Ghent PDF Workgroup

Documentation

2005 Ghent PDF Workgroup Specifications

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1. Table of Contents

2. Introduction

On June 19th, 2002 the Ghent PDF Workgroup convened its first meeting. The purpose of the foundation of the group was to attempt to rationalize and unify the work of various international user associations in the area of the creation and preflighting of PDF files for the delivery of production-ready material. Since the inception of the workgroup it has been decided that the group membership should be broadened to accept vendors. In this way, a more even view can be taken of the problems that need to be solved to improve the creation and delivery of production-ready PDF files.
A full list of member organizations can be found at http://www.ghentpdfworkgroup.org/en/about_members_observers.php.

One of the early decisions of the workgroup was to base all specifications on the ISO Standard file format known as PDF/X (Portable Document Format/Exchange). Initially, the decision was to support only PDF/X-1a files as defined in ISO 15930-1:2001. This standard defines the delivery of files in CMYK or spot color (with various other restrictions). Since then, the workgroup has included PDF/X-3 (ISO 15930-3:2002). In 2005 the group decided to also allow non-PDF/X compliant specifications in market segments where this was absolutely necessary such as packaging and office document printing.

However, as acknowledged by the standard itself, using PDF/X in specific market niches may require additional restrictions in the file format.
This was corroborated by the work that has been done by the individual organizations in their efforts to normalize the delivery of PDF files in their individual markets.

A good example of such restrictions would be the resolution of continuous tone images. In the ISO standard, no attempt is made to define what “acceptable” or “unacceptable” resolutions would be. The workgroup decided that these boundaries would be different for, say, the commercial printing environment as opposed to the newspaper advertising market.

Using these elements, the workgroup devised a series of specifications for various market niches that further restrict the usage of PDF/X. These are referred to as PDF/X-Plus specifications.

One of the goals of the Ghent PDF Workgroup is to make it easy for its users to use the work of the workgroup, regardless of which vendor application that user happens to be using. As a result the Ghent PDF Workgroup created documentation, including reference implementations and test material, to make

it easier for vendors to implement the Ghent PDF Workgroup specifications in their particular application.

This document is the base specifications document; the other documentation can be found at http://www.ghentpdfworkgroup.org/en/specifications_2005.php. It is the intent of the Ghent PDF Workgroup to keep the specifications and documentation up to date and current with the demands of the industry.

2.1. Confidentiality

This document has been written by the documentation group of the Ghent PDF Workgroup. It is provided to the public at large; its contents are public.

2.2. Copyright

2.3. Disclaimer

2.4. Feedback

Questions or remarks regarding this document should be forwarded to the Documentation Officer of the Ghent PDF Workgroup. You can do so by using the feedback form on the Ghent PDF Workgroup web site at: http://www.ghentpdfworkgroup.org/en/feedback.php.

3. Terminology

3.1. Specification

In the world of the Ghent PDF Workgroup, a *specification* is a set of guidelines to which a PDF file should conform. A practical example of a guideline could be the color spaces allowed in a PDF file or the image resolution required for images in a PDF file.
The Ghent PDF Workgroup defines a number of different specifications. The reason multiple specifications exist is to support different market segments, different output processes or different workflows. As a practical example, a magazine advertisement workflow is going to have totally different guidelines than a newspaper workflow.

3.2. PDF/X-Plus

Almost all Ghent PDF Workgroup specifications are PDF/X-Plus specifications. This means that they are based on a PDF/X standard. In case of the 2005 specifications the PDF/X standard in question is either PDF/X-1a:2001 or PDF/X-3:2002. The PDF/X-Plus specifications add additional restrictions on top of the restrictions in effect in the PDF/X standards.

3.3. Compliant PDF File

A PDF file that follows the guidelines of a given specification is said to be compliant to that particular specification. Such a PDF file is much more likely to pass correctly through a workflow for which the particular specification has been written.
Any PDF file that is compliant to one of the PDF/X compliant specifications is also automatically a compliant PDF/X file. It is worthwhile to note however that as of 2005 not all specifications are PDF/X-Plus specifications and thus not all compliant PDF files are automatically PDF/X compliant (PDF files compliant with the packaging specification for example are not PDF/X compliant).

