

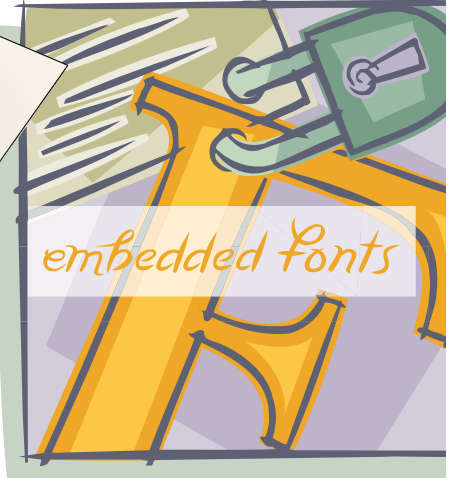
AN
INTRODUCTION
TO



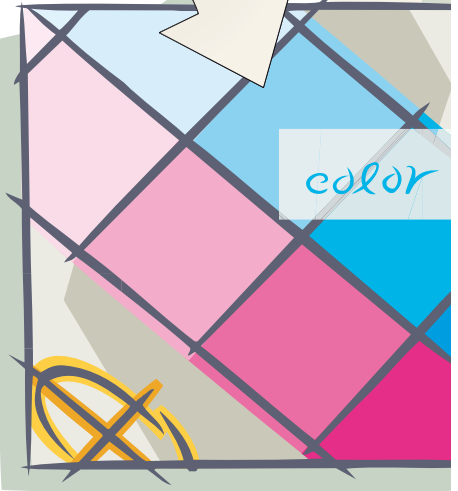
PDF
and PDF/X



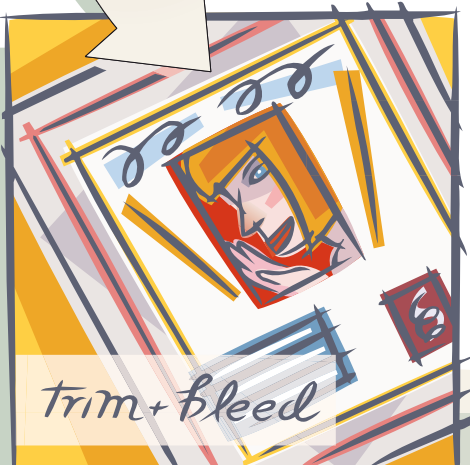
trapping



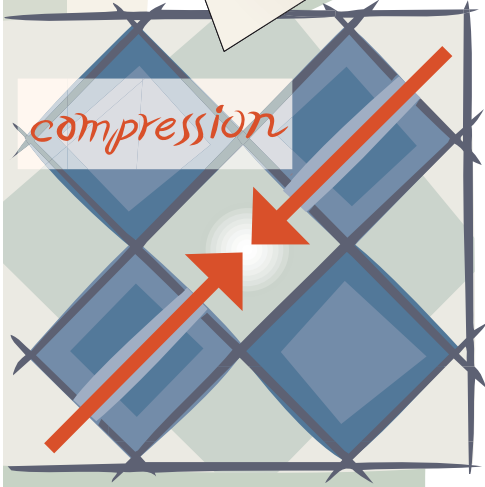
embedded fonts



color



trim + bleed



compression

AGFA 

By now, Apple Macintosh computers and PostScript-based applications have largely replaced typesetters and CEPS in the creation of advertising materials.

While the new tools give creative directors more freedom and control over their projects, we are now at a crossroads. Wide acceptance of CTP (computer-to-plate) by magazine printers is accelerating the need to implement a totally digital workflow. Besides producing significantly better quality, CTP reduces cycle time. Of course, printers want to utilize these new systems with all their customers' jobs. This requires that all files be delivered digitally, rather than as film separations.

