About PDF/X

Prinergy can generate PDF/X-1a:2001 and PDF/X-3:2003 files.

PDF/X is an exchange format for sending pages between a page preparation site and a printing site. PDF/X is a subset of the full PDF specification.

A PDF/X file is intended to be more predictable because it has commonly agreed-on characteristics. Using PDF/X does not guarantee the performance of a file, but a PDF/X file will be free of certain common prepress problems such as missing fonts and images, and non-press color space.

Outputting to PDF/X

If you are intending to output PDF/X, you must first choose Refine to PDF/X, rather than just outputting to PDF/X. Prinergy detects and deals with many PDF/X issues at the refine stage. When you select a PDF/X format when outputting, Prinergy checks the master files for PDF/X conformance. However, some issues, including font embedding, image replacement, and color conversion cannot be handled on output and cause Prinergy to fail the file.

What are the flavors of PDF/X?

PDF/X-1 family:

PDF/X-1:1999—approved by ANSI (American National Standards Institute) as PDF/X-1 in October 1999. This format is based on PDF 1.2 plus Adobe Tech Note 5188.

PDF/X-1:2001—approved by ISO (International Organization for Standardization) in April 2001. This format is based on PDF 1.3. It is an updated international version.

PDF/X-1a:2001—approved by ISO in April 2001. This format is based on PDF 1.3. Embedded files are not allowed. This is the version that Prinergy can refine to.

PDF/X-1a:2003—not yet approved, but the approval process is underway. This format is based on PDF 1.4, but will not allow such 1.4 features as transparency and JBIG2 compression.

PDF/X-2—not yet approved. All fonts must be embedded. PDF/X-2 does not use OPI; instead it uses a Global Unique ID (GUID) to reference an external file. The external files must be PDF/X-1 or PDF/X-3 files.

PDF/X-3:2002—approved by ISO in 2002. This format is based on PDF 1.3. It allows for PDF/X-1 color spaces plus L*a*b and RGB spaces.

PDF/X-3:2003—not yet approved, but the approval process is underway. This format is based on PDF 1.4, but does not allow such 1.4 features as transparency and JBIG2 compression.

Technical requirements of PDF/X-1a:2001 and PDF/X-3:2003

- Fonts must be embedded.
- If OPI is used, the high-resolution image must be swapped into the file and the OPI comment removed.
- Transfer functions (TR and TR2) are not allowed. Prinergy fails pages that contain custom transfer functions.
- Pre-separated pages are not allowed. For whole-page copydot DCS input, Prinergy will try to recomposite the file, which would allow a PDF/X-1a:2001-compliant page.
- Spot colors and CMYK are allowed; RGB and L*a*b* are not allowed.
- LZW and JBIG2 compression are not allowed.
- Bounding boxes are restricted. Each page must have a media box that can include either a trim box or an art box, but not both. A page can have a bleed box or crop box. The trim box or art box must be entirely inside the bleed box or crop box.
- Halftone issues:
    - Named halftones are not permitted. This means you cannot use DotShop screening, since Prinergy relies on the halftone name to choose the screening. When refining to PDF/X-1a: 2001, Prinergy removes any halftone dictionary that contains a HalftoneName key, including DotShop halftone dictionaries.

- There is no Halftone Phase (HTP key).
- Halftone Type can only be 1 or 5 (no threshold screening).
- Embedded PostScript fragments and PDF features beyond PDF 1.3 are not supported. Thus, transparency cannot be present; Prinergy flattens transparencies in PDF 1.4 input.
- Annotation use is limited. Annotations are allowed if they lie entirely outside the bleed box, or outside the art box or trim box if there is no bleed box. The exception is the TrapNet annotation, which is allowed without restrictions.
   Note: Prinergy does not use TrapNet annotations for trapping.

When refining to PDF/X, Prinergy detects and deals with all of the above issues where possible. If it is not possible to make a PDF/X-compliant file, Prinergy fails the file.