3.4. Compliant Applications

Applications can be called compliant to one or more of the Ghent PDF Workgroup specifications. Compliant applications are applications that have been verified to correctly create, verify, process or output PDF files according to the guidelines of one or more specifications. The following chapter defines this concept more in detail.

3.5. Reference Implementations

While the specifications themselves define a theoretical concept (an abstract set of guidelines to which a PDF file must conform) the Ghent PDF Workgroup also develops reference implementations for those specifications.
Reference implementations are settings for specific vendor applications to make those vendor applications compliant with the specifications. The reason this is done is to:

a) Provide practical documentation on how the abstract specification can be implemented using real-world software
b) Provide a test platform so that the abstract specifications can be thoroughly tested before being released.

These reference implementation are not strictly a part of the specifications. A contradiction between the specification guidelines and the reference implementation is however indicative of a possible problem in either the specification or the reference implementation and should be examined by the Ghent PDF Workgroup.

4. Compliant Applications

4.1. *Introduction*

The terminology list defines compliant applications as "...applications that have been verified to correctly create, verify, process or output PDF files according to the guidelines of one or more specifications".
This definition implies two things.

1. In its particular field of operation in a workflow, the compliant application must behave in accordance to the guidelines of the specification it wants to be compliant to.
2. This compliancy needs to be verified.

This chapter details both points.

4.2. *Correcting PDF Files*

An important introductory remark is that a specification provides guidelines to which a PDF file must comply in order to be a compliant PDF file. Compliant applications must handle PDF files correctly.
This could be read in such a way that compliant applications must be able to correct non-compliant PDF files in such a way that they become compliant but this is not the case.
A compliant application has a choice. Adobe Acrobat Distiller for example might choose to make a PDF file PDF/X-1a compatible if it is not, but it may also fail the process and not produce a PDF file. Enfocus PitStop Professional might correct an error found during preflight but it may also fail the PDF file and not allow it to pass to the rest of the workflow.
In summary, compliant applications do not need to be able to correct all non-compliant PDF files, but they are required to handle them correctly; stopping the files that cannot be made compliant.
It is worthwhile to note that not all currently compliant applications behave in this way yet. Adobe Acrobat Distiller for example is set to warn about certain issues but still continue a PDF document. The reason for this is connected to the expectation that Acrobat Distiller will be used in workflows where these problems can be detected and/or fixed later on in the workflow.

4.3. *Compliant Application Requirements*

A compliant PDF file that passes through a workflow goes through a number of processes. Each of these processes requires different tasks from a compliant application. This divides compliant applications into a number of different types.

4.3.1. PDF File Creation

A compliant application that creates PDF files must be able to create PDF files that comply to the guidelines in the Ghent PDF Workgroup specifications.

If problems in the original file (remark that this section is broader than simply PostScript to PDF conversion) prohibit generation of a compliant PDF file, the application shall stop such a non-compliant PDF file to go further in the workflow. How this is handled is application dependant and outside the scope of this document.

4.3.2. PDF File Verification

A compliant application that verifies PDF files must be able to verify all conditions in the specification guidelines. It must be able to discern and report two different statuses:

1. Error: this is a condition marked in the specification details further in this document with the word “shall”. It is a fatal condition that shall stop the file from going further in the workflow.
2. Information: this is a condition marked in the specification details further in this document with the word “should”. It is a condition that merits being brought to the attention of the workflow manager but that does not warrant stopping the file.

How these conditions are reported, made visual or stored is application dependant and outside the scope of this document.

4.4. Error and Feedback Terminology

The Ghent PDF Workgroup specifications provide clear English guidelines for PDF files. The specifications do not specify how file creation options, file verification options, errors and informational messages should be communicated back to the user.
The language used in the specifications might not be (and almost certainly is not) the best way to communicate with the user of a compliant specification. The language used in the reference implementations might be better, but keep in mind that these reference implementations are vendor applications and as such almost certainly covered by vendor held copyrights.