In the past few years, TIFF/IT-P1 has gained popularity as a means of exchanging digital advertising materials. This raster-based file format provides the security of film while enabling both the file transfer and digital platesetting steps to occur seamlessly. However, TIFF/IT-P1 has several drawbacks, including inability to represent the intended screening type, screen angles or object-by-object screening angles. Further, this format suffers from unnecessarily large file sizes and lack of last-minute editability.

PDF has matured. The newest release of Acrobat 4.0 generates PDF 1.3 files with features that make it suitable for advertising, including the ability to embed *all* fonts, the ability to represent trim *and* bleed with sufficient accuracy, better annotation tools, lossless compression, the ability to embed information about whether a PDF file is trapped or not, and a way to insert information about the intended printing condition using ICC profiles. PDF/X is a variant of PDF 1.3 intended for high-end printing.

Comparative Chart of Current Delivery Options/Methods

This chart compares the relevant features of various file formats that can be used for digital delivery.	PDF		TIFF/IT-P1
	PDF/X	PDF	
<p>PDF is a cross platform file format that can contain fonts, searchable text, resolution independent vector graphics, raster and bitmap images that can be exchanged, edited and viewed with a free viewer application.</p> <p>TIFF/IT (Tagged Image File Format/Interchange Technology) enables parties to exchange high resolution raster data in a standard transport media independent way.</p>			
Capabilities			
Composite	●	●	●
Separations	●	●	×
Editable	●	●	limited
Searchable	●	●	×
Preflightable	●	●	×
Trim, bleed features?	●	×	●
Imposition	●	×	●
Web viewability	●	●	×
File stability	●	●	●
Lockability, access	●	●	×
Accredited	●	×	●
Font stability (reflow/substitution)	excellent	good	n/a
Requirements			
Additional application for viewing?	×	×	●
Licensing not required	×	×	×
Size			
In relative megabytes	1.7 MB ¹	164 KB ²	30.7 MB
Cost			
\$\$\$\$	\$250	\$250	\$10,000 - \$20,000

¹ Print optimized
² Screen optimized

EPS			PostScript		Native Files		CopyDot	
Encapsulated PostScript (EPS) This file format was created to enable file exchange in the PostScript world. It supports composite and separated workflows for both vector graphics and bitmap images, as well as clipping paths, but requires all fonts to be embedded.			PostScript is a device independent programming language that is normally generated by the user when they print a document. PostScript files can describe text vector graphics and raster image for a specific device.		Native files such as XPress, Illustrator, and Photoshop are required to create ads, but are not well suited to file exchange because of platform and revision compatibility issues. Most support both RGB and CMYK/separated workflows.		CopyDot normally refers to TIFF files that have been created when 4-color screened film has been scanned at very high resolution. The file is a digital replica of the original film and is normally scanned at the specific resolution that the final platesetter supports.	
EPS	DCS 1	DCS 2	Composite	Separate	Composite	Separate	TIFF	DCS ⁴
●	×	×	●	×	●	●	×	×
●	●	●	×	●	●	●	●	●
×	×	×	×	×	●	×	limited	limited
×	×	×	×	×	●	×	×	×
limited	×	×	limited	limited	●	●	×	×
×	×	×	×	×	×	×	×	
●	●	●	●	●	limited	n/a	limited	●
×	×	×	×	×	×	×	×	×
×	limited	limited	×	×	×	×	●	●
×	×	×	×	×	×	×	×	×
×	×	×	×	×	×	×	●	×
×	×	×	×	×	×	×	n/a	n/a
●	●	●	●	●	●	●	●	●
×	×	×	×	×	●	●	×	×
26 MB	26 MB	26 MB	72 MB	72 MB	17 MB	17 MB	43 MB	6 MB
\$ 800	\$ 800	\$ 800	\$800-13,000	\$800-13,000	\$ 800	\$ 800	\$30,000-300,000	\$30,000-300,000

³ Many application vendors permit the use of de facto approaches, such as letting objects fall outside the bounding box, or proprietary bounding boxes to "enable" bleed and trim to be determined.

⁴ With compression

How the PDF/X workflow differs from PDF

PDF workflow



Document designer
The designer creates a document in his or her preferred authoring application.



