



PDF/A-1 in Acrobat 9 and LiveCycle ES

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This document is intended for the use of Sales Engineers, Technical Account Managers, Support Specialists and Consultants looking for guidance and information regarding PDF/A for enterprise customers. This technical document answers some key questions about the generation and validation of PDF/A. Although the baselines for this article is Acrobat/Reader 9.0 and LiveCycle ES Update 1 (8.2), references are made to other versions with regard to history and future direction.

APPLIES TO

LiveCycle ES (version 8.x)
Acrobat 9.x

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PDF/A-1

There are two levels of PDF/A-1 compliance:

- **PDF/A-1b** - Compliance with all requirements of 19005-1 necessary to preserve the visual appearance of a PDF/A file
- **PDF/A-1a** - Compliance with all requirements of 19005-1 including those regarding structural and semantic tagging

PDF/A Generation and validation principles

PDF/A is an ISO standard (19005-1) designed for long term archiving of documents in PDF format. It is essentially a subset of PDF 1.4 with some restrictions on what must be in the file. For example, PDF/A files do not rely on external fonts. Instead, all fonts used must be embedded in the PDF.

Note: The PDF/A standard specifies the behavior of a conforming reader. Acrobat/Reader 9 meets these standards and is a requirement when working with PDF/A. Earlier versions of Acrobat/Reader are not conforming.

There are two fundamental ways to produce a PDF/A file. The first is to generate the PDF/A directly from an application. In this case, the generating application includes everything in the file that is required (for example, fonts) and takes care to not include things that are disallowed (for example, PDF 1.7 constructs). So the generation program requires information about PDF/A and is more likely to generate compliant PDF/A.

The second way takes an existing PDF file and converts it to a compliant PDF/A file. The fact that a conversion must take place implies that there are some aspects of the original PDF that are not PDF-A-compliant. Any conversion program must decide how to handle the non-compliant items and act accordingly. Some require manual work to make the PDF/A-compliant, others are more draconian in order to produce a successful conversion if at all possible.

Note: Direct generation of PDF/A is preferred over PDF to PDF/A conversion.

Available tools

Adobe provides two sets of tools for creation of PDF/A and two sets of tools for verifying PDF/A compliance. The set of tools provided for desktop users are packaged with Acrobat and include Preflight (for conversion and validation) and Distiller and PDF Makers for generation. The set of tools provided for use on servers are part of LiveCycle ES. These tools include LiveCycle Output ES (for generation), LiveCycle PDF Generator ES (for generation) and the Assembler service (for conversion and validation). LiveCycle PDF Generator ES depends on some parts of Acrobat.

Not only do these tools differ in their deployment and use, they also differ in the philosophy behind them. These differences are especially true in the conversion process.

Note: The Acrobat-based tools are intended for desktop use and expect the user to interact with the process by manually resolving errors and issues. The LiveCycle ES-based tools are server oriented and attempt to do everything possible to create the successful output without manual intervention.

The following table provides a short summary of the available tools and their purpose. Although Acrobat has a "batch" capability, the processing of individual files still require interactive involvement from the user.

Source	Tool	Function	Usage	1a	1b
Acrobat	PDFMakers	generation	interactive	yes	yes
Acrobat	Distiller	generation	interactive	yes	yes
Acrobat	PreFlight	conversion	interactive	yes	yes
Acrobat	PreFlight	validation	interactive	yes	yes
LiveCycle ES	LiveCycle PDF Generator ES	generation	automated	yes	yes
LiveCycle ES	LiveCycle Output ES	generation	automated	yes	yes
LiveCycle ES	Assembler	conversion	automated	no	yes
LiveCycle ES	Assembler	validated	automated	no	yes

Understanding the PDF/A generation and compliance tools

This section provides details on PDF/A generation and compliance checking from the perspective of each of the various tools.

PDF/A generation tools

There are many different ways to generate PDF/A using Acrobat or LiveCycle ES. This section discusses them and describes known issues, works around and suggestions for most effective use of that method. If you are unable to generate good PDF/A using one method, search through the other methods for alternative suggestion that to solve your problems.

PDF Makers in Acrobat

Acrobat provides PDF Makers for many common file formats used by Microsoft Office (2003 and 2007). The following lists the results when using Acrobat 9.0.

Note: The word "usually" is use as there are so many variations in Office documents, versions and fonts that we can never be sure of the behavior.