4.5. Compliance Verification

In order to be called compliant with one or more of the Ghent PDF Workgroup specifications the following two steps need to be taken:

1) The vendor needs to verify compliance (and if necessary adjust the software) so that the guidelines in this document are followed. In order to help with this process more information is available from the Ghent PDF Workgroup:
    a. Test files to make it easier to test some of the guidelines
    b. Reference implementations for some parts of the workflow
2) The software needs to be independently verified by the Ghent PDF Workgroup. This process is currently managed by Eddy Hagen (eddy.hagen@vigc.be) from the VIGC. The VIGC is appointed by the Ghent

PDF Workgroup to do the actual compliance testing (depending on the actual testing that needs to be done, the VIGC will charge for their services).

In order to start the compliance verification process for one or more applications, contact Eddy Hagen directly.

4.6. *Guidelines for the use of the Ghent PDF Workgroup name*

Developers are encouraged to refer to the Ghent PDF Workgroup specifications in their marketing literature. However, care should be exercised.

If the application conforms to the whole set of specifications for 2005, the claim of “Conforms to all 2005 Ghent PDF Workgroup PDF/X-Plus specifications” is appropriate.

If the application implements or is compliant with only part of the specifications this should be clearly indicated in the wording. “Conforms to “specification name 1” and “specification name 2” of the 2005 Ghent PDF Workgroup specifications” is appropriate.

If an application performs more than one function (for example supports PDF file creation *and* performs PDF file verification) it should be very clear which aspects of the application are compliant with what.

For example, the conformance claim for a preflight application for newspaper ads should read “Conforms to the “NewspaperAds_1v3” specification of the 2005 Ghent PDF Workgroup specifications”.

Failure to comply with these guidelines may result in action being taken by the Executive Committee of the Ghent PDF Workgroup.

5. 2005 Specification Guidelines

5.1. Changes since the 2004 Specifications

The specifications for 2005 bring some marked new developments to the table:

- The standard set of specifications has been fully updated for the newest software releases, including Adobe Acrobat 7 and Adobe InDesign CS 2
- The packaging subcommittee delivered its first packaging specifications.

In order to make it easy for someone to spot the differences, each section in the specification details chapter that changed compared to the 2004 specifications has been marked with an extra indicator [2005].

5.2. Changes since the 2003 Specifications

The following are the main changes between the 2003 and 2004 specifications:

a. Having a year's worth of experience with the specifications in the field caused a number of corrections. On top of that a small number of inconsistencies in the specifications has been ironed out in this release.
b. The advent of a new Adobe Acrobat and associated PDF version caused extra checking and an adjustment to some of the guidelines.

In order to make it easy for someone to spot the differences, each section in the specification details chapter that changed compared to the 2003 specifications has been marked with an extra indicator [2004].

5.3. The Role of PDF/X

In 2004 we could simply state that all Ghent PDF Workgroup specifications were based on and compliant with the PDF/X standards. In 2005 we need to qualify this statement because of the addition of the packaging specifications. In packaging, features such as support for live transparency in PDF files and support for multiple layers are important and necessary. In the versions of PDF/X supported by the Ghent PDF Workgroup (PDF/X-1a:2001 and PDF/X-3:2002) those features are not allowed. As a result the packaging specification is not PDF/X compliant.
All other specifications are still compliant with the PDF/X standards as before.

5.4. Market Segments

For 2005 the Ghent PDF Workgroup specifications are restricted to the following market segments:

- Advertising for newspapers
- Advertising for magazines
- Commercial sheet offset printing
- Commercial web offset printing

- Commercial gravure offset printing
- Packaging

Other market segments are under consideration for the 2006 specifications.