Original Authoring Application File



Create PostScript file
Using the appropriate Printer Drivers and PPD files, one prints to disk taking care to set up the applications page set up and print dialog boxes properly.



Export to PDF/X
Extensions & Plug-ins will be able to export files directly to PDF/X.



Digital Proofer
A proof for review is made from the PDF file.



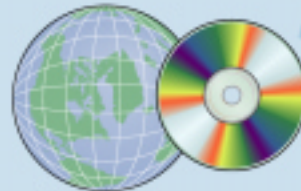
Final output
Screened bitmap data is sent to the specified output device, such as a CTP system, an imagesetter, or to a digital press.



RIP
A RIP is required to render the PDF/X file for the specific output device conditions, including resolution and screening. The RIP will also execute trapping and color separations according to the instructions in the PDF/X.



PDF/X
Once exported, the file should be analyzed to verify that it conforms to the PDF/X specification, a process that will be repeated by the receiver/printer.



Digital Distribution
PDF files can be delivered on disk, via e-mail, or viewed in a browser on the Internet.

PDF/X workflow



Acrobat™

Acrobat lets you modify and merge PDF documents, adding features such as password protection, annotations, links and bookmarks, thumbnails, movies and sound, and interactive forms. You can also use Exchange for simple text editing, and for correction of captured (scanned) files.



Client comments

Clients can add review comments on a separate layer in a PDF document.

In Acrobat Distiller output settings can be specified.

Use "Screen Optimized" settings early in the design cycle to reduce file size and speed up viewing on-screen or on-line. Use "Press Optimized" settings when preparing PDF files use in a high-end publishing or printing environment.



Acrobat™

Acrobat Plug-Ins enable you to make extensive changes and add certain things like trapping information, trim and bleed, and password protection to secure a document.



OPI, database server and archiver

Images are replaced and/or custom data is entered in specified text fields.



Prepress Options

Defining the condition of trapping and embedding printing type information must be specified to conform to the PDF/X specification.



Preflight

A PDF/X file is transferred to the output service provider where a report can be generated listing all of the document components, including fonts, images and graphics.

PDF has always been one of the most graphically rich, flexible and reliable file formats to represent and exchange a design digitally. It is so flexible, that many things can be represented and exchanged inside them, including sounds, movies, links to web sites—even information that can be viewed but isn't intended to be printable, or (in the case where a color is specified as RGB) may not be suitable for certain print production environments. This is one of the important reasons that the PDF/X file specification is being developed.

PDF/X—the X stands for eXchange—is a proposed ANSI standard being developed by CGATS, and it will most likely become an ISO standard, just as TIFF/IT did. Technically, it is a subset of Adobe's PDF 1.3 specification that is solely intended for prepress production. PDF/X covers composite files containing both vector and raster objects.

Two PDF/X specifications are being developed. A PDF/X-1 file can be output directly by the printer to facilitate "blind" transfers from publishers. A PDF/X-2 file requires modification, such as OPI image replacement prior to final output.

Given advertisers' demands to reduce cost and turnaround time, combined with the widespread implementation of CTP, digital workflows must replace film-based workflows. Although TIFF/IT is a viable method for achieving this, PDF/X is recognized as the next evolutionary step of the standard. In fact, one can embed a TIFF/IT file within a PDF file, though this does not guarantee PDF/X conformance. The PDF/X specification offers a more efficient and flexible means of making sure the production cycle—from creative through the printing press—satisfies the client.