Application and File Type	Task	Acrobat 9.0 Result	Acrobat 9.0 Preflight check	Acrobat 9.1 Result	Acrobat 9.1 Preflight check
Office 2003	Generating a PDF/A file directly	Usually compliant	Shows non-compliant (except for PowerPoint)	Usually compliant	Usually shows compliant
Office 2003	Generating a PDF file and converting it to PDF/A using Preflight	Usually non-compliant	Shows non-compliant	Usually non-compliant	Usually shows non-compliant
Office 2003	Generating a PDF file and converting it to PDF/A using Assembler	Usually compliant	Usually non-compliant	Usually compliant	Usually shows compliant
Office 2003	Printing to a PostScript file (i.e. a PRN file) and distilling it to PDF/A	Usually compliant	Usually shows compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2003 files (.doc, .ppt)	Generating a PDF/A file directly,	Usually compliant	Shows non-compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2003 files (.doc, .ppt)	Saving the file to Office 2007 format and then generating a PDF/A file directly	Usually compliant	Shows compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2003 files (.doc, .ppt)	Generating a PDF file and converting it to PDF/A using preflight	Usually non-compliant	Shows non-compliant	Usually non-compliant	Usually shows non-compliant

Application and File Type	Task	Acrobat 9.0 Result	Acrobat 9.0 Preflight check	Acrobat 9.1 Result	Acrobat 9.1 Preflight check
Office 2007 For Office 2003 files (.doc, .ppt)	Generating a PDF file and converting it to PDF/A using Assembler	Usually compliant	Usually shows non-compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2003 files (.doc, .ppt)	Printing to a PostScript file (i.e. a PRN file) and distilling it to PDF/A	Usually compliant	Usually shows compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2007 files (.docx, .pptx)	Generating a PDF/A file directly	Usually compliant	Usually shows compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2007 files (.docx, .pptx)	Generating a PDF file and converting it to PDF/A using preflight	Usually non-compliant	Shows non-compliant	Usually non-compliant	Usually shows non-compliant
Office 2007 For Office 2007 files (.docx, .pptx)	Generating a PDF file and converting it to PDF/A using Assembler	Usually compliant	Usually shows non-compliant	Usually compliant	Usually shows compliant
Office 2007 For Office 2007 files (.docx, .pptx)	Printing to a PostScript file (i.e. a PRN file) and distilling it to PDF/A	Usually compliant	Usually shows compliant	Usually compliant	Usually shows compliant

Known issues in Acrobat 9.0

Issue	Comment
Office 2007 / Performance / PDF/ A or X: PDFMaker performance is badly impacted if an image appears with a clip-art fill. (1879302)	Fixed in Acrobat 9.1
Preflight fails PDF/A-compliant files if /CompressPages is set to false (1866100)	Fixed in Acrobat 9.1
Print Route: Whenever a word document containing headings 7, 8 and 9 is converted to PDF/A-1a-compliant file then preflight throws an error. (1835863)	Fixed in Acrobat 9.1
Distiller incorrectly produces PDF/A-1b file in which Image has OPI information. (1909573)	Fixed in Acrobat 9.1

Issue	Comment
Distiller generated PDF/A file for this PS violates ISO standards (1765846)	Deferred to future Acrobat release
PDF/A conversion not removing annotations. (1894737)	Deferred to future Acrobat release
Preflight removes actions that are not PDF/A-compliant when converting to PDF/A (1906217)	Deferred to future Acrobat release
PPTX files not converting - Real value out of range (1921766)	Deferred to future Acrobat release
XLSX files. Font not embedding (1921721)	Deferred to future Acrobat release

Preflight conversion in Acrobat

Preflight in Acrobat 9.0 can convert PDF files to PDF/A. But in the process, the conversion software from Adobe ensures that no information is lost from the file. Hence, the conversion is not always successful. For example, PDF file that depends on some PDF 1.7 feature and that feature cannot be expressed in PDF 1.4 then the information is included in the output file. But the output file is not PDF/A-compliant. The conversion tool generates warning messages for this type of occurrence. Here are two examples of reasons for a possible failure:

1. The original PDF used some feature of a PDF version later than the PDF/A standard. For example, if the original PDF was a dynamic XFA PDF, the converter would not create a PDF/A-compliant file from it. Alternatives are to flatten the PDF to a non-interactive PDF/A or to regenerate a non-interactive PDF/A directly from the template and data.
2. The original PDF file contained XMP metadata that was not predefined in the XMP standard version used in PDF/A and the PDF did not include an embedded schema for that metadata.