5.5. Consistency between Creation and Verification Guidelines

A guideline throughout the creation of the specifications was to adopt the same guidelines for creation and verification of PDF files. This can be easily seen in the reference implementations for the specifications.
The reason for this (apart from the fact that it makes sense from a theoretical point of view) is that receivers will receive PDF files generated through a multitude of different creation methods.

5.6. Problem Reporting

The Ghent PDF Workgroup specifications deliberately try to minimize the number of 'informational' items reported (also referred to as 'warnings'). The reason for this is that such items tend to be neglected by users in many practical situations. As such they do not offer much additional value.

5.7. PDF/X and Color Usage

The Ghent PDF Workgroup decided to release only PDF/X-1a based specifications; obviously those allow only gray, CMYK and spot color.
At the same time the Ghent PDF Workgroup has been working to deliver fully PDF/X-3 compliant specifications, this time not restricted to the same color spaces as PDF/X-1a but allowing the use of all legal PDF/X-3 color spaces. These specifications were not ready in time for formal delivery but will be released at a later time when they could be sufficiently tested.

6. 2005 Specification Details – Excluding Packaging

This chapter does not describe the 2005 packaging specifications; these are described in the next chapter. The reason for this is that the packaging specifications are not PDF/X compliant and that the difference with all other specifications is still substantial.

6.1. Terminology and Guidelines

This chapter defines what the rules are for a compliant PDF file. The first section lists common requirements; requirements valid for all specifications. The second section lists requirements that are valid for a subset of the specifications.

Throughout the requirements the official names of the specifications are used to refer to them. These names and their explanation are defined in a separate document: ”Specification Naming Convention”.

The verb ”shall” is used for mandatory requirements. If a PDF file is generated such a requirement must be followed. During preflight a violation of such a requirement must result in a preflight error.

The verb ”should” is used for suggested requirements. If a PDF file is generated it is suggested that such a requirement is followed. During preflight it is suggested that a violation of such a requirement results in an informational message.

The requirements listed are the ideal; they describe what the document receivers represented by the Ghent PDF Workgroup would like to detect in incoming PDF documents. Even though requirements are described as accurately as possible, requirements can be achieved or checked for in multiple ways.

6.2. Common Requirements

This section describes requirements that are applicable to all Ghent PDF Workgroup specifications for 2005 (except packaging).

6.2.1. PDF/X Compliancy

A PDF file shall be compliant to the ISO PDF/X-1a:2001 standard as defined by ISO 15930-1.

6.2.2. File Encoding & Compression [2004][2005]

To minimize file size, the data (streams) in a PDF file should be compressed where possible. The compression used shall of course follow the PDF/X standard.
Compression should not be used on metadata inside the PDF file so that such metadata is readily accessible.
Object compression as introduced by version 1.5 of the PDF format should not be used in a PDF file.
There is no longer a restriction on the use of ASCII encoding in PDF files.

6.2.3. Use of Adobe PDFWriter

A PDF file shall not be created with the Adobe PDFWriter product.

6.2.4. Crop Box

A PDF file shall have no crop box defined or shall have a crop box set to the same size as the Media Box so that the entire media size is visible when the PDF file is opened in Adobe Acrobat or Adobe Reader.

6.2.5. Objects off the Page

A PDF file should not contain objects that are completely off the page (as defined by the MediaBox).
A first (and valid) approximation of this general rule is that PDF files should avoid having objects whose bounding box lies completely off the page.
More complex cases such as stroked rectangles that enclose, but not overlap, the page should be removed as well. In reality those cases are rare and these objects can be skipped in the sake of ease of implementation.

6.2.6. Page Scaling [2005]

A PDF file shall not use the page scaling factor introduced in PDF 1.6. This ensures that a page will be printed with the same scale factor as it is displayed in Adobe Acrobat or Adobe Reader.

6.2.7. Multi-Channel Color spaces

A PDF file shall not use the NChannel color space introduced in PDF 1.6 to represent multi-channel colors with greater flexibility.

6.2.8. Custom Undercolor Removal Function [2005]

There are no longer restrictions placed on the use of UCR functions.