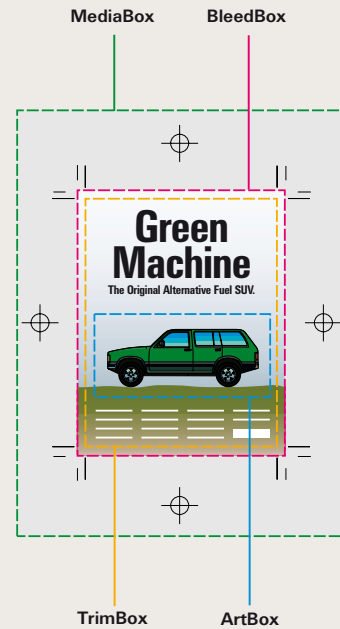
Once PDF/X is finalized, suppliers will develop tools that generate and consume files that “conform” to this specification. Here are some general guidelines that will facilitate your understanding of PDF/X. As with existing workflows, the PostScript file will determine the reliability and quality of the resultant PDF. For a PDF file to conform to the PDF/X specification, certain conditions are required, prohibited or restricted. If it doesn’t meet these conditions, the “reader” will “fail” the PDF file. Many vendors are developing PDF/X “writers” and tools that will enable one to add certain things that are missing—like bleed and trim or embed fonts, for example. Besides including all objects needed for printing, a PDF/X-1 can also contain preview files, annotations, and other non-print data that may be useful to the receiver.

Trim and Bleed

For a file to conform to PDF/X, the PostScript either needs to represent trim and bleed so it will be then processed and embedded by Adobe Acrobat Distiller or added to a PDF using a Plug-in or a PDF editing application. This information must be present to enable files to be imposed by applications, and is also essential for authoring applications that may need to place a PDF within another design. An example would be placing a partial ad into a magazine page. Certain additional objects may be required outside the trim area to facilitate film output for manual stripping, where certain marks are required to position the film properly. To comply with the PDF/X-1 specification, the file must include a MediaBox and an ArtBox; if a BleedBox is defined, then the ArtBox must not extend beyond its boundaries.

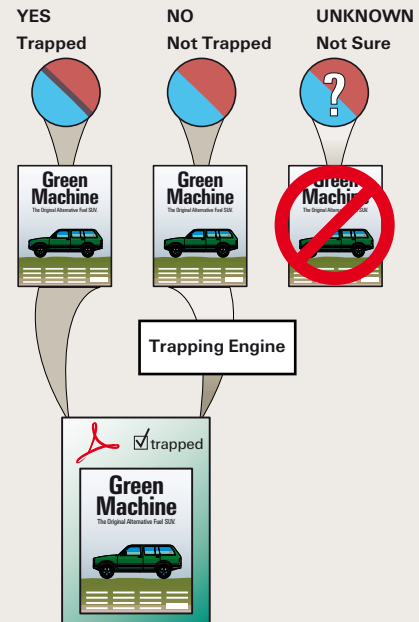
Trim & Bleed

There are four important “box” definitions. The MediaBox defines the entire imageable area of a design, including folding/cutting/ finishing marks. The BleedBox defines the design so that it satisfies imposition requirements and includes the full bleed area. The TrimBox defines the finished design once the bled objects (color bars, crop marks) are “trimmed” away. Finally, the ArtBox may define the location of individual elements within the TrimBox, and may sometimes serve a role similar to a clipping path.

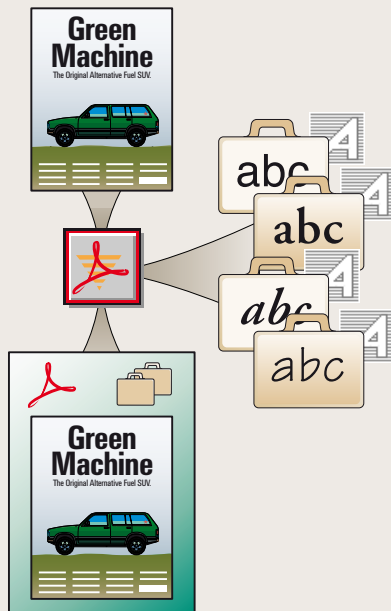


Trapping

Trapping is understood as the process of adding marks to a file along the border of adjacent color areas which prevent unsightly gaps between color in the instance where misregistration occurs on press. To prevent this from occurring, small marks can be introduced between each of the adjacent color that contain each of the adjacent colors. The trapping tag simply indicates if this process has been done or not.