Preflight is powerful and can repair many of the errors that the conversion process reports. The converter does not make changes automatically, since they imply some change to the underlying PDF and hence need verification by someone checking the file. Users are encouraged to examine Preflight and to understand how it can help.

Common issues in Acrobat 9.0

The most common problem discovered in PDF/A conversion in Acrobat 9.0 was that many of the PDF generation and conversion processes were including XMP metadata in the PDF file. This standard was in the current XMP spec but not in the 2004 spec that PDF/A is based on. However, the PDF/A standard provides a way to embed definitions (schema) for unknown XMP so that they can be used with PDF/A.

For Acrobat 9.1 certain XMP data nodes commonly inserted by the PDFMakers, The Preflight conversion process automatically deletes Distiller and LiveCycle ES services. This deletion allows the more file conversions without manual fix-ups. Specifically, the following properties are deleted:

- All properties in namespace "http://ns.adobe.com/pdfx/1.3/"
- The property "xmpMM:Subject" in namespace "http://ns.adobe.com/xap/1.0/mm/"

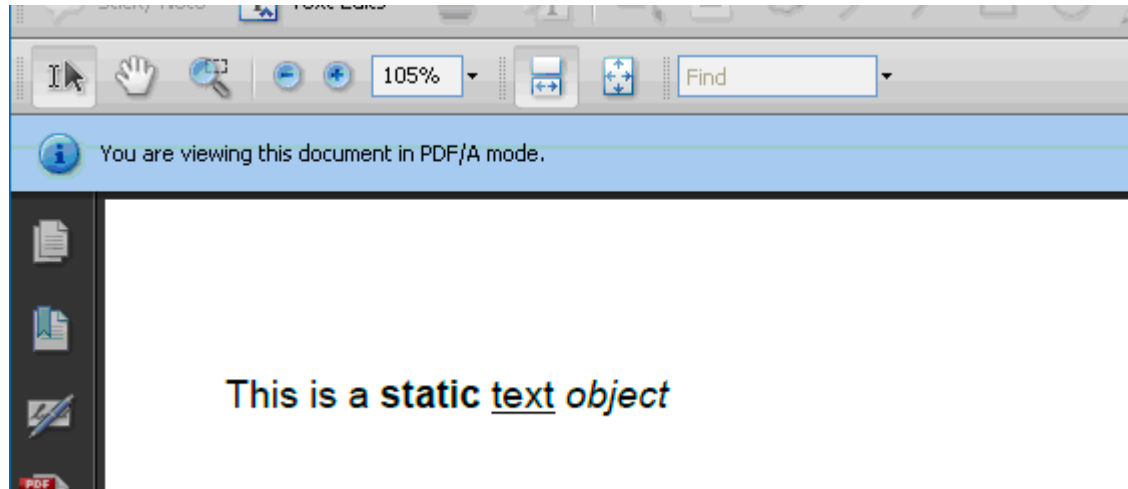
In a future Acrobat release, the list will be further increased especially in the area of conversions from PDF files generated by the Creative Suite applications.

Fixing PDF/A problems

If a user checks a PDF/A file and finds there are problems, address them by:

- reconverting the PDF/A file to PDF/A again
- directly fixing the problem using a different profile in Preflight.

Note: This is not normally possible because by default Acrobat 9.x opens a PDF/A file in PDF/A mode. as illustrated below in the Document Message Bar in Acrobat.



When Acrobat is in PDF/A mode, no changes are allowed to the file. If the user attempts to make a change, Preflight reports an error that says: "PDF Optimizer: This operation is not permitted". (This message is not clear and will be fixed in a future version of Acrobat.

In order to change PDF/A documents using Preflight, you must:

- disable PDF/A mode by going to Edit->Preferences->Documents
- change "View Documents on PDF/A mode to "Never"
- close the document and reopen it.

Conversion from PostScript in Acrobat Distiller

Acrobat Distiller converts a PostScript file (usually with a .prn extension) to PDF/A using Acrobat Distiller.

A PostScript stream normally contains no metadata and no advanced (or interactive) features and hence the PDF/A generation from the PRN is normally successful. However, there is a variation of PostScript called PDFMark (for more details, see the [PDFMark Reference](#)). PDFMark inserts special tags into the PostScript stream which are then turned into PDF structure by Distiller. Distiller does not support conversion of PDFMark files into PDF/A. Acrobat or LiveCycle do not convert PDF files created from PDFMark into PDF/A.

The following are known issues in Distiller in Acrobat 9.0.