6.2.9. Custom Black Generation Function [2005]

There are no longer restrictions placed on the use of BG functions.

6.2.10. Rendering Intent Operator

The PDF operator to set rendering intent for objects (”ri”) shall not be used; a PDF file shall not have this operator in any page description stream.

6.2.11. Transparency

No object in a PDF file shall be transparent. Usage of the PDF transparency operators is allowed as long as they don’t create an actual transparency (meaning that so called ”null-transparency” is allowed).

6.2.12. TrueType Fonts [2004]

There are no longer restrictions placed on the use of TrueType fonts in PDF files.

6.2.13. Type 3 Fonts [2004]

There are no longer restrictions placed on the use of Type 3 fonts in PDF files.

6.2.14. Multiple Master Fonts

A PDF file shall not use Multiple Master fonts; it shall not contain an uninstantiated Multiple Master font, nor instances of a Multiple Master font.

6.2.15. City Fonts [2004]

There are no longer restrictions placed on the use of city fonts in PDF files.

6.2.16. Composite Fonts [2004]

A composite font is the official name used in the PDF reference manual for the type of fonts used typically, but not exclusively, for the representation of large character sets such as Japanese, Chinese...
Those fonts are typically subsetted, meaning that only the characters used are actually embedded in the PDF file. But they can under rare circumstances also be completely embedded (depending on the font, its usage in the PDF file and the generating application).
Such completely embedded composite fonts shall not be used in a PDF file. The reason for this restriction is that a fully embedded composite font will generate incorrect output (transposed characters) in some output methods.
Any composite font (regardless of its embedding state) should not be used in a PDF file. While it is assumed that composite fonts will mostly work, this particular guideline was added to make sure the use of composite fonts is reported (to aid in troubleshooting potential issues arising from their use).

6.2.17. OpenType Fonts [2005]

A PDF file shall not contain embedded OpenType fonts; directly embedding OpenType fonts was introduced in PDF 1.6.

6.2.18. Black Text

A PDF file should not use black text smaller than 12 points that is set to knock-out.

6.2.19. White Text

A PDF file shall not contain white text set to overprint.

6.2.20. 16-bit Images [2004]

Images using 16 bits per sample shall not be used in PDF files.

6.2.21. Layers [2004]

PDF files shall not use layers (as defined by the PDF specification).

6.2.22. Printable Annotations [2004]

A PDF file shall not contain annotations that are set to print. Remark that while this rule does not give extra restrictions to the use of annotations, such instructions are implied through compliance to the PDF/X-1a standard as explained earlier in this document.

6.2.23. Use of Specific Annotation type [2005]

A PDF file shall only use annotations of the following types: “Text”, “Link”, “FreeText”, “Line”, “Square”, “Circle”, “Polygon”, “Polyline”, “Highlight”, “Underline”, “Squiggly”, “Strike-out”, “Stamp”, “Caret”, “Ink” and “Popup”. All other annotation types are explicitly not allowed.

6.3. Specific Requirements

This section describes requirements that are different across the 2005 Ghent PDF Workgroup specifications. Possible causes are:

- The requirement is mandatory for one subset of the specifications but suggested for another subset
- The requirement is applicable to only a subset of the specifications
- The requirement requires different options for different specifications

Each of the following requirements is subdivided into different sections as needed to state the different requirements for different subsets of the specifications.

6.3.1. Page Size and Orientation

For: SheetCmyk, SheetSpotHiRes, SheetSpotLoRes

The page size and page orientation (as determined by the MediaBox) for all pages of a PDF file should be equal.

For: All other specifications

The page size and page orientation (as determined by the MediaBox) for all pages of a PDF file shall be equal.

6.3.2. Use of Empty Pages

For: SheetCmyk, SheetSpotHiRes, SheetSpotLoRes
A PDF file should not contain pages that are completey empty (have no PDF objects present on them). Objects that are lying completely outside of the TrimBox (and will thus not appear on the finished page) are not taken into account.
For: All other specifications
A PDF file shall not contain pages that are completely empty (have no PDF objects present on them).

