

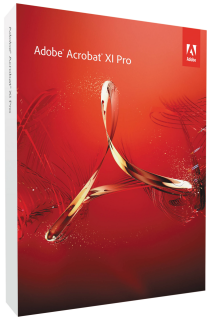
# week::nine

## Portable Document Format (PDF)

### A Brief History of PDFs

#### In the Beginning...

- John Warnock, founder of Adobe and co-creator of PostScript, early on had a vision of a paperless office.
  - This vision even dates back to Xerox PARC and the computer systems that inspired Steve Jobs and his Macintosh project.
  - *“Imagine being able to send full text and graphics documents (newspapers, magazine articles, technical manuals etc.) over electronic mail distribution networks. These documents could be viewed on any machine and any selected document could be printed locally. This capability would truly change the way information is managed.” — John Warnock*
- Worked to develop a version of PostScript that could be viewed easily on-screen and be portable across computing environments.
  - Project codename was Camelot; initial name at time of release was Carousel.
- The result was the **Portable Document Format**—aka the PDF.
  - PDF is heavily based on PostScript.
  - macOS’ imaging model (both for on-screen graphics and printing) has deep roots in PDF.
- Initial reception was tepid as Adobe priced the product somewhat high, both for creating PDFs and *reading* PDFs.
  - After a few years they realized they needed to distribute the reader for free (Adobe Acrobat Reader) and charge for software that created PDFs.
  - With PDF as a basis of macOS, creating PDFs from any program on that operating system became trivial and, most importantly, free.
- Beginning in 2006, Adobe released an open specification for PDF, allowing any software developer to write applications that both read and create PDFs.
- In-depth history: <https://www.prepressure.com/pdf/basics/history>



#### Simplified Version History

Year Released	PDF Version	Acrobat Version
1993	PDF 1.0	Acrobat 1.0
1999	PDF 1.3	Acrobat 4.0
2001	<b>PDF/X-1a 2001</b> <b>PDF 1.4</b> (Transparency support introduced)	Acrobat 5.0
2003	PDF 1.5	Acrobat 6.0
2005	PDF 1.6	Acrobat 7.0
2006	<b>PDF 1.7</b> (is basis for the ISO 32000 spec)	Acrobat 8.0
2008	ISO 32000, Adobe BaseVersion 1.7 and ExtensionLevel 3	Acrobat 9.0+
2017	PDF 2.0 (ISO 32000-2)	
2020	ISO 32000-2:2020	

## Primary Features

### Platform-independent

- Can be viewed on any platform that supports the free Adobe Reader.
- Document appears the same across platforms

### Self-contained

- All document components are contained in a single file, including fonts, linked graphics and text, and layout information.
- Combines vector, raster, and text into a single document

### Viewing PDFs is free

**Can be created from almost any application** (via the Print dialog box on the Mac, for example).

### Is becoming the standard for placement into other applications

- Many prepress houses have gone to a PDF-based workflow.

**Excellent as an archival format—should be viewable for decades to come.**



## Other Features and Drawbacks

### Secondary Features

- Professional version supports editing and extensive pre-flighting tools.
- Excellent for presentations, including support for full-screen viewing.
- Supports internal bookmarks and external hyperlinks.
- Can be password protected and set to not be printable and non-editable.
- Supports commenting and annotations using Acrobat Pro DC.
- Support forms and form data submission.
- Includes excellent apps on mobile devices

### Drawbacks

- Once in PDF format, can be very difficult to edit.
- Not supported in older applications or workflows.
- Good PDF creation software on Windows costs money.

## Creating PDFs

### Direct from Adobe Creative Cloud applications

- Though the PDF feature is accessed in different ways, all of the Adobe applications share a common set of PDF presets.
- PDFs created directly from Adobe apps are very high quality.
- Methods:
  - Photoshop > Save As... > Photoshop PDF
  - Illustrator > Save As... > Illustrator PDF
  - InDesign > Export > PDF

### Direct using Acrobat Pro

- Acrobat Pro > File > Create PDF... > *method*
- Methods of note:
  - *From Multiple Files...*: Select one or more files from the Finder and merge them into a PDF.
  - *From Web Page...*: Enter a URL and have Acrobat crawl the entire site, creating a PDF version of it.

**Print using the macOS’ built-in *Save as PDF* or *Preview* application**

- o Good for basic creation of PDF from programs like Word, Safari or other non-print production programs.