Fonts



When you create a PostScript file for distilling, it is essential to include all fonts to ensure that the fonts are available for viewing and printing. To guarantee reliability for high-resolution printing, many service providers may choose to convert TrueType fonts to Type 1. Many sites may not have printing devices or post-processing applications that contain True-Type rasterizer, which are necessary to avoid printing to the default font, such as Courier.

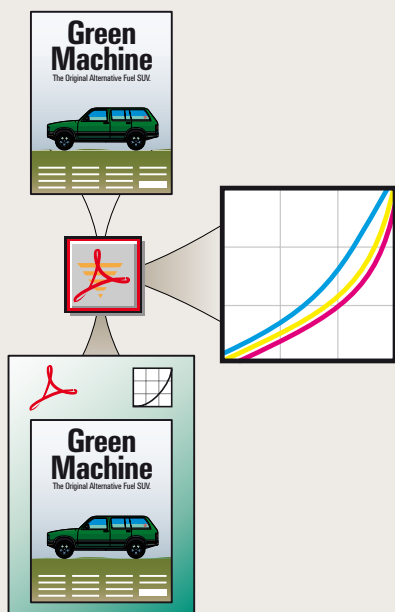
Trapping

Either the entire file has been trapped or left untrapped. No partial trapping is permitted, nor can this value be left as “unknown,” as is permitted with a “generic” PDF. To conform to the PDF/X-1 specification, the trapping value of True or False must be present in the header file so the receiver “knows” how to process it. Moreover, any objects that are going to overprint must conform to the existing PostScript Level 2 specification.

Fonts

All of the glyphs, fonts, font metrics, and encodings must be embedded. By definition, these will be used by the receiver when outputting the file. Unlike popular workflows in which the receiver’s system may use its own system fonts unless instructed otherwise, the PDF/X specification ensures that the type outputs exactly as intended.

Color



It is very important that all the images inside a single PDF/X file have all images and elements are properly prepared for a single printing condition, such as SWOP. The way this information is communicated is by preserving or adding an ICC profile that defines what printing condition was intended.

Color

In order to help facilitate two parties to communicate color information without a physical proof, certain things must be included inside the file that describes the sender’s printing “intention.” Therefore, in order to conform to the PDF/X specification, all print elements must be exchanged as CMYK data, Grayscale or Separation color data with ICC-based profiles embedded in them. All color corrections must be performed prior to PDF/X creation and must be targeted to a single printing condition such as SWOP which is formally described in ANSI/CGATS.6-1995 and whose color characterization (suitable for ICC profile creation) is documented in ANSI/CGATS TR001.

Compression

Data compression is not required for PDF/X, but lossless data compression is suggested and JPEG image compression is allowed.

Credits

Technical Direction and Concept:

Michael Jahn, *Agfa*

Creative Direction:

Maria Giudice
HOT, San Francisco, CA

Art Direction & Design:

Hyland Baron
HOT, San Francisco, CA

Writing:

Alex Hamilton
Computers & Communications Consulting Inc.
Philadelphia, PA

Cover Illustration:

Bud Peen
Oakland, CA

Interior Illustration:

Steve McGuire
Martinez, CA

This document is a preview of a future publication—the newest in Agfa's award-winning educational series. The full edition of *An Introduction to PDF and PDF/X* will be forthcoming. To obtain more information, please contact us at the numbers below, or see our Web site. In addition, more than 15 other educational and reference publications and CDs are available from Agfa. These materials provide clear, concise and objective explanations of complex prepress, imaging and printing topics. Call for a free catalog.



Agfa Educational Publishing
P.O. Box 787
Randolph, MA 02368-0797 USA

Toll-free: 1-800-395-7007

Phone: 1-781-341-2255

Fax: 1-781-341-6261

www.agfahome.com/publications

Copyright 1999 by Agfa Corporation. All rights reserved.