6.3.3. Number of Pages

For: MagazineAds, NewspaperAds
The number of pages in a PDF file shall be exactly one (1).

6.3.4. Ink Coverage [2005]

All: The guidelines for ink coverage described below can be implemented in different ways. The current reference implementation restricts the checks on ink coverage to simple, non-overlapping objects (i.e. it does not check images and gradients nor does it take into account what happens when overprinting objects overlap). This type of implementation is sufficient for compliancy but different vendors may use better implementations to provide additional value to the verification process.
For: NewspaperAds, WebCmykNews, WebSpotNews
Ink coverage of elements on a page inside the trim box should not exceed 240%.
For: MagazineAds, WebCmykHiRes, WebSpotHiRes,
Ink coverage of elements on a page inside the trim box should not exceed 310%.
For: SheetCmyk, SheetSpotHiRes, SheetSpotLoRes
Ink coverage of elements on a page inside the trim box should not exceed 340%.

6.3.5. Spot Color Naming [2004]

For: NewspaperAds, WebSpotNews
If the name of a spot color used in a PDF file ends on a suffix (such as 'CV', 'CVU'...), the suffix should be ' U'.
For: WebSpotHiRes, SheetSpotHiRes, SheetSpotLoRes
If the name of a spot color used in a PDF file ends on a suffix (such as 'CV', 'CVU'...), the suffix should be ' C'.

6.3.6. Use of Spot Colors [2004]

For: NewspaperAds, WebSpotHiRes, WebSpotNews, SheetSpotHiRes, SheetSpotLoRes
A PDF file should not use spot colors. Cyan, Magenta, Yellow and Black are not counted as spot colors even if they are specified as separation colors or as part of a Device-N color space. The spot color ”All” is not counted as a spot color.
For: MagazineAds, WebCmykHiRes, WebCmykNews, SheetCmyk
A PDF file shall not use spot colors. Cyan, Magenta, Yellow and Black are not counted as spot colors even if they are specified as separation colors or as part of a Device-N color space. The spot color ”All” is not counted as a spot color.
For: NewspaperAds
A PDF file shall not use more than 1 spot color. Cyan, Magenta, Yellow and Black are not counted as spot colors even if they are specified as separation colors or as part of a Device-N color space. The spot color ”All” is not counted as a spot color.

6.3.7. Ambiguous Spot Colors

For: NewspaperAds, WebSpotHiRes, WebSpotNews, SheetSpotHiRes, SheetSpotLoRes
A PDF file should not use spot colors that are ambiguous. Ambiguity is defined as:

1. Having the same name, but different CMYK equivalents.
2. Having a different name, but equal CMYK equivalents.

6.3.8. Use of Artificial Font Styles [2005]

There are no longer restrictions placed on the use of artificial font styles in PDF files.

6.3.9. Small Text

For: MagazineAds, WebCmykHiRes, WebSpotHiRes
A PDF file should not contain text that is smaller than 5 points or text that is smaller than 9 points and colored with more then 2 color separations.
For: NewspaperAds, WebCmykNews, WebSpotNews
A PDF file should not contain text that is smaller than 8 points or text that is smaller than 10 points and colored with more then 2 color separations.
For: SheetCmyk, SheetSpotHiRes, SheetSpotLoRes
A PDF file should not contain text that is smaller than 5 points or text that is smaller than 8 points and colored with more then 2 color separations.

6.3.10. Line Weight

For: WebCmykHiRes, WebSpotHiRes, WebCmykNews, WebSpotNews, SheetCmyk, SheetSpotHiRes, SheetSpotLoRes

Line weight of elements in a PDF file should not be less than 0.14 points.