Issue	Comment
Acrobat Distiller not able to convert a PostScript file to PDF/A-compliant PDF properly. (1891358)	Fixed in Acrobat 9.1
Print Route: Whenever a word document containing headings 7, 8 and 9 is converted to PDF/A-1a compliant file then preflight throws an error. (1835863)	Fixed in Acrobat 9.1
Acrobat Distiller generated PDF/A file for this PS violates ISO standards - some real numbers out of IEEE floating point range (1765846)	Deferred to future Acrobat release

LiveCycle PDF Generator ES

LiveCycle PDF Generator ES uses either the PDF Makers (for Microsoft Office files) or Distiller (for other file formats). Please read the information on these conversions (above) for guidance. In some cases, LiveCycle PDF Generator ES augments the XMP data handling in the Acrobat tools. These tools provide results that are not 100% the same in this aspect.

LiveCycle Output ES

LiveCycle Output ES (version 8.2.1) and SAP Interactive Forms by Adobe version 8.2.0 and later can generate PDF/A from a form and template.

Note: LiveCycle Output ES can generate PDF/A-1b only. The following table shows the known issues with PDF/A generation using these products.

Issue	LiveCycle ES (8.2)	SAP Interactive Forms by Adobe (8.2.0)	Acrobat Preflight
XMP meta data error (1879659)	Fixed in LiveCycle ES Update 1 SP1 (8.2.1.1).	Fixed	n/a
Transparency (1813007 & 1867818)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).	Fixed	n/a
Struct element (1817422)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).	Fixed	n/a
Arabic fonts embedded with inconsistent font character widths. (1522180)	No plan to fix	No plan to fix it	n/a
Meta data errors for http://ns.adobe.com/xap/ and http://purl.org/dc/ (1909383 & 1909384)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).	Fixed	n/a

Issue	LiveCycle ES (8.2)	SAP Interactive Forms by Adobe (8.2.0)	Acrobat Preflight
A PDF/A 1-b file generated by LiveCycle Output ES service is reported as non-compliant by Acrobat 9.1. This suggests a "Transparency used" error (1916439)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).	Open in RC	n/a
"Charset missing or incomplete for Type 1 embedded (as a subset) RGB (0.0/0.0/0.0)" (1921360)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).	Open in RC	n/a

Assembler service for generation

If Assembler is passed a file format other than PDF, it attempts to convert the file to PDF using the LiveCycle PDF Generator service. It then attempts to convert that PDF to PDF/A. This route is not always successful and should be avoided. Use PDF/G to generate PDF/A directly. See also the note regarding PDF/A-1a/b generation below.

Assembler service for conversion

Note: Assembler can only generate PDF/A-1b. It cannot generate PDF/A-1a. However, if it is used to merge two PDF/A-1a together the result is expected to still be PDF/A-1a-compliant.

Assembler converts an existing PDF to PDF/A. Its philosophy is different from Preflight. Since it is server-oriented, it attempts to make any necessary changes to the PDF to force compliance. The net result: it is usually more successful at converting to PDF/A without manual effort.

Specifically, Assembler will:

- override annotation flags
- remove hidden annots
- remove "NoView" annots
- remove invisible nonstandard annots
- remove optional content
- remove PostScript XObjects remove reference XObjects
- remove illegal annotations
- remove illegal actions
- remove illegal additional actions
- remove non-normal annot appearances
- remove XFA
- remove JavaScript name tree
- remove embedded files name tree

- remove illegal interpolation
- remove image alternates
- remove XObject OPI
- remove form XObject PS
- remove transfer functions
- embed fonts

Assembler provides control over:

- how much of the optional content is affected
- what output color space is intended (default=sRGB)
- whether signatures are to be archived (default="as needed")

If the input PDF was an XFA form, the result is a flattened form and the XFA is removed. If the form is signed, the signature information is archived into the document. Assembler uses other LiveCycle ES services (LiveCycle PDF Generator ES and LiveCycle Output ES) to accomplish some of this work.

Known issues

Issue	Comments
Fonts lost on fields (1896989)	Deferred to future releases of Acrobat and LiveCycle ES
The signature status is different on Weblogic/Solaris (1905149)	Fixed in LiveCycle ES Update 1SP2 (8.2.1.2)
Digital signature conversion adds XMP properties but a couple of the properties are misspelled and Preflight says there is no extended schema. Note: that Preflight 9.1 cannot handle the schema a reports a problem. (1912439)	There are two issues here: a) two of the properties added have misspelled values. This issue is fixed in LiveCycle ES Update 1 SP2 (8.2.1.2). b) Preflight can't handle the complex extended schema. This issue will be addressed in a future Acrobat release. Preflight 9.1 continues to report the error, even though the file generated by LiveCycle ES Update 1 SP2 (8.2.1.2) is compliant.