**Acrobat Distiller**

- o An application whose sole job is to turn PostScript files into PDFs.
- o Creates PDFs of the highest quality—an excellent proofing and print debugging tool.
- o Must use a computer’s *Print to PostScript* feature (or Adobe’s PostScript File option) to generate a .ps file that can be fed to Distiller.

**PDF Creation Options from InDesign**

- o Settings and options of note from the InDesign Export PDF dialog box.

**Presets, Standard & Compatibility**

- o Presets: Take special note of the color conversion defaults.

<b>High Quality Print</b>	Best for laser or ink jet printing. <b>Does <i>not</i> convert images to a different color space.</b>
<b>Press Quality</b>	Use to create PDFs suitable for commercial printing. <b>Images are converted to CMYK.</b>
<b>Smallest File Size</b>	Used for posting onto the Internet. <b>Converts images into the sRGB color space.</b>
<b>PDF/X-1a:2001</b>	Creates a PDF that conforms to the stricter requirements of commercial prepress. <b>Requires CMYK conversion of images.</b>

- o *Standard* option
  - Allows you to select a PDF/X standard to save to—best to ignore it and use the Preset options instead—Ask your service provided which one they support.
- o *Compatibility* option
  - Allows you to save to a previous version of the PDF specification.
  - In general, *Acrobat 5.0/1.4* is the safest version. Prior versions do not support transparency.

**General**

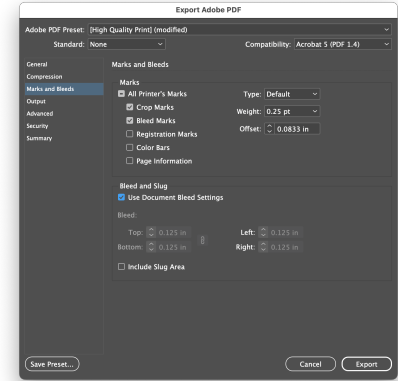
- o In addition to **page range**, you can print the document as **spreads**.
- o Only use the **Optimize for Fast Web View** when saving a PDF for posting on the Web.
- o Check the **Visible Guides and Grids** option to includes these items in the PDF. They don’t really help in printing, but they can be good visual aids when teaching about InDesign.

**Compression**

- o Gives you direct control over the quality of your raster artwork.
- o The **Down-sampling** options help in removing unneeded and potentially disk-space hogging raster information.
  - Follows the rule of using no more that 2X the line screen of your output device.
  - This is why the default for Press Quality down-samples images to 300ppi.
- o When saving **PDFs for print**:
  - Set the Compression to either ZIP or JPEG at Maximum image quality.
- o When saving **PDFs for the Web**:
  - Set the Compression to JPEG at between High-to-Low quality level.
  - Experiment with the different settings, seeing which is the best trade-off between quality and file size.
  - The low-quality settings often produce unacceptable images, even for onscreen viewing.
  - I usually like to use a higher ppi rating for the Web than the default. 100ppi to 150ppi can make for a good viewing experience, especially when the viewer (or client) zooms in for a closer look.

**Marks and Bleeds**

- Include the **Printer’s Marks** in your PDF only if requested by the print service provider, or if you are producing it yourself and require these marks for finishing.
- If the intent of the PDF is for printing and bleed is used in the document, be sure to select Use Document Bleed Settings. Otherwise the PDF will be created without bleed, including online artwork within the trim size.



**Output**

- Under **Color > Color Conversion**, gives you control over how (and if) the images in your document are converted to a different color space.
  - When working with the Press Quality preset, InDesign will convert all colors and images into CMYK.
  - When working with the Lowest File Size preset, InDesign will convert all color and images into the sRGB color space.
- The **Color options**:
  - *No Color Conversion*: Artwork is left alone and is not changed at all.
  - *Convert to Destination*: Color and images are converted to the destination color profile listed in the Destination field below.
  - *Convert to Destination (Preserve Numbers)*: Same as Convert to Destination, but any CMYK color builds are left alone. Generally, this is the preferred setting.
- You can manage your inks here as well using the **Ink Manager...**

**Advanced**

- The Fonts option on this tab asks you when Acrobat should embed a **subset of a font** instead of embedding the entire font.
  - At a setting of 100%, only the characters that are used in a font are included in a PDF. In theory, this saves on disk space.
  - At a setting of 0%, **ALL** characters in a font are embedded, potentially making editing easier at some point in the future.
- Remember that not all fonts can be embedded in a PDF document.