6.3.11. Image Resolution [2004]

For: NewspaperAds, WebCmykNews, WebSpotNews
Resolution of color and grayscale images shall not be below 100 dpi and should not be above 300 dpi. Resolution of 1-bit images (either regular images or image masks) shall not be below 550 dpi and should not be above 1905 dpi.
For: MagazineAds, WebCmykHiRes, WebSpotHiRes, SheetCmyk, SheetSpotHiRes
Resolution of color and grayscale images shall not be below 150 dpi and should not be above 450 dpi. Resolution of 1-bit images (either regular images or image masks) shall not be below 550 dpi and should not be above 3600 dpi.
For: SheetSpotLoRes
Resolution of color and grayscale images should not be below 150 dpi and should not be above 450 dpi. Resolution of 1-bit images (either regular images or image masks) should not be below 550 dpi and should not be above 3600 dpi.

6.3.12. Image Compression [2004]

For: NewspaperAds, WebCmykNews, WebSpotNews, MagazineAds, WebCmykHiRes, WebSpotHiRes
1-bit images shall not use JBIG compression. Images shall not use JPEG2000 compression.
For: SheetCmyk, SheetSpotHiRes, SheetSpotLoRes
A PDF file shall not contain color or grayscale images that are not compressed or that are compressed using 'runlength' compression.
A PDF file shall not contain 1-bit images that are not compressed, or that are compressed using 'runlength' or 'zip' compression.
Images shall not use JPEG2000 compression.

6.3.13. Metadata [2004]

No further restrictions are placed on the use of thumbnails, bookmarks, article threads or unused destinations.

7. 2005 Specification Details for Packaging

This chapter contains the 2005 Packaging specification details. The reason this specification is described in a separate chapter is that the current packaging specification is not PDF/X compliant and as such differs substantially from the other specifications.
Since the packaging specification is still largely PDF/X compliant (deviations from this rule are clearly the exception for those cases where it is absolutely necessary), this chapter still states that a compliant PDF file should be PDF/X compliant with the exception of the limited exceptions stated. Those exceptions are clearly marked where the rules are described throughout this chapter.

7.1. Terminology and Guidelines

This chapter defines what the rules are for a compliant PDF file.

The verb ”shall” is used for mandatory requirements. If a PDF file is generated such a requirement must be followed. During preflight a violation of such a requirement must result in a preflight error.

The verb ”should” is used for suggested requirements. If a PDF file is generated it is suggested that such a requirement is followed. During preflight it is suggested that a violation of such a requirement results in an informational message.

The requirements listed are the ideal; they describe what the document receivers represented by the Ghent PDF Workgroup would like to detect in incoming PDF documents. Even though requirements are described as accurately as possible, requirements can be achieved or checked for in multiple ways.

7.2. Requirements

The rest of this chapter describes the actual requirements a compliant PDF file must obey to in order to be called compliant.

7.2.1. PDF/X Compliancy

A PDF file shall be compliant to the ISO PDF/X-1a:2001 standard as defined by ISO 15930-1, except where rules in this chapter allow deviations from this rule. Those deviations are clearly marked in the title with [PDF/X Exception].

7.2.2. PDF Version [PDF/X Exception]

PDF/X imposes the rule that the PDF version of a compliant file shall be 1.3 or lower. This rule is relaxed to state the the PDF version should be 1.4 or lower.

7.2.3. File Encoding & Compression

To minimize file size, the data (streams) in a PDF file should be compressed where possible, without subsequent use of ASCII encoding. The compression used shall of course follow the PDF/X standard.
Compression should not be used on metadata inside the PDF file so that such metadata is readily accessible.

7.2.4. Document Title [PDF/X Exception]

PDF/X imposes rules on the document title; these rules are not imposed in this specification.

7.2.5. Document Dates [PDF/X Exception]

PDF/X imposes rules on the document creation and modification dates; these rules are not imposed in this specification.

7.2.6. Trap Flag [PDF/X Exception]

In PDF/X documents, the state of the “trapped” flag must indicate that either that the document is not trapped or that it is trapped. This demand is not imposed in this specification.

7.2.7. Use of Adobe PDFWriter

A PDF file shall not be created with the Adobe PDFWriter product.

7.2.8. Page Boxes [PDF/X Exception]

PDF/X imposes rules on the different page boxes in PDF/X documents; these rules are not imposed in this specification.

