

# Guidelines for producing print-ready digital artwork

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## Introduction

The following guidelines are intended to assist in preparing digital artwork for submission to the Print Unit. They are not intended to be exhaustive or fail safe, but following the simple pointers laid out below will help to minimise the risk of some common problems which occur when printing from digital files.

**Please note** that these guidelines do not cover use of the University corporate identity. The Publications and Branding Team can advise on the correct way to present University corporate materials, and should be consulted in the first instance when you are planning a print project.

## Printing digital images

Printing digital images can be frustrating if you don't have an understanding of **print quality** versus **screen quality**. A screen quality image, which looks fine on your monitor, will often look ragged or pixellated when you print it. This section explains how to ensure you get the best possible print result from your digital images, regardless of what computer program you are using to create your artwork.

There are two types of digital images: **vector** images and **raster** images. Vector images are usually logos or line art graphics and can be enlarged or reduced in size without affecting the quality of the printed result. Most images, including digital photographs (**Jpeg** being the most common file format), are raster images, which means that they are made up of a finite number of dots or **pixels**. The quality of this type of image when it is printed varies

depending on the size it is printed out at. For example, you might have a picture file which is 600 pixels by 300 pixels in size – **and this will not change, no matter how much you enlarge or reduce the size of the picture on the page**. So if you make the picture 2 inches wide by 1 inch high, it's **resolution** will be 300 dots per inch (dpi). As a rule of thumb, this is the maximum size you can make this particular picture without starting to compromise its quality when it is printed. If you enlarge the picture to 4 inches wide by 2 inches high, its resolution will drop to 150 dpi, because you've got the same number of pixels spread over a greater area. This will impair the output quality when you print it.

For the purposes of printed publications, all your graphics should be a **minimum of 300 dpi** to print cleanly. For large format printing (e.g. posters) a minimum of 150 dpi is usually acceptable. Web graphics and screengrabs are usually only **72 dpi**, which is screen quality and looks fine on a monitor, but terrible when you print it out!

**Note:** It won't help you much to use software like Photoshop to increase the resolution of a web graphic from 72 dpi to 300 dpi – you can't improve upon the quality you had in the first place – you need to ensure that your graphics are set up at the correct resolution from the start.

### Raster image sizes for publication print quality

The following table gives approximate minimum dimensions, in pixels, for raster images to print at publication quality at standard A sizes:

Print size	Approximate dimensions (cm)	Minimum picture size (pixels)
A6	10.5 x 15	1250 x 1800
A5	15 x 21	1800 x 2500
A4	21 x 30	2500 x 3500
A3	30 x 42	3500 x 5000

### Raster image sizes for poster quality

The following table gives approximate minimum dimensions, in pixels, for raster images to print at poster quality at standard A sizes:

Print size	Approximate dimensions (cm)	Minimum picture size (pixels)
A2	42 x 60	2500 x 3500
A1	60 x 84	3500 x 5000
A0	30 x 42	5000 x 7000

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## Microsoft Office

(Word, Excel, Powerpoint, Publisher)

Microsoft Office is the most common suite of programs used for generating documents for printing, simply because it is available to most PC users. However it is **not** designed automatically to generate documents which are suitable for printing on press, and most documents need to be manipulated or converted into a suitable format before they can be printed. In most cases, the Print Unit will be able to undertake this work for you. It will make our job easier, however, if you note the following points before submitting Office documents for printing.

### 1. Check page setup

This may seem obvious, but make sure your document is set up at a standard UK page size before you begin. This is usually A4, but may be A5 or A3. Word documents sometimes default to US letter size which can cause problems when the document is printed on A4 paper. Powerpoint's default page size is screen size because it is designed to be used for on-screen shows, so if you are setting up a document for printing using Powerpoint you will need to change this to the page size you intend to print on.

### 2. Use page breaks

This is particularly important for long documents set up in Word. Word reformats documents automatically as it goes along, which can cause text to reflow from one page to another, particularly if you transport the file between different computers or different versions of Word. This can result in problems like the pages re-numbering so they no longer agree with your *Contents* page, or section headings appearing at the bottom of a page with no content beneath them. This can easily be prevented by inserting page breaks where appropriate, instead of just hitting the *Return* key until you reach a new page.

### 3. Use standard fonts

It is always sensible to stick to standard fonts like *Arial* and *Times New Roman*, as these are installed on virtually every PC – so whichever PC you open your file on, the fonts will always appear the way you are expecting. PCs can only display and print fonts which are installed on their hard drive, so if you use a special or unusual font, there is a good chance that we won't have it installed on our computers, and we won't be able to print it correctly. Unfortunately, in most Office programs there is no way for us to know whether you have used a font which we don't have – the computer will simply substitute a different one, and we won't know anything has gone awry until we receive your complaint.