**Security**

- Enable password protection on your document.
- Restrictions can include:
  - Opening of document
  - Printing of document (low or high resolution)

**Acrobat Product Line**

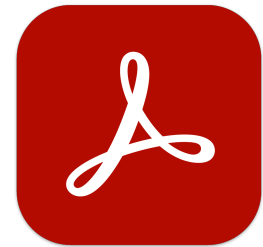
**Many options; Only one that applies to print professionals**

<b>Acrobat Pro</b>	Flagship product of the Acrobat family. Create PDFs, includes Distiller, extensive Preflighting and repair tools, document security. Is the only choice for print professionals.
<b>Acrobat Standard</b>	General purposes PDF creation. Lacks print preflighting and repair tools. Does include Distiller. Windows and corporate only
<b>Adobe Reader</b>	Free viewer for PDF documents. Also allows for the completion of forms, commenting, and printing. Available on almost any platform, including mobile and tablets.

## Key Acrobat Applications

### Acrobat Pro

- Document Properties (File > Properties; Command-D)
- Print tools (Tools > Print Production > *tools...*)
- Extracting Artwork
  - Acrobat can be used to extract raster and vector files from PDF files.
  - Use View > Tools > Edit PDF, then select the Selection arrow tool. Select an image, and right-click on it, selecting Edit Using... to extract the image.



### Acrobat Distiller

- Drag-and-drop conversion of PostScript files
- Job Options & Watched Folders

## Understanding PDF/X

### Defined

- A restricted subset of Adobe's PDF specification created for high-resolution print output and file exchange.
- To increase reliability of the PDF, PDF/X excludes things like JavaScript Actions, annotations, audio annotations, multimedia files, hyperlinks and other non-print components.
- It has become a standard for ad artwork submission for magazines and newspapers.
  - For example, Time Inc.'s 56 magazine titles reportedly account for about 25 percent of all magazine ads, and the company mandated in 2002 that all their advertisements be submitted as PDF/X files and announced they would send only PDF/X files to their printers.  
(Source: <http://www.pdfzone.com/c/a/Document-Management/PDFX-A-Primer/>)
- PDF/X files, in theory, should be much more reliable than general PDF files, since they include far less (unnecessary) information.

### Features of PDF/X-1a:2001

- Is based on the PDF 1.3 file specification, so **no transparency**.
- All fonts must be embedded in the file.
- All color data must be grayscale, CMYK, or named Spot colors.
  - The file should not contain any RGB or LAB data.
- Compliant files cannot contain music, movies or non-printable annotations.
- If there are annotations (sticky notes) in the PDF, they should be located outside the bleed area.
- The file should not contain forms or JavaScript code.
- Only a limited number of compression algorithms are supported.
- Encryption cannot be used.  
(Source: <http://www.prepressure.com/pdf/basics/pdfx-1a>)

### Versions

- **PDF/X-1a:2001** is the primary version in use today. They use the PDF 1.3 file specification.
- **PDF/X-3:2002** includes the ability to use RGB and LAB images in a color managed workflow.
- **PDF/X-4:2008** updated v3 to include support for live, un-flattened transparency.
- **PDF/X-5** updated v4 to include support for external images.

### When to use

- To troubleshoot a file that is having difficulty printing.
- When asked to by a print provider or publisher.
- When sending artwork to a printer whose color and digital workflow is known to you.

## Other Variations

### PDF/A

- A version that is used in long-term archiving of documents.
- Forbids some features that are ill-suited for long-term storage
  - For example, copyrighted algorithms, JavaScript, encryption, or linked fonts.

### PDF/E

- A version that is used for engineering documents.

### PDF/VT

- An international standard for variable data (“variable transaction”) printing.

## Tips for Printing from Adobe Acrobat

### Basics

- In addition to printing documents in a standard format, Acrobat supports automatic **poster** printing, **multiple-up**, and **basic booklet** printing.
- Supports sending just grayscale (black and white) data to the printer.

### Advanced Options

- Located under the *Advanced* button next to the printer selection dropdown.
- Included many powerful options, including:

### Print as Image

- Useful to troubleshooting documents that won't print.
- Rasterizes the entire document (flattening and simplifying it) before sending it to the printer.
- Setting is sticky, so de-select it after use.

