flush left

PDFs for Commercial Digital Printing

PDF stands for Portable Document Format. The goal of using a PDF is to produce a facsimile of your document that is device independent: that is, it can be opened without having Word for a Word file, or a specific printer if you print out the document. PDF is the file extension (myfile.pdf). Originally this was an Adobe creation, and the program was Acrobat—Acrobat Reader is the free Adobe PDF reader, Acrobat Pro or Standard are the Acrobat stand-alone programs used to create PDFs. However, in 2008 Adobe issued a public patent licences—royalty free—for Acrobat patents, to encourage reliance on PDF technology and standards.

There are now many companies that provide free and low cost PDF conversion programs. Most of these programs do not adhere strictly to Acrobat's standards, several of which are now ISO standards, for example PDF/X (used for graphics exchange, developed for commercial printing), and PDF/ A (developed for archival purposes).

Most commercial digital printers print from PDFs.; and most of them specify PDF/X-1a.

PDF conversion programs (including Acrobat, which can be accessed as a printer) install as virtual printers. To create a PDF, *File* > *Print* > *Select the printer* then select the PDF conversion program from your available printers. Do not click <Print>. Depending on your system or applications, you may have to click <Set up> or <Options>, you are looking for a button that says <Preferences> or <Options>. Sometimes the settings are immediately available, sometimes you have to find <Advanced>[1] (not all conversion programs have all these options):

14/26 Times Justified

- **Paper/trim/output size**—most of these programs default to 8.5 x 11. If your document is different from that you must check that the PDF size is set correctly.
    - In Reader: mouse over lower left corner or *File* > *Properties* > *Description* to see the actual size of the PDF pages.
- **Downsizing**—also called downsampling. Most programs permit downsizing (e.g. 300 ppi > 200 ppi[2]). Do not downsize unless you know you need it. Most programs default to either 300 ppi or downsizing is deselected/grayed out.
    - Without Acrobat or some other premium conversion program, you cannot tell the image resolution of images inside a PDF.
- **Compression**—Most programs permit adjusting compression.[3] For printing, 85% to 100% image quality, Adobe uses a 1-12 scale, with Maximum quality being 10-12.
    - There is no way to know if an image has been overly compressed by any number or test. Viewing it or printing it may show compression problems.
- **Font embedding**—you want to embed (fully or subset) the fonts you use in your document. The alternative is that system fonts are substituted. Some programs call embedded fonts softfonts,

1 See notes at end for more detailed information.

2 PPI/DPI: many graphics programs use ppi (pixels per inch); however commonly people say dpi (dots per inch) for the units of measure for image resolution, although it is incorrect. If you printed one pixel (the smallest single element of a rasterized image) at 300 ppi on the Canon Pixma desktop inkjet printer, it would require 1,024 tiny drops of ink, because the Pixma prints at printing resolutionof 9,600 dpi. I continue to make the distinction not because it technically correct, but because understanding the difference between actual dots of ink and pixels is important.

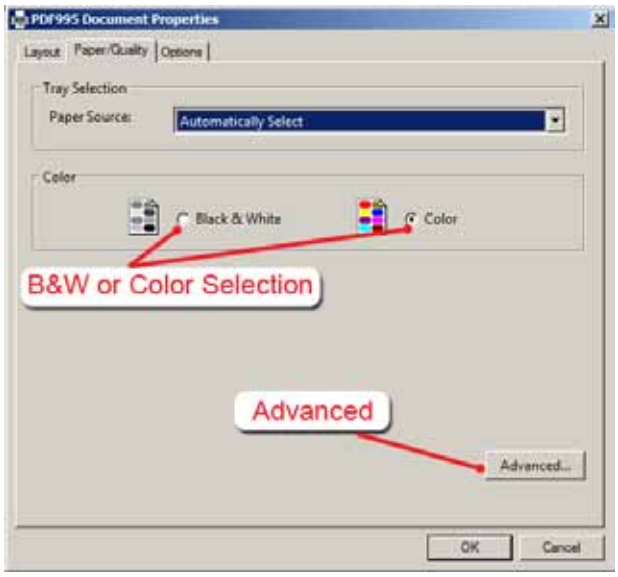
3 Compression: quality and file size (compression) are inversely related. If you want maximum quality, the amount of compression will be relatively small. If you want the smallest possible file size, the quality will be very poor.