PDF/A validation tools

Acrobat 9.0 and Acrobat 9.1

Although PDF/A generation is of paramount importance, customers also need to the ability to validate PDF/A files. This provides them confidence in the long-term validity of their archived files. In Acrobat 8, the Preflight validation of PDF/A was focused on the display fidelity of the PDF/A file. In Acrobat 9.0, the checks were deepened to examine the internal structure of the files for compliance. Thus, files that have been tested as "compliant" in Acrobat 8.x now show some errors when checked in Acrobat 9.0.

The following chart indicates improvements to the validation feature made in Acrobat 9.

Low level file format validation (ISO 19005-1, 6.1)
<ul style="list-style-type: none"> ● File Header
<ul style="list-style-type: none"> ● File Trailer
<ul style="list-style-type: none"> ● Cross reference table
<ul style="list-style-type: none"> ● Objects (string, stream, etc.)
<ul style="list-style-type: none"> ● Implementation Limits
Low level from validation (ISO 19005-1, 6.3)
<ul style="list-style-type: none"> ● Matching widths
<ul style="list-style-type: none"> ● Presence and validity of CIDSet, CharSet, CIDToGIDMap, etc
<ul style="list-style-type: none"> ● CMap requirements
<ul style="list-style-type: none"> ● Encoding requirements
A few minor corrections to Annots and Actions (6.5 and 6.6)
Full XMP validation (6.7)
Basic struction validation (6.8)

In Acrobat/Reader 9.0 and LiveCycle ES Update 1 (8.2), some problems with PDF/A creation and validation were discovered. The intent is to find and fix the major issues in Acrobat 9.1 and in LiveCycle ES Update 1 SP2 (8.2.1.2).

Unfortunately there were some faults in the Acrobat 9.0 release where it reported errors on files that were indeed compliant. One of the largest areas, as noted earlier is in the XMP property validation. Acrobat 9.1 has focused on fixing as many of these issues as possible but there are still be some cases where errors are incorrectly reported. Future versions of Acrobat addresses these gaps.

Appendix A of this document lists all the XMP properties defined as part of the PDF/A-1 standard. This allows users to quickly determine whether a specific XMP property is permitted under the PDF/A-1 definition or if an extension schema is required for a property.

Note: We recommend that customers always validate PDF/A compliance using the latest available version of Acrobat.

Known issues in Acrobat 9.0

Issues	Comment
Preflight flags xmpMM:InstanceID as not predefined (1852068)	Fixed in Acrobat 9.1
Not all variations of XMP "Date" formats are properly implemented (1869372)	Fixed in Acrobat 9.1
Font problems are falsely reported (1869369)	Fixed in Acrobat 9.1

Issues	Comment
Font problems are reported on a specific font file (1869368)	Fixed in Acrobat 9.1
Preflight fails PDF/A-compliant files if /CompressPages is set to false (1866100)	Fixed in Acrobat 9.1
Adding Audit Trail invalidates compliant PDF/A-1b (1817458)	Deferred to future release of Acrobat
Preflight can't handle complex extension schemas. (1912743)	Deferred to future release of Acrobat

Assembler service

Assembler is also capable of validating PDF/A compliance. However, like PDF/A generation and conversion, Assembler can only validate PDF/A-1b.

Known issues with PDF/A-1b validation in Assembler

Issue	Comment
Preflight passes LiveCycle PDF Generator ES generated file but Assembler validation fails it (1924891)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).
Preflight passes LiveCycle PDF Generator ES generated file but Assembler validation fails it (1924892)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).
Preflight reports errors in LiveCycle PDF Generator ES generated file but LiveCycle Assembler validation passes it. (1924894)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).
Assembler validation reports font errors on PDF/A files from LiveCycle Output ES when Preflight does not. (1924050)	Fixed in LiveCycle ES Update 1 SP2 (8.2.1.2).

Appendix A

XMP entries permitted in PDF/A-1

The following table lists the XMP metadata properties which are permitted in PDF/A-1 files by default. Any other metadata values must be defined in an accompanying embedded schema. If a PDF/A-1 compliance checker returns an error message regarding an XMP value that is not defined in an extension schema, check that value against this list. If the value is found in the list, the message is wrong and indicates a bug in the validating software. If the value is not in this list, the message is correct and the file is not compliant.

