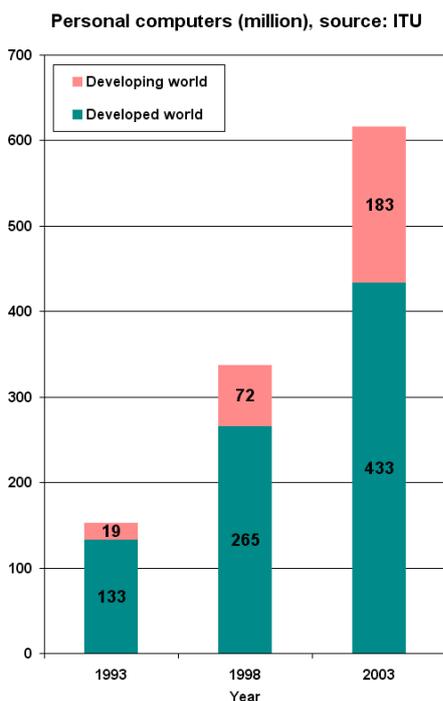


Prepress is the term used in the printing and publishing industries and includes all the processes and procedures required to transform original copy and art into a state that is ready for reproduction by printing. The form of delivery from the customer is usually electronic and in most cases a PDF but application files created from such programs as Adobe InDesign or QuarkXPress may also be accepted.

Over the last two decades the processes and services encompassed by the term prepress have changed. This is because of advancements in technology, hardware and software.

The following items have each been considered part of prepress at one time or another:

1. Typesetting is the arrangement of textual elements in graphic form. Before the advent of desktop publishing, typesetting of printed material was produced in print shops by compositors or typesetters working by hand, and later with machines.
2. Copy-editing, is the work to improve the formatting, style, and accuracy of a manuscript.
3. Markup is an artificial language using a system of annotations to text that may give instructions regarding the structure of text or how it is to be displayed or make not of any corrections
4. Proofing involves creating an accurate replica of the artwork before beginning production. This serves as a contract between the printer and their customer that the final product meets an agreed upon standard. Proofs in general can be done for all parts (images, illustrations, texts and colours) of print product and can be a hard copy or soft copy.



5. Proofreading traditionally means reading a proof copy of a text in order to detect and correct any errors.
6. Screening and adjustment of a continuous-tone of images such as photographs
7. Imposition, or the combination and positioning of many pages into a single document in signature form.
8. Separation, or specifying images or text to be put on plates applying individual printing media (inks, varnishes, etc.) to a common print.
9. Manufacturing of plates, should be well planned and delivered beforehand. Also, the cost should be calculated as well.
10. Producing a high-quality print (PDF) file, which is used for the final printing.
11. Paper select, choosing a proper paper.

In the mid-1980s, the introduction of the Apple Macintosh and personal computers, page makeup software (Aldus PageMaker [now Adobe PageMaker], Adobe InDesign, QuarkXpress), and the Adobe PostScript page description language allowed the output of digital pages either as proofs on low-resolution laser printers or as film on high-resolution imagesetters. It is these advents that are largely responsible for the creation of desktop publishing and the increase of computer-aided prepress techniques. By the early 2000s computers were part of the mainstream for prepress and traditional techniques using dark rooms, light tables and large format camera had been superseded by digital processes that are less costly, more efficient and reliable.

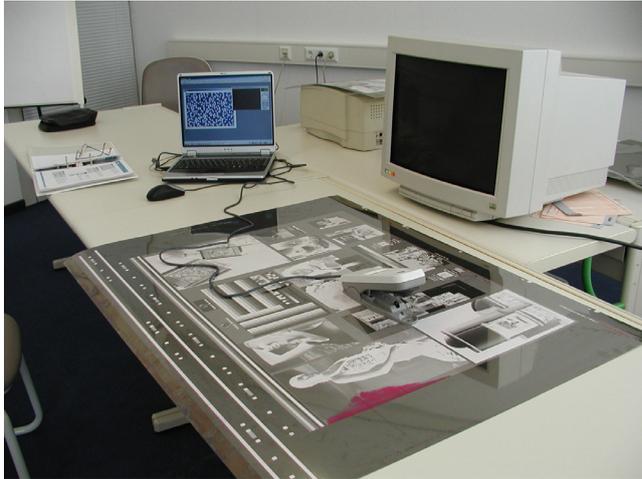


The skills required in prepress have also changed greatly with the evolutions in technology encouraging a digital automation of the process. Originally, large cameras were used to make emulsion-based copies of text and images, the film was stripped and assembled to be exposed from one emulsion to a plate for printing. Today, the accessibility of desktop publishing and word processing programs means that copy and art can be composed by the one person and using the one computer. These files can now even be output directly to a digital printer or a printing plate using Computer to Plate (CTP).

CTP uses an imaging system, either visible light or thermal to map the copy onto the plate. Plates can be Photopolymer, Silverhalogen or thermal, each type is suited to certain conditions and specifications. Conventional plate making was done computer to film. The print file was output onto a photographic film and using a plate burner this film is then burned onto a lithographic plate. The plate is then put on an offset printing press for a print run. Printing plates can only be imaged once so are only good for the one job. It can be costly to both the printer and the client to print a short run on an offset press. Digital printing has provided a (cost efficient) alternative.