### 4. Avoid using web graphics or clipart

It is highly advisable to avoid using any graphics, logos or clipart images which you have downloaded from the web, or photos saved from a web page, unless you are certain that they are high-resolution graphics specifically for printing. Screen-grabs or pictures cut and pasted direct from web pages look fine on screen, but will look very poor when printed and should be avoided wherever possible. This is particularly important if you are setting up a poster or any item where you want to blow up a graphic or picture so that it prints out at a large size. The more you enlarge a graphic, the worse it's going to look when it's printed. For more detailed guidance on using digital images, see the previous section *Printing digital images*.

### 5. Avoid using transparent backgrounds

This tends to crop up in Word and Powerpoint when setting up tables and backgrounds for posters. Office will allow you to make a background colour 'transparent' to reduce its intensity or let an image behind show through. This looks fine on screen but it causes all sorts of problems when we try to print it. Often, a transparent background will turn into a messy crosshatch pattern when it is printed, and it will rarely come out as intended. We would advise against using transparent colours in Office wherever possible.

## PDF (Portable Document Format) and other graphics file formats

PDF is becoming increasingly popular as a method for submitting artwork for printing, because it generates smaller files and, when used correctly, it ensures that all graphics and fonts are properly embedded so that they will print correctly no matter what computer you print them from. Nowadays new computers ship with a PDF writer built in, but this is not always the case. Where this is not the case, you will need to have access to software which allows you to create PDF files – from Word, Powerpoint, or whatever program you have used to set up your document. The most well known is **Adobe Acrobat**. Most PCs have **Acrobat Reader** installed on them, but this does not allow you to generate PDF files – only read them. The full version of the program is required to generate PDF files, but it isn't free! There are, however, some PDF writing programs available on the web which can be downloaded and installed for free, most notably **Cute PDF**. Mostly they work like a printer driver: instead of printing to your desktop or network printer, you select PDF as your destination printer, and then choose your formatting options from the print dialogue box.

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PDF is a great tool, but it is not failsafe – it will only work properly if used correctly. The following points should be noted when generating PDF files:

## 1. Choose the right quality setting

Most PDF writers will give you some kind of choice as to what level of quality you want your PDF to be. This will either be in the form of a description (e.g. “low quality”, “standard”, “press quality”), or output resolution (e.g. 72dpi, 300dpi, 1200dpi), or both. As a rule of thumb, it is usually best to choose the highest available quality setting, as it’s safest to make your PDF better quality than you need. Look for “print quality”, “press quality” or “high quality” and 300dpi resolution or more. “Low quality” or “screen quality” or resolution between 72dpi and 150dpi will not usually yield good results and should therefore be avoided.

**NB:** even if you’ve selected “press quality” and 1200dpi, if the document you’re printing contains low resolution graphics (e.g. screengrabs or web graphics), the resulting PDF will not necessarily be print quality – you can’t improve on the quality of the graphics you’ve used in the first place!

## 2. Always embed your fonts

As with Microsoft Office, if our PC doesn’t have the fonts you have used in your document installed on it, it will substitute them for something else – which can have unexpected and unwanted results. However, you can choose to embed all the fonts you have used in your PDF when you create it. If you do this, it won’t matter whether we have the fonts you have used or not – the PDF will contain enough information to make sure that your fonts print out correctly.

## Other graphics file formats

Many programs allow you to export your document as a graphics file, which, like PDF, will allow you to embed all the fonts and graphics in a single file. There are dozens of different graphics file formats, the most common being **JPEG** (.jpg), **TIFF** (.tif) and **EPS** (.eps). However, saving your document in these formats should be approached with caution. A lot of programs, notably Microsoft Office, will allow you to save your documents as Jpegs or Tiffs very easily, but do not give you any control as to the image quality of the resulting graphics file. In most cases, the resolution of the graphics file will default to 72 dpi – which is low quality, suitable for screen viewing but not for printing. This is a particular issue in Powerpoint and can cause big problems when Powerpoint is used to create artwork, particularly for posters. Another difficulty with turning your documents into graphics files is that the

resulting files tend to be massive (in terms of memory) and very difficult to handle – they might be too large to send by email, for example. Because of this we do not recommend that graphics file formats other than PDF are used, except in conjunction with DTP software as appropriate (see below).

## Professional DTP software (e.g. Quark XPress, InDesign)

**DTP** (desktop publishing) software is specifically designed to prepare documents with a view to having them printed on press. They work alongside a family of graphics and imaging programs, e.g. **Photoshop** and **Illustrator**. The graphics programs allow you to create and manipulate graphics files, and the DTP software allows you to organise these graphics onto the page along with your text. DTP programs can be tricky to use until you’ve had a bit of practice, and in order to use them correctly, some basic knowledge of printing processes is required. For the purposes of this document it is assumed that if you are using this kind of program, you will already have this knowledge and be familiar with use of DTP software. However, the following tips will help ensure that the files you submit are print-ready.

### 1. Use the right colour type

There are several ways in which computers handle colour in picture files, the main two colour modes being **RGB** (red-green-blue) colour and **CMYK** (cyan-magenta-yellow-key [black]) colour. RGB colour is based on properties of *light*, and is suitable when images are to be viewed on screen, not for printing with ink or toner on paper. CMYK colour is based on properties of *ink* and should always be used when a colour image is to be printed. The colour mode of your graphics files can be set to CMYK from within your graphics program; the colour mode of your document text can be set from within your DTP program.