### Output > Color

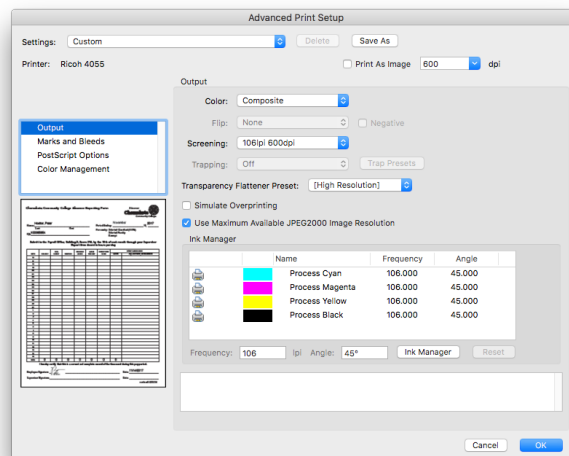
- Control what overall color information is sent to the printer, including the ability to send separations.

### Marks and Bleeds

- Add trim, bleed and other color marks to a print.
- Only works if the document size is set to the trim size.

### Color Management

- Advanced control of how vector and raster color is sent to the printer.
- Example Dialog Box:



## Common PDF Errors or Mistakes

- *From PrePressure, a blog about printing.*
- *Direct source: <https://www.prepressure.com/pdf/pdf-troubleshooter>*

### Introduction

- PDF files are used to send print-ready data to printers. The file format is also frequently used for submitting adverts to publishers or as a graphic file format for logos and drawings. Even though the file format itself is reliable, PDF files can still be troublesome.
- In 2017 GWG, a graphic arts association, ran a survey regarding the use of PDF files in the graphic arts industry. Below are the main issues reported by the 1,100 respondents. I've included how many people reported seeing each issue.

### The resolution of images is too low (70+%)

- Low image resolution leads to a loss of sharpness. When the resolution is really low images get a blocky or 'pixelated' look and straight lines that are not perfectly horizontal or vertical will show a staircasing effect.

### Use of incorrect or unwanted color spaces (50+%)

- Many printers request CMYK files so any PDF file containing RGB or Lab data will be incorrect, even though modern workflow systems and RIPs are perfectly capable of properly processing such color spaces.

### Bleed is missing (50+%)

- Unless this is corrected a thin white line may appear between the paper edge and close by images or tinted areas.

### Fonts are not embedded in the PDF (40+%)

- This can lead to text getting printed with a wrong typeface. It can also cause the spacing of characters to be completely wrong, with characters partially overlapping each other while others have too much spacing in-between them.

### There are problems with transparency (30+%)

### The PDF file contains an incorrect number of spot colors (30+%)

- Typically, printers who ask for pure CMYK files get PDF files with spot colors in them. When spot colors are expected, the same color might appear twice or more, each time with a different name.

### There is an issue with overprint (30%)

- The inappropriate use of overprint is an issue by itself. In this particular case, we're talking about there being a difference between the Adobe Acrobat preview (with overprint set to be honored) and the printed result. Issues with overprint can cause page elements to disappear or change color. Small text can become difficult or impossible to read.

### Total ink coverage is too high (30%)

- This can cause issues on press because the ink can't dry properly. This can lead to set-off where the ink of a still wet area rubs off on whatever is stacked on top of it. Too much ink can also lead to muddy browns in neutral areas.

### Incorrect ICC profiles are used (30%)

- The use of incorrect profiles may lead to the colors of the printed result also being incorrect.

**The dimensions of the PDF do not match the requested size (30%)**

- The PDF file format uses so-called page boxes to define page dimensions and bleed. These boxes are used to check if the PDF page size is correct, which sometimes is not the case. A typical example is a business card measuring 85×55 mm positioned in the center of an A4-size page. Obviously, the worst problem to receiving a PDF file that has a different aspect ratio.

**There are issues with flattened transparency (30%)**

- Flattening can cause thin white lines to appear. It can cause shifts in color or make text appear fat. Flattening can also cause white rectangles to appear in graphic elements such as artwork or images.

**Colors are not reproduced correctly (20+%)****The output intent is missing or wrong (20+%)**

- A typical example is the use of a US-specific output intent such as SWOP for files printed in Europe. This can lead to incorrect color separations

**The conversion of spot colors to CMYK differs from the expected result (20+%)****Technical elements are not defined properly (20+%)**

- A document may need to contain data for die cutting, embossing, spot varnishing or some other type of embellishment. A die line should, for example, be defined as a spot color named “die line” and set to overprint. If that is not the case, an operator needs to fix this manually or a new PDF file must be requested.