<http://purl.org/dc/elements/1.1/dc:contributor>
<http://purl.org/dc/elements/1.1/dc:coverage>
<http://purl.org/dc/elements/1.1/dc:creator>
<http://purl.org/dc/elements/1.1/dc:date>
<http://purl.org/dc/elements/1.1/dc:description>
<http://purl.org/dc/elements/1.1/dc:format>
<http://purl.org/dc/elements/1.1/dc:identifier>
<http://purl.org/dc/elements/1.1/dc:language>
<http://purl.org/dc/elements/1.1/dc:publisher>
<http://purl.org/dc/elements/1.1/dc:relation>
<http://purl.org/dc/elements/1.1/dc:rights>
<http://purl.org/dc/elements/1.1/dc:source>
<http://purl.org/dc/elements/1.1/dc:subject>
<http://purl.org/dc/elements/1.1/dc:title>
<http://purl.org/dc/elements/1.1/dc:type>

<http://ns.adobe.com/xap/1.0/xmp:Advisory>
<http://ns.adobe.com/xap/1.0/xmp:BaseURL>
<http://ns.adobe.com/xap/1.0/xmp:CreateDate>
<http://ns.adobe.com/xap/1.0/xmp:CreatorTool>
<http://ns.adobe.com/xap/1.0/xmp:Identifier>
<http://ns.adobe.com/xap/1.0/xmp:MetadataDate>
<http://ns.adobe.com/xap/1.0/xmp:ModifierDate>
<http://ns.adobe.com/xap/1.0/xmp:Nickname>
<http://ns.adobe.com/xap/1.0/xmp:Thumbnails>

<http://ns.adobe.com/xmp/Identifier/qual/1.0/xmpidq:Scheme>

<http://ns.adobe.com/xap/1.0/rights/xmpRights:Certificate>
<http://ns.adobe.com/xap/1.0/rights/xmpRights:Marked>
<http://ns.adobe.com/xap/1.0/rights/xmpRights:Owner>
<http://ns.adobe.com/xap/1.0/rights/xmpRights:UsageTerms>
<http://ns.adobe.com/xap/1.0/rights/xmpRights:WebStatement>

<http://ns.adobe.com/xap/1.0/mm/xmpMM:DerivedFrom>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:DocumentID>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:History>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:ManagedForm>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:Manager>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:ManageTo>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:ManageUI>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:ManagerVariant>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:RenditionClass>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:RenditionParams>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:VersionID>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:Versions>
<http://ns.adobe.com/xap/1.0/mm/xmpMM>LastURL>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:RenditionOf>
<http://ns.adobe.com/xap/1.0/mm/xmpMM:SaveID>

<http://ns.adobe.com/xap/1.0/bj/xmpBJ:JobRef>

<http://ns.adobe.com/xap/1.0/t/pg/xmTPg:MaxPageSize>
<http://ns.adobe.com/xap/1.0/t/pg/xmTPg:NPages>

<http://ns.adobe.com/pdf/1.3/pdf:Keywords>
<http://ns.adobe.com/pdf/1.3/pdf:PDFVersion>
<http://ns.adobe.com/pdf/1.3/pdf:Producer>

<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:AuthorsPosition>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:CaptionWriter>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Category>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:City>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Country>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Credit>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop>DateCreated>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Headline>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Instructions>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Source>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:State>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:SupplementalCategories>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:TransmissionReference>
<http://ns.adobe.com/pdf/photoshop/1.0/photoshop:Urgency>

<http://ns.adobe.com/tiff/1.0/tiff:ImageWidth>
<http://ns.adobe.com/tiff/1.0/tiff:ImageLength>
<http://ns.adobe.com/tiff/1.0/tiff:BitsPerSample>
<http://ns.adobe.com/tiff/1.0/tiff:Compression>

<http://ns.adobe.com/tiff/1.0/tiff:PhotometricInterpretation>
<http://ns.adobe.com/tiff/1.0/tiff:Orientation>
<http://ns.adobe.com/tiff/1.0/tiff:SamplesPerPixel>
<http://ns.adobe.com/tiff/1.0/tiff:PlanarConfiguration>
<http://ns.adobe.com/tiff/1.0/tiff:YCbCrSubSampling>
<http://ns.adobe.com/tiff/1.0/tiff:YCbCrPositioning>
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