In addition to RGB and CMYK colour, you may also need to work with **Pantone** colour, if you are creating a document which is to be printed in just one or two specific colours (e.g. the sussex corporate ‘flint’ colour, which is Pantone colour 309). The **Pantone Matching System** is a universally accepted system which allows you to specify the exact colour ink you want to use, based on a pre-defined colour scale. If you’re using Pantone colours, you can’t use CMYK graphics alongside them, unless you’re intending to print your document in full colour with additional Pantone colours on top – which will increase the cost of your print job. To print only in Pantone colours, you need to make sure that your graphics are suitably set up. The usual way



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of doing this is to convert them to greyscale (i.e. to discard the colour information and save them as black and white) and then to allocate them the Pantone colour you are using from within your DTP program.

## 2. Check the image resolution

Image quality is explained in detail in the first section of this document – but worth a reminder here. For publication print quality any raster images you are using must be a **minimum of 300 dpi at the size they are to be printed**. An image which is 300 dpi at A6 (postcard) size will effectively drop to 150 dpi if you decide to fill an A4 page with it, so make sure the images you are using are of suitable quality for the size you want to print them.

## 3. Remember to allow for bleeds

This one is important – and often overlooked.

A **bleed** is where an image or background colour is positioned so that it sits right on the edge of the page. If you're working on a document that has bleeds you need to make the object that bleeds off the page overlap the edge of the page by at least 3mm (see diagram opposite). The printer prints the document on a larger paper size than the document size, and then trims off the excess at the edges. The extra 3mm bleed gives him a bit of extra print to crop into, ensuring that the image does, indeed, bleed off the page, without any visible white border.

If bleeds are not included, then to preserve the appearance of the bleed, the printer has to cut into the edge of the document and you'll end up with a printed document which is 4 or 5mm narrower and shorter than you intended. If you've got some text very close to the edge of the page (page numbers, for example), these might be partially or completely cropped off.

## 4. Saving to older ('legacy') versions

Software companies being businesses, new-and-improved versions of their programs are released every week, it seems. In reality the differences between, say, version 5 and version 4 of a given program are barely, if at all, noticeable. However, this can be a problem if you submit your file to us in a more recent version of the program than we have – we can't open it! This can be remedied easily by back-saving to an earlier (sometimes called 'legacy') version, usually via the *Save As* (Quark) or *Export* (Adobe) functions. An up-to-date list of software versions held by the Print Unit can be found on our website at [www.sussex.ac.uk/efm/services/print-unit-services/printing-services/placing-an-order](http://www.sussex.ac.uk/efm/services/print-unit-services/printing-services/placing-an-order)

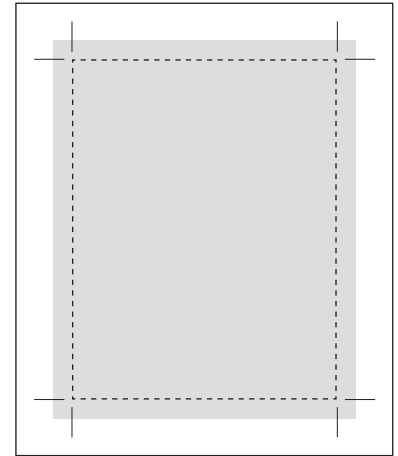
## Allowing for bleeds

The **white rectangle** denotes the oversized sheet onto which the page is printed.

The **dotted line** shows the edge of the finished page after printing and trimming to size (**NB:** should **not** appear on the artwork).

The **shaded area** shows the area which is printed, allowing for bleeds on all sides (min 3mm overlap).

The marks at each corner are **crop marks**, showing the printer where to cut.



## 5. Make sure you supply all the right files

In order to conserve memory (picture files often being very memory-hungry), most DTP programs will not automatically embed all the graphics and fonts you have used in the DTP document. Instead, the program creates links between the document and the graphics files you have used. When the document is taken to the printer and the file is re-opened, the program looks for the linked files and can only print the document correctly if the links are intact and the program can find them. Similarly, the printer can only print the fonts you have used correctly if he has those fonts installed on his computer – which he may or may not have. So it's important that you provide all the fonts you have used too, in case the printer doesn't have them. This means that there are 3 different elements which you must provide in order to print your job correctly:

1. **the document** (i.e. the DTP file);
2. **the graphics** (i.e. all the pictures, logos, etc. as separate image files);
3. **the fonts**.

Fortunately, most DTP programs have a handy utility which ensures that you supply all the necessary files every time. In Quark XPress it's called "collect for output"; in InDesign it's called "package". This utility will gather together all the elements required to correctly print the document (document, graphics and fonts) and put them in an output folder along with a report detailing the contents. It is highly recommended that you use this tool when sending DTP files for printing. It can be done manually, but it is very easy to inadvertently miss something out, which will cause either printing errors or delays.

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