyphs for all of the glyphs referenced by the text used for rendering.<br><br>NOTE 4: A glyph is used for rendering if the text render mode is not 3 (text render mode 3 is used for invisible text). | UA1:7.21.4.1-3 | Object | M   | –   |

| Index  | Failure Condition   | Section        | Type   | How | See |
|--------|---|----------------|--------|-----|-----|
| 31-012 | The <b>FontDescriptor</b> dictionary of an embedded Type 1 font contains a <b>CharSet</b> string, but at least one of the glyphs present in the font program is not listed in the <b>CharSet</b> string.              | UA1:7.21.4.2-1 | Object | M   | –   |
| 31-013 | The <b>FontDescriptor</b> dictionary of an embedded Type 1 font contains a <b>CharSet</b> string, but at least one of the glyphs listed in the <b>CharSet</b> string is not present in the font program.              | UA1:7.21.4.2-2 | Object | M   | –   |
| 31-014 | The <b>FontDescriptor</b> dictionary of an embedded <b>CID</b> font contains a <b>CIDSet</b> string, but at least one of the glyphs present in the font program is not listed in the <b>CIDSet</b> string.            | UA1:7.21.4.2-3 | Object | M   | –   |
| 31-015 | The <b>FontDescriptor</b> dictionary of an embedded <b>CID</b> font contains a <b>CIDSet</b> string, but at least one of the glyphs listed in the <b>CIDSet</b> string is not present in the font program.            | UA1:7.21.4.2-4 | Object | M   | –   |
| 31-016 | For one or more glyphs, the glyph width information in the font dictionary and in the embedded font program differ by more than 1/1000 unit.  | UA1:7.21.5-1   | Object | M   | –   |
| 31-017 | A non-symbolic TrueType font is used for rendering, but none of the <b>cmap</b> entries in the embedded font program is a non-symbolic <b>cmap</b> .  | UA1:7.21.6-1   | Object | M   | –   |
| 31-018 | A non-symbolic TrueType font is used for rendering, but for at least one glyph to be rendered the glyph cannot be looked up by any of the non-symbolic <b>cmap</b> entries in the embedded font program.              | UA1:7.21.6-2   | Object | M   | –   |
| 31-019 | The font dictionary for a non-symbolic TrueType font does not contain an <b>Encoding</b> entry.   | UA1:7.21.6-3   | Object | M   | –   |
| 31-020 | The font dictionary for a non-symbolic TrueType font contains an <b>Encoding</b> dictionary which does not contain a <b>BaseEncoding</b> entry.   | UA1:7.21.6-4   | Object | M   | –   |
| 31-021 | The value for either the <b>Encoding</b> entry or the <b>BaseEncoding</b> entry in the Encoding dictionary in a non-symbolic TrueType font dictionary is neither <i>MacRomanEncoding</i> nor <i>WinAnsiEncoding</i> . | UA1:7.21.6-5   | Object | M   | –   |

| Index  | Failure Condition  | Section       | Type   | How | See |
|--------|--|---------------|--------|-----|-----|
| 31-022 | The <b>Differences</b> array in the <b>Encoding</b> entry in a non-symbolic TrueType font dictionary contains one or more glyph names which are not listed in the Adobe Glyph List.  | UA1:7.21.6-6  | Object | M   | –   |
| 31-023 | The <b>Differences</b> array is present in the <b>Encoding</b> entry in a non-symbolic TrueType font dictionary but the embedded font program does not contain a (3,1) Microsoft Unicode <b>cmap</b> .   | UA1:7.21.6-7  | Object | M   | –   |
| 31-024 | The <b>Encoding</b> entry is present in the font dictionary for a symbolic TrueType font.  | UA1:7.21.6-8  | Object | M   | –   |
| 31-025 | The embedded font program for a symbolic TrueType font contains no <b>cmap</b> .   | UA1:7.21.6-9  | Object | M   | –   |
| 31-026 | The embedded font program for a symbolic TrueType font contains more than one <b>cmap</b> , but none of the <b>cmap</b> entries is a (3,0) Microsoft Symbol <b>cmap</b> .  | UA1:7.21.6-10 | Object | M   | –   |
| 31-027 | A font dictionary does not contain the <b>ToUnicode</b> entry and none of the following is true: <ul style="list-style-type: none"> <li>■ the font uses <b>MacRomanEncoding</b>, <b>MacExpertEncoding</b> or <b>WinAnsiEncoding</b></li> <li>■ the font is a Type 1 or Type 3 font and 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</li> <li>■ the font is a Type 0 font, and its descendant <b>CIDFont</b> uses <b>Adobe-GB1</b>, <b>Adobe-CNS1</b>, <b>Adobe-Japan1</b> or <b>Adobe-Korea1</b> character collections</li> <li>■ the font is a non-symbolic TrueType font</li> </ul> | UA1:7.21.7-1  | Object | M   | –   |
| 31-028 | One or more Unicode values specified in the <b>ToUnicode CMap</b> are zero (0).  | UA1:7.21.7-2  | Object | M   | –   |
| 31-029 | One or more Unicode values specified in the <b>ToUnicode CMap</b> are equal to either U+FEFF or U+FFFE.  | UA1:7.21.7-3  | Object | M   | –   |
| 31-030 | One or more characters used in text showing operators reference the <b>.notdef</b> glyph.  | UA1:7.21.8-1  | Object | M   | –   |