What happens during refining?

When you refine to PDF/X, the **Normalize**, **Optimize**, and **ColorConvert** options in the refine process template must be selected.
During the normalize process, Prinergy does OPI replacement and embeds fonts. The **Search for High-Resolution Images in Image Search Paths** option is enabled, though you can disable it. The **Fail on Missing Fonts** option is enabled and you cannot disable it.
During color conversion, the input color space is converted to CMYK plus spot colors.

CAUTION: If you have a L*a*b* PANTONE color library installed, selecting the **Look Up Recipe in Color Database** option in the **Source of Color Recipes** area of the **Spot Color Handling** section may cause Prinergy to fail the file. If the option is not selected, and color recipes are defined using L*a*b*, Prinergy may also fail the file. L*a*b* color space is not allowed for PDF/X-1a:2001 and PDF/X-3:2003 files.

During optimization, Prinergy checks for the remaining PDF/X issues. If it is not possible to create a PDF/X-compliant file, Prinergy fails the file.

What happens when I select PDF/X-1a:2001 when outputting in Prinergy?

The selected master files are checked for PDF/X-1a:2001 conformance, in case a master file was edited and a non-PDF/X-1a:2001 element or characteristic was introduced into the file. Some issues are corrected at this point. However, some issues —including font embedding, image replacement, and color conversion— cannot be handled at this point and cause Prinergy to fail the file. The file must then be refined to PDF/X-1a:2001 again.
If you select multiple pages and select **Save Pages to Separate Files** in the Publish PDF Files dialog box on output, the selected files are combined into one PDF/X-1a:2001 file.

What is the recommended workflow?

It is important to refine to PDF/X, because it ensures that your proof cycle is based on the same PDF/X file that is output and sent to the printer site.

1. Refine input files to PDF/X-1a: 2001
2. Refine (including OPI, font embedding, and color matching)
3. PDF/X-1a: 2001 digital master files are outputted. From the master files, you can:
   - Display in Acrobat View, or print on a printer which will accept PDF/X as an input type, OR
   - Export to PDF/X-1a, and send the files to a third party printer

Can I simply refine files to PDF as usual, and then output to PDF/X-1a:2001 on Vector JTP output?

Though it might be possible to do so in some cases, in general this is not the recommended way of working. In particular, color matching must be performed during refine. A file needing color matching will not be converted to PDF/X-1a:2001 on output if it has not been refined to PDF/X-1a:2001. Other issues addressed during refine include font embedding and OPI.

What happens during vector output (Publish PDF or Vector JTP)?

When you select PDF/X when outputting in Prinergy, the selected master files are checked for PDF/X conformance. This is in case a master file has been edited and a non-PDF/X element or characteristic has been introduced into the file. Some issues will be corrected at this point, but some issues—including font embedding, image replacement, and color conversion—cannot be handled at this point and will cause Prinergy to fail the file. The file must be refined to PDF/X again.

Must I do OPI replacement?

PDF/X-1a:2001 requires that files not contain OPI comments. The expectation is that OPI replacement was done and that the receiver of the PDF/X file needs no additional external resources (fonts or images) to process the file.
Prinergy does OPI replacement by default during refining to PDF/X-1a:2001. In some cases, the high-resolution image is embedded in the document but the file still contains OPI comments. An example of this is where high-resolution TIFF files are placed in QuarkXPress and printed as fat files. In these cases, Prinergy tries to perform OPI replacement in these cases and generates a warning or error.
If you are working in a non-OPI workflow, clear both the **Search for High-Resolution Images in Image Search PathsReplacement** and **Fail On Missing Images** check boxes in the refine process template.

Can I refine a PDF/X-1a:2001 file?

Yes. Prinergy treats a PDF/X-1a:2001 file like any PDF input file. The file can be refined to a regular PDF file, or it can be refined to a PDF/X-1a:2001 file again. If it is refined to a regular PDF file, it no longer has the PDF /X-1a:2001 identification keys. If it is refined to PDF/X-1a:2001, Prinergy checks it the same as any other input file that is refined to PDF/X-1a:2001.

What about PDF/X checkers?

Kodak has tested the following PDF/X checkers:

- Apago PDF/X-1 Checkup, version 2.5
- DDAP PDF/X Verifier version 2.0
- Callas pdfInspektor2, version 1.0
- Enfocus PitStop, version 5.02 using Profile: PDF/X-1a:2001 v2

In our testing, our PDF/X-1a output consistently passes the Apago and DDAP checkers.
We found that pdfInspektor2 and PitStop provide error notifications in the following cases even though the file is PDF/X-1a:2001-compliant:

- Callas pdfInspektor reports in all cases that "OutputIntent Info missing," even though all PDF/X-1a:2001 required information is present.
- Callas pdfInspektor reports the use of BX and EX operators as errors, even though the PDF/X-1a:2001 specification says these are okay. What is prohibited are non-PDF 1.3 operators, even within BX and EX.
- Enfocus PitStop reports that "Document does not use modern compression mechanisms." This is generated in PitStop by the "Compression is not optimal" check, which is not related to PDF/X-1a:2001. If this check is left out, this error is not reported.
- Enfocus PitStop reports "Custom halftone function found" whenever there is a Halftone (HT) key. But the Halftone key is permitted in a PDF/X-1a:2001 file if the Halftone Type is 1 or 5.

Are there any known issues with the implementation of PDF/X-1a:2001 in Prinergy?

If a PDF/X page that has the Trapped key set to true is brought into Prinergy and refined with the **Trap** section of the process template enabled, Prinergy tries to retrap the page.

When creating a PDF/X-1a:2001 output file, the Trapped key in the PDF/X-1a:2001 file is always set to false. This is because it is difficult to automatically determine if all trapping has been done.

If an input file is a PDF 1.4 file, then the master file has the PDF 1.4 version tag in it, and possibly a Metadata key. (Note that PDF 1.4 transparency will have been flattened.) On output (using vector PDF output, or Publish PDF output), the file has the proper PDF 1.3 version tag and no Metadata key.

If an input file is a PDF file and does not have the Title or Producer keys filled out, then the master file likewise does not have these keys filled out. On output, the Producer key is filled out, but the Title key is not.

What if I don't want to use the PDF/X feature in Prinergy?

If you don't want to use PDF/X format as your digital master file, simply configure your process template to generate PDF instead of PDF/X-1a:2001. Prinergy generates digital master files the way it always does. This allows the Prinergy functionality that is not possible with PDF/X.

What about PDF/X-3?

A PDF/X-3 file can contain Output Intents, which indicate the file's intended target device, including its color profile.

The system warns you if PDF/X-3 input files contain Output Intents and shows the value of the Output Intents in the history log. This happens automatically; you do not need to enable this feature.

If your input file is PDF/X-3, you can use the color profile specified in the PDF/X-3 Output Intents. Select the **Prefer embedded PDF/X-3 Output Intents for Final Output Profile** check box, which is located in the **ColorConvert** section of the refine process template.

If your output is PDF/X-3, you can specify an ICC profile or named print condition for the PDF/X-3 Output Intents in the **Output Intents** area of the **File Format** section of the output process template.

To check PDF/X-3 compliance and color accuracy of a workflow, refine and output the Altona Test Suite. See Using the Altona Test Suite 1.2 and Using the Altona Test Suite 2.0.

Where can I find more information about PDF/X?

- http://www.iso.org/—ISO-15930 description of the differences in technical requirements between PDF/X-1a:2001 and PDF/X-3:2003
- http://www.npes.org/programs/standardsworkroom/cgatstechnicalstandards.aspx—a link to CGATS (Committee for Graphic Arts Technologies Standards), the group writing the specification
- http://direct2.timeinc.com—Time Inc. recommendations on file submission