The Proofing process has changed for Prepress also. Many different types of proofs are now created and each for a different use. A contract proof is hard copy and used as an agreement between a printer and client that the final work will meet an agreed upon standard. A client may also ask for a soft copy proof, usually in the





form of PDF, and because of the advancements in technology and the commonplace of computers and internet it is now possible to provide this relatively quickly. Soft proofing is done with colour management software applications and (usually) calibrated monitors, the software uses ICC profiles to compensate for the differences in RGB and CMYK colour spaces and the difference in appearance on screen as opposed to in print.

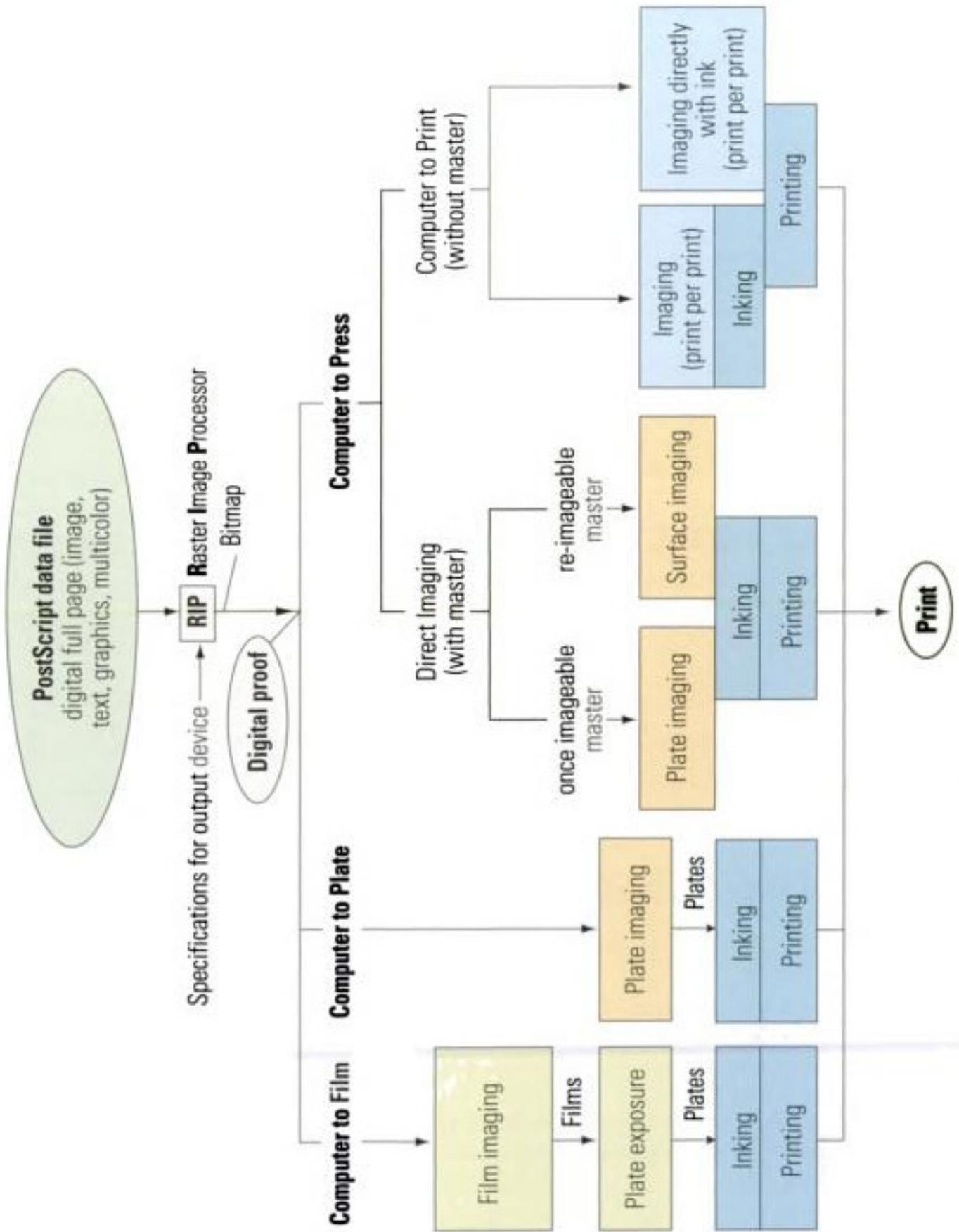
Another proof type is press checking where a client will arrive after the press is set up but before the print run is started and will advise on any colour corrections, registration issues and other defects that may be present. A proof can also be created as an internal control, created for use between prepress and print departments. The development of proofing devices has increased the accuracy of finished products.

As prepress has become more digital so too has the printing. In the last ten years digital printing has doubled its market share while lithography has lost almost 20% of its market share. In digital printing no plates are used and in many cases a different pigment, toner, is used.