7.2.9. Use of Empty Pages

A PDF file should not contain pages that are completely empty (have no PDF objects present on them).

7.2.10. Spot Color Naming

If the name of a spot color used in a PDF file ends on a suffix (such as ’CV’, ’CVU’...), the suffix should be ’ C’.

7.2.11. Use of Spot Colors

The use of spot colors in compliant PDF files is allowed, as long as they are properly formed in compliance to the PDF file format and the PDF/X standard. The reason this (seemingly evident) rule is present in this document is because the preflight reference implementation seems to suggest that spot colors are not allowed. The particular setup used in the preflight reference

implementation's check on spot color use, is to ensure that information about the spot colors used in a file is listed in the preflight report of that application.

7.2.12. Ambiguous Spot Colors

A PDF file shall not use spot colors that are ambiguous. Ambiguity is defined as:

1. Having the same name, but different CMYK equivalents.
2. Having a different name, but equal CMYK equivalents.

7.2.13. Custom Undercolor Removal Function

A PDF file should not contain custom UCR functions for objects in any color space.

7.2.14. Custom Black Generation Function

A PDF file should not contain custom BG functions for objects in any color space.

7.2.15. Custom Halftone [PDF/X Exception]

A PDF file should not contain custom halftone for objects. This is a deviation from the PDF/X standard because it might cause certain forbidden types of halftone to be used in files compliant with this specification.

7.2.16. Rendering Intent Operator

The PDF operator to set rendering intent for objects ("ri") shall not be used; a PDF file shall not have this operator in any page description stream.

7.2.17. Type 3 Fonts

A PDF file should not use Type 3 fonts

7.2.18. Multiple Master Fonts

A PDF file shall not use Multiple Master fonts; it shall not contain an uninstantiated Multiple Master font, nor instances of a Multiple Master font.

7.2.19. Composite Fonts

A composite font is the official name used in the PDF reference manual for the type of fonts used typically, but not exclusively, for the representation of large character sets such as Japanese, Chinese...
Those fonts are typically subsetted, meaning that only the characters used are actually embedded in the PDF file. But they can under rare circumstances also be completely embedded (depending on the font, its usage in the PDF file and the generating application).

Such completely embedded composite fonts shall not be used in a PDF file. The reason for this restriction is that a fully embedded composite font will generate incorrect output (transposed characters) in some output methods.

7.2.20. Font Embedding

A PDF file shall of course obey the PDF/X rules on font embedding. On top of that a PDF file shall not contain any fully embedded fonts (in other words, all fonts in the PDF file shall be subsetted).

7.2.21. Black Text

A PDF file should not use black text smaller than 12 points that is set to knock-out.

7.2.22. White Text

A PDF file shall not contain white text set to overprint.

7.2.23. Image Resolution

Resolution of color and grayscale images shall not be below 280 dpi and should not be above 450 dpi. Resolution of 1-bit images (either regular images or image masks) shall not be below 2000 dpi and should not be above 3600 dpi.

7.2.24. Image Compression

Color or grayscale images shall be uncompressed or shall be compressed using ZIP compression.
1-bit images shall be uncompressed or shall be compressed using ZIP compression.

7.2.25. Trapnet Annotations [PDF/X Exception]

PDF/X imposes rules on trapnet annotations; these rules are not imposed in this specification.

7.2.26. PDF/X Version Key [PDF/X Exception]

PDF/X imposes rules on the PDF/X version key; these rules are not imposed in this specification.

7.2.27. Pre-separated Pages [PDF/X Exception]

PDF/X imposes rules on pre-separated pages; these rules are not imposed in this specification.

7.2.28. Unknown Objects [PDF/X Exception]

PDF/X imposes rules on unknown objects; these rules are not imposed in this specification.

7.2.29. Annotations [PDF/X Exception]

A PDF file shall not contain annotations that are set to print; all other rules on annotations as imposed by the PDF/X standard are not imposed by this specification.