10/12 Times Justified

ctr

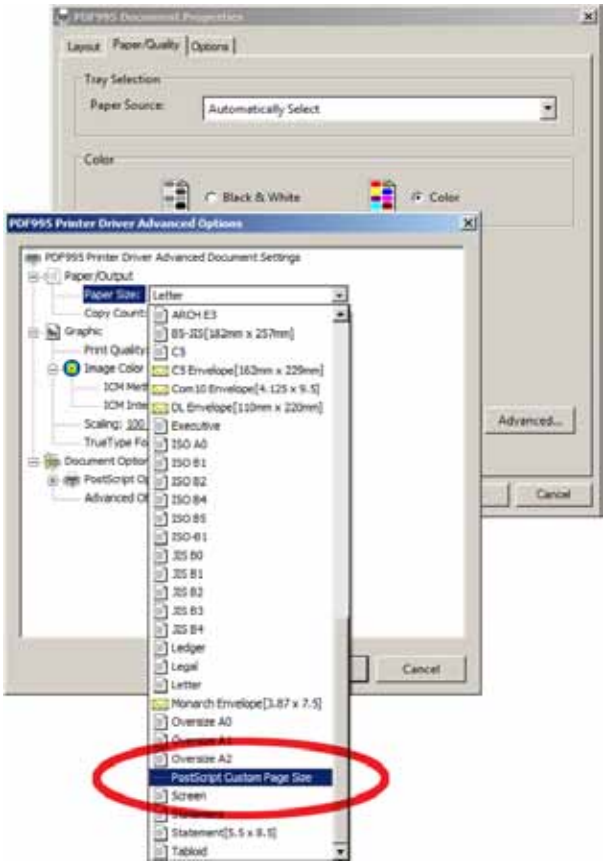
and will let you select "Download as softfonts." Do not use, "Substitute with device fonts."
    - In Reader, go to *File* > *Properties* > *Fonts* to see if the fonts are embedded or not. If the fonts are listed but do not say "Embedded" (complete or subset), they have not been embedded.
    - If you create a PDF with a font that is not embedded, the PDF will look okay on your computer because Reader will use the font on your computer. But on a different computer that does not have those fonts, substitute fonts will be used and the formatting will change.
- **Transparency**—ideally you want to remove transparency before commercial printing because you will see any color shifts, and there is less likelihood of problems. This may not be an available option (e.g. PDF/A and PDF/X remove transparency; PDF 1.3 compatibility does too).
    - Transparency (drop shadows, vignettes, blending modes, objects on a transparent background, translucent objects, etc.) must be removed (flattened) by the printer prior to printing. This often results in shifts in color. JPGs do not support transparency, but PNGs, TIFFs, GIFs, etc., do. Multilayered files have transparency.
    - PNG files with transparency (clear backgrounds, drop shadows, vignetting, etc.) do not always work—especially in Word. Tiff files with transparency or JPGs (with the transparency flattened/removed) generally are not a problem.
    - Without a program like Acrobat Pro, you cannot determine if the PDF has transparency.
- **Output resolution**—this sets the resolution of the ouput (printer, etc.) device.[4] Most commercial digital presses use 2400 dpi, often referred to as addressable resolution; laserjets are typically 300 to 600 dpi, a new inkjet printer could be 4800 x 1200. The higher the number the sharper and clearer the image. Check with your printer. Note: this does not convert your images to that resolution.

In non-Adobe products, select the PDF virtual printer, and click on Preferences or Printer Properties. This will bring up a properties screen:

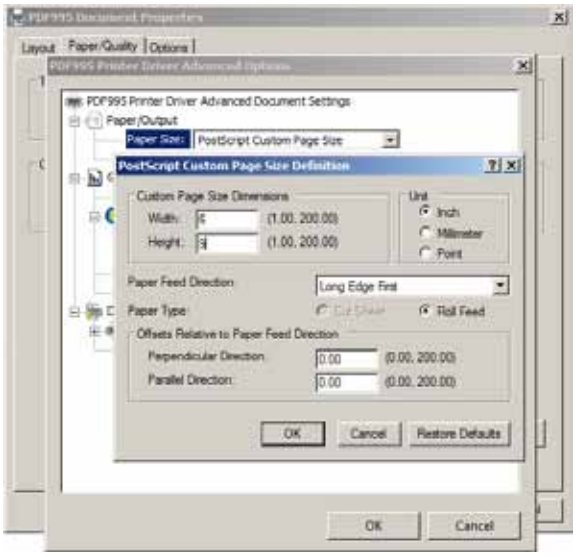


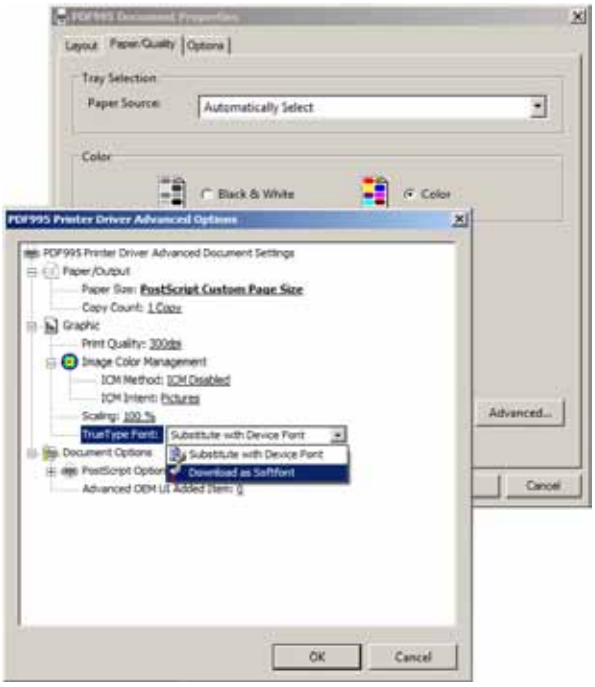
If you use a conversion program that permits selecting for black and white or color printing, make the appropriate selection. Then click on Advanced to make the rest of the necessary changes.

4 It is here we see the need for just using dpi for resolution. Digital image resolution is given in pixels per inch (ppi). A printer's addressable resolution, is given in dots per inch (dpi); and those dots can be made up of droplets of ink also given in dots per inch (dpi). And if the work is to be commercially printed, continuous tone images (JPGs for example) will be screened, that is, converted into halftone dots, measured as lines per inch, lpi (although they are dots).

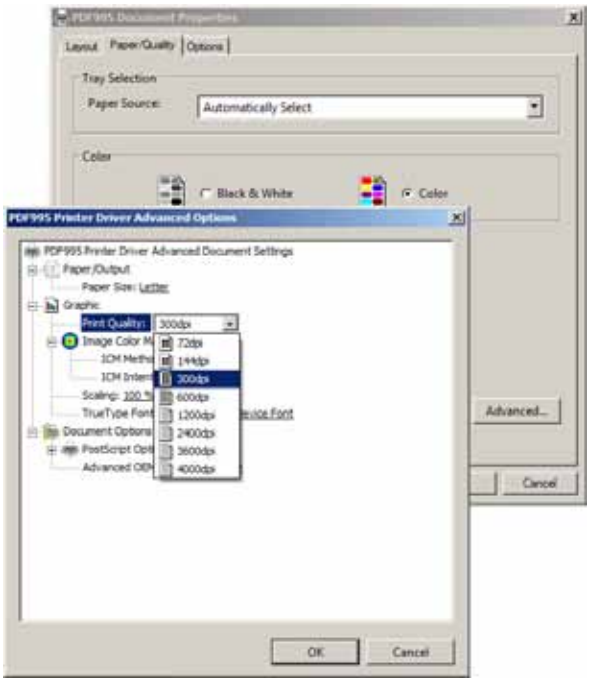


Most conversion programs default to 8.5 x 11 paper. To select the correct paper/output/trim size, open the drop down sizes and if the size of your work is not listed, select *PostScript Custom Page Size*—left. This will immediately open the PostScript Custom Page Size Definition dialogue—below. Enter the correct page or trim size.





Left: click on True Type Font for the font embedding setting. Select *Download as Softfont* to embed the fonts.



Right: to set the output resolution click on Print Quality and in the drop down menu select the appropriate resolution.

PDF Presets

Adobe Acrobat offers a number of presets that are unavailable in most other PDF conversion programs. If you don't have Acrobat, it is still worth understanding what these presets are because: they are often referenced when specifying what type of PDF is required for certain uses; they provide a sense of what features to look for in non-Acrobat programs. In Acrobat most of these features, and many more, are editable, the table indicates the default settings:

	Embeds fonts	Trans-parency	Color mode	Downsamples Color	Mono	Compression Quality	Output Resolution	PDF
PDF/X-1a	Yes	Flattens	Converts to CMYK	300/ 450	1200/ 1800	Maximum	2400 dpi	PDF 1.3
PDF/X-3	Yes	Flattens	Does not change & embeds profiles	300/ 450	1200/ 1800	Maximum	2400 dpi	PDF 1.3
PDF/A-1a	Yes	Flattens	Converts to either CMYK or RGB	300/ 450	1200/ 1800	Maximum	2400 dpi	PDF 1.3
Press Quality	Yes	Preserves	Converts to CMYK	300/ 450	1200/ 1800	Maximum	2400 dpi	PDF 1.4
High Quality	Yes	Preserves	Does not change	300/ 450	1200/ 1800	Maximum	2400 dpi	PDF 1.4
Standard	Yes[5]	Preserves	Converts to sRGB	150/ 225	1200/ 1800	Medium	600 dpi	PDF 1.5
Smallest	No	Preserves	Converts to sRGB	100/ 150	300/ 450	Low	600 dpi	PDF 1.5

Most commercial printers prefer PDF/X-1a-; however, many will accept other presets. Check with your printer. A quick overview of some popular print-on-demand, p-o-d, printers:

	Preferred Preset	Embed fonts	Transparency	Color Mode/Management	Image dpi	PDF compatibility
48hrbooks	High Quality or DoPdf	Yes	Accepts	N/A		PDF 1.4 or ?
Blurb	PDF/X-3	Yes	Flatten	sRGB; other RGBs convert to CMYK	300	PDF 1.3
CreateSpace	N/A*	Yes	Accepts with warning	RGB and/or CMYK	≥300	PDF 1.4
Espresso	PDF/X-1a	Yes	Flatten	RGB or CMYK	300	PDF 1.3
Fidlar	High Quality	Yes	Accepts	CMYK	300	PDF 1.4
Lightning Source	PDF/X-1a or High quality	Yes	Flatten	CMYK; TAC 240%	300	PDF 1.3
Lulu	PDF/A	Yes	Flatten	RGB or CMYK; TAC max. 270%, min. 20%	300	PDF 1.3

* Accepts other formats (doc, docx, rtf, pdf)

Here are comments on several PDF conversion programs (these are Windows programs). The test was run with a small file, consisting of some text in black and three images. The Word docx file (not used, was 8.554MB, and the Word doc file (used), was 4.326MB:

	Files Size	Color B&W Setting	Special Setting	Trans-parancy	Image	Text;	PDF Compt-ability
Acrobat HQ	1.911MB	No	--	Yes	RGB	K-only	PDF 1.4
Acrobat PDF/X	2.455MB	No	--	No	CMYK	K only	PDF 1.3
doPDF (free)	5.747MB	No	High Quality	No	RGB	PhotoShop K	PDF 1.5
NitroPDF	2.51MB	No	Print Ready	No	RGB	RGB Black	PDF 1.4
OpenOffice (free)	2.137MB	No	PDF/A	No	RGB	RGB Black	PDF 1.4
PDF995 (free)	1.289MB	Yes	--	no	RGB	PhotoShop K	PDF 1.3
PrimoPDF (free)	1.291	Yes	Prepress	No	RGB	PhotoShop K	PDF 1.4
Word2010	0.466MB	No	PDF/A	No	RGB	RGB Black	PDF 1.4

Where there is Black C0 M0 Y0 K100) text other black objects over color (overprint), PDFs made in InDesign default to convert K-only to overset black-- the default can be deactivated.
K-only is black ink only (C0 M0 Y0 K100).
Word's Save as PDF feature downsized the images to 200 ppi (dpi) from 300.

If you do not have Acrobat or other Adobe products that enable saving as PDFs, text is generally saved as Photoshop Black (rich black) or R255 G255 B255 (black). Text printed from these:

	PhotoShop Black	R255 G255 B255 (K-only)
Color Books	Halftone screen, darker text, 4 color, possible misregistration problems	100% black, no halftone screen
B & W Books	Screened, lighter text (95±%)	100% black, no halftone screen

See examples next two pages.

Conclusion

Acrobat is the best program to use for creating PDFs. If images are involved, given Word's downsizing, do not use Word 2007-2010 Save as PDF feature. Only NitroPDF ($119) and OpenOffice/LibreOffice, offer the security of PDF/A and full black text.

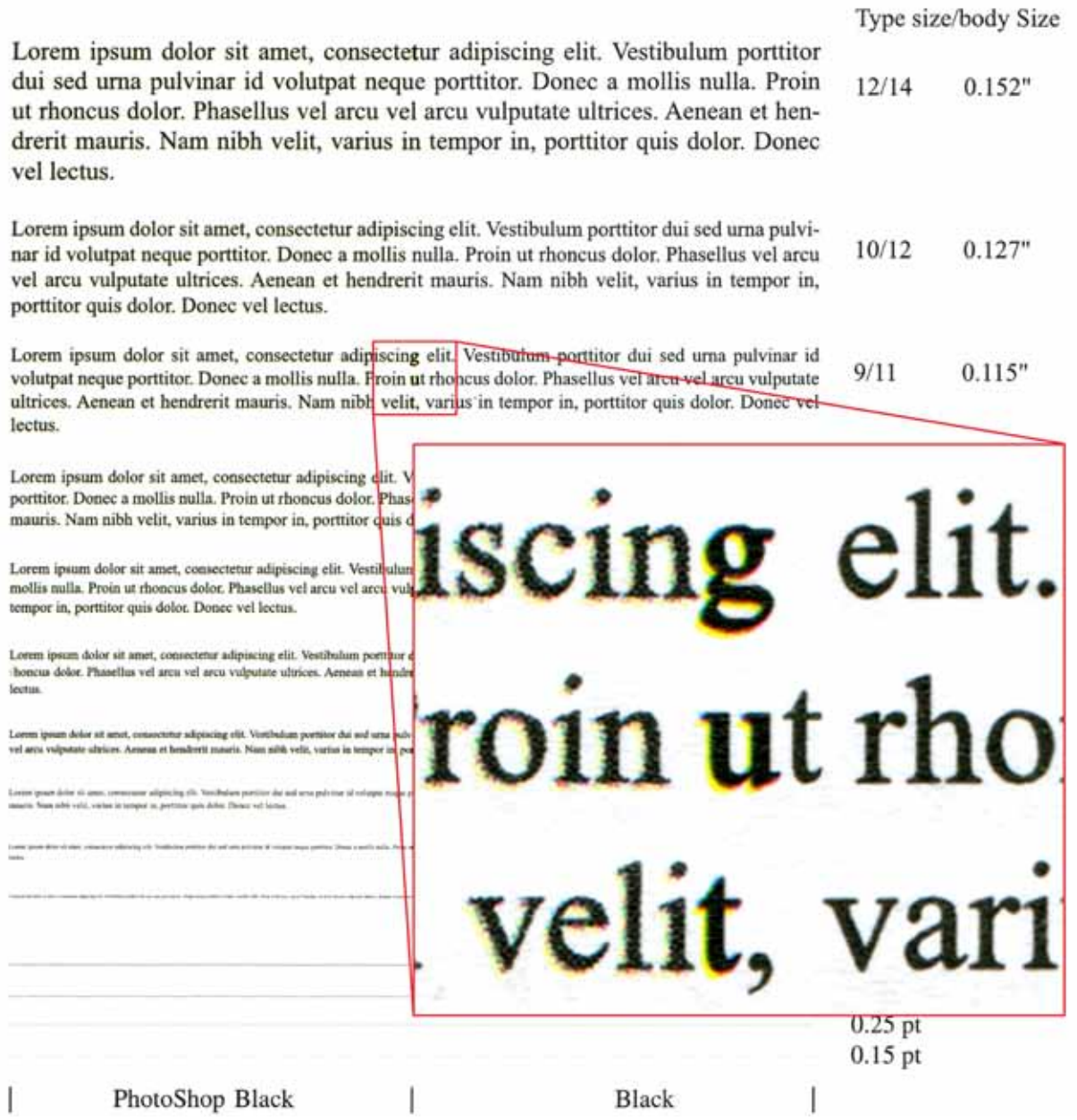
Resizing PDFs

Sometimes the trim/paper size of a PDF must be changed, but the original (source) file no longer exists.

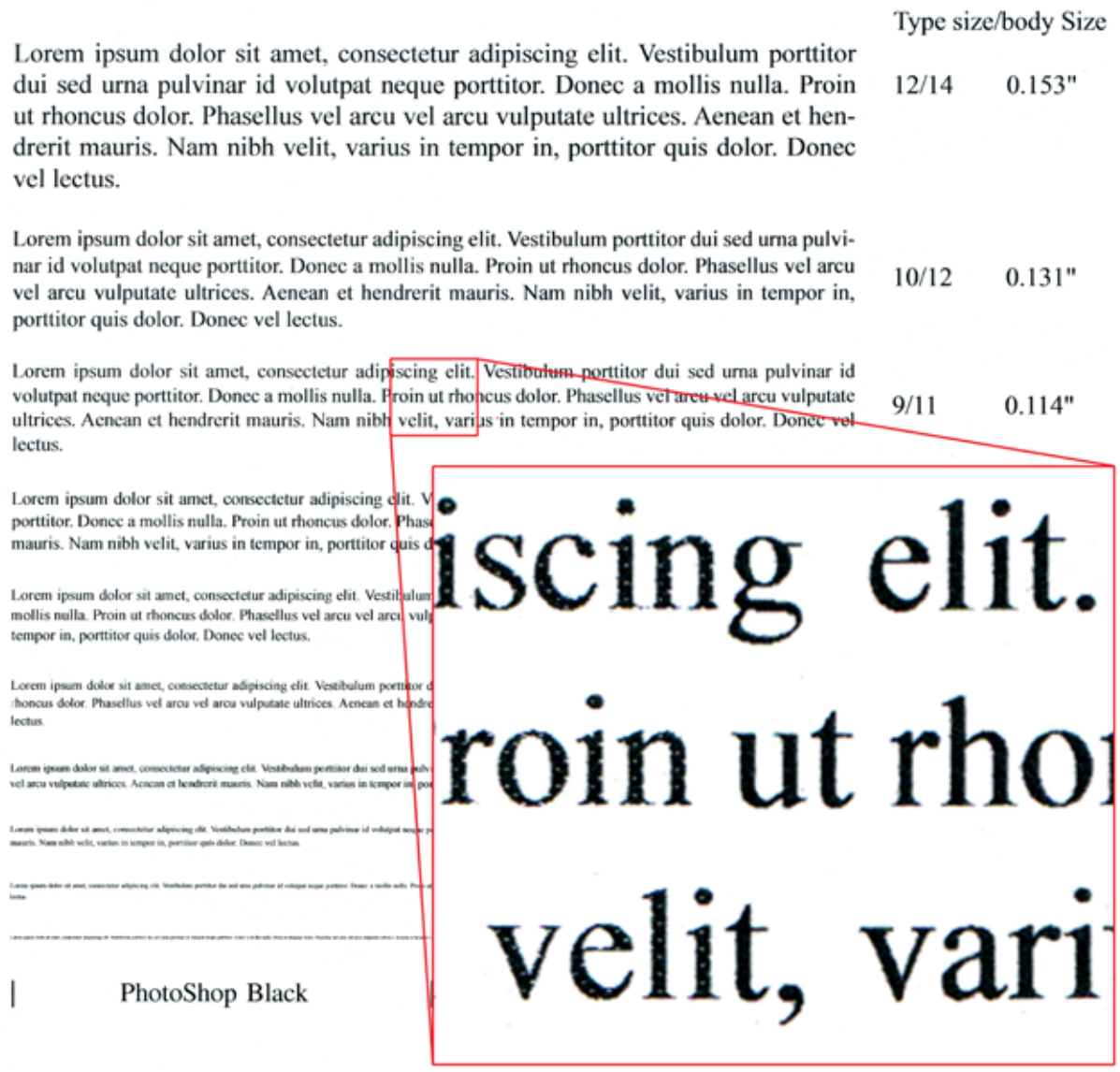
- Open the file in Reader
- File > Print > Select printer
- Select your PDF conversion printer
- Set the output size to whatever size is desired.
    - if the size is smaller, image resolution will increase
    - if the size is bigger, image resolution will decrease
    - Image proportions may change to fit the ne new size, i.e. there might be some distortion compared to the original.
- Embed fonts—select Download as softfonts.
- Make sure the graphic or print quality is set to the printer's recommend resolution, the defuault for PDF/X is 2400.

The following examples show the effect of having PhotoShop black as the default PDF black and R 100% G 100% B 100% (R255 G255 B255).

These are enlargements of five different examples. Below is a full size scan of the most out of register of the examples, D. The left side was printed using PhotoShop black, and the right side using K-only. The enlarged section shows not only the the two different black, but that some of the letters at the boundary between PhotoShop blac,k and K-only, seemed to be printed both as black vector (K-only) and with C, M, and Y.



This is the same example as the previous page, except that it was printed as a black and white book.



Note that the PhotoShop black text has been screened and is therefore somewhat lighter than the K-only text.

Printing PhotoShop black text as K-only (black and white books) is not a huge problem with the text in sizes as shown: this does not mean it couldn't be a problem with some presses or given different pressmen and setups.

Printing PhotoShop black text as color could be a problem if the registration is off.