

A to X of PDF

Now that Adobe has set up the retirement plan for Postscript, it's clear that the already popular file format PDF will be the absolute number one file format for electronic file delivery in print publishing. Most printers already include a line in their estimates which states something along the lines: "This price assumes delivery of printable electronic files, preferably PDFs". But what exactly is a 'printable' PDF, really?

Originally the PDF format was developed by Adobe for exactly that reason – documents created in different software and on different operating systems should all be viewable and printable by the receiver. But in the beginning this was designed very much for 'office' use, and today a PDF can mean anything from a low resolution proofing PDF full of sticky notes and annotations, to a preflighted and validated high resolution PDF/X-3 file. The latter is printable, the former is most likely not, at least not with any quality.

The X-files

As PDF usage has become more common in the print industry, so there has been a need to define what a printable PDF file is. Industry organisations like DDAP (which has recently renamed itself the rather impenetrable Digital Directions in Applications for Production) and the NAA (Newspaper Association of America) recognised this problem early on. These organisations prompted CGATS (Committee for Graphic Arts Technical Standards) to develop in the late nineties the first suggested standard, the PDF/X-1 format. The 'X' stands for exchange, but there's nothing other than pure Adobe PDF-technology included in the file format.

For a file to be recognised as a PDF/X-1, the specification is mainly about what it should not contain. A PDF/X-1 file should not contain attachments or annotations, or images in RGB or CIE Lab. Curiously enough the PDF/X-1 format as such doesn't state anything about what resolution is requested – this has to be specified in some other way – typically via a preflight profile (often called a PDF profile).

The PDF/X-1 format quickly gained a *de facto* standard status, and in 2001 it was accepted as an ISO standard, number 15930-1. By that time it was revised, and was renamed PDF/X-1a. Two years later it was revised again, so to be exact you should include the year of revision when you state what type of PDF/X-file you mean, for example, PDF/X-1a (2003) version.

But this is just the beginning of the X-series. While PDF/X-1 gained momentum, with its fairly straightforward processing, containing only ▶

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▼ separated CMYK-images and spot colours, other sections of the graphic arts community wanted to work with RGB and CIE Lab images, and with OPI and DCS files. So, two other versions of PDF/X were prepared, the PDF/X-2 format accepting multi-channel DCS-files (Desktop Color Separations, originally a file format developed by Quark in 1989), and the PDF/X-3 format, accepting RGB and CIE Lab images (but not OPI or DCS files).

Of these two, the first to come into use was the PDF/X-3 format, and it became an ISO standard in 2003, number 15930-2. The PDF/X-3 format allows late binding in the document processing workflow, meaning you can hand over the colour separation process to the RIP, for it to be done at the last moment. To make this possible the images inside a PDF/X-3 file need to have ICC-profiles embedded, and the assumed output profiles need to be included in the PDF as well. Again, the requested image resolution is not stated as such in the PDF/X-3 specification, but can be specified using an appropriate preflight profile.

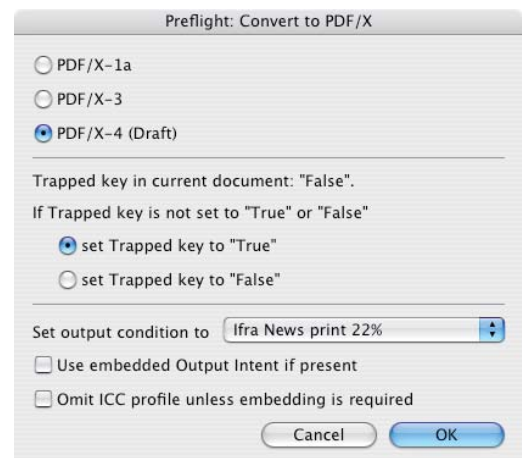
The PDF/X-2 format did achieve ISO status together with PDF/X-3 in 2003, but doesn't seem to have gained much momentum or use in the industry yet. This is a little strange, since it should be ideal for packaging production, where it's common to print with many more colours than just CMYK, and so the multicolour capacity of the DCS format should fit in well. Perhaps the file preparation of multi-colour print jobs is so advanced and complicated, that packaging printers prefer to be given native files from Illustrator, InDesign and QuarkXPress, instead of educating clients to learn about and use PDF/X-2.

Printable PDFs – The Ghent PDF Workgroup

When it comes to defining how to correctly preflight documents and create 100% printable PDF/X-files, there is one authority above any other to ask for directions. The GWG, or Ghent PDF Workgroup, has been frantically active since its start in 2002. All the vendors of preflight software and a lot of heavy duty users are members of the GWG and publish a series of preflight profiles for specific application areas.

Whatever preflight application you use, and type of workflow you have, you can be reasonably certain of finding a suitable and well tested preflight profile to download from the GWG website www.gwg.org. For many programs the preflight settings are often called PDF profiles, and specify among other things what resolution is needed for a certain type of print production.

Of late much of the work in the GWG has been focused on colour management in PDF files, so the GWG and the ICC are two important organisations to turn to as regards quality assurance. At the moment Quark is rolling out the new XPress 7.0, and Adobe has just released Acrobat 8.0,



Acrobat 8.0 includes an option to save files as PDF/X-4 files.

▼ so it might be a good idea to be on the lookout for suggested and approved GWG PDF profiles for those applications in the near future.

X marks the spot

Perhaps you find it confusing that there are different versions of PDF/X? Unfortunately it will get worse, in that today's PDF/X-series only supports PDF version 1.3 fully, although the 2003 revision supports PDF 1.4 to some extent (but unfortunately not layers and transparency). To put it simply, PDF version 1.3 supports approximately the same complexity in documents as Postscript 3, so advanced layer functions and transparency settings which are possible in PDF 1.4, through to the recently released 1.7, are not supported directly in a PostScript 3 RIP.

Instead, these files need to be flattened for correct processing. Native support for PDF 1.6 and 1.7 is only possible in RIPs using the new Adobe PDF Print Engine, or similar technology using direct PDF Library processing (as for example Artwork Systems, Esko-Graphics and Global Graphics do). So we won't see native support for PDF version 1.6 and 1.7 in a broad range of devices until later in 2007, and even then, we will need some sort of specification as to what makes these PDF files truly printable.

To this end, a new series of X-files is in preparation, starting with PDF/X-4. The new Acrobat 8.0 actually has a preflight setting for PDF/X-4, based on the draft version, for three types of printing conditions. But for now it's probably wise to stick to PDF/X-1 to 3, and wait for the approved PDF/X-4 version later in 2007.

As well as the X-series there is a standardised and ISO-approved PDF specification for archiving purposes, the PDF/A-series. It has quite a lot in common with the X-series, but is not intended to be a high end print format, being aimed instead at long term document archiving purposes. It is ISO number 19005 and was approved in 2005.

The main benefit of the PDF/A standard is that it guarantees and facilitates search functions, an improvement over a TIFF-based document format. The PDF/A format also supports information about the document structure as well as rich metadata. As with any PDF-file it's possible to compress the data quite substantially without any visual loss.

So even if the different PDF-flavours tend to look like a jungle at a quick glance, there is definitely a logic to it. The alternative, ignoring the X-files, is worse than learning more about them. Ignoring the PDF/X-standard means you will lose much of the ability to control quality, instead allowing more or less any type of PDF-file to pass through your workflow, printable or not.

– Paul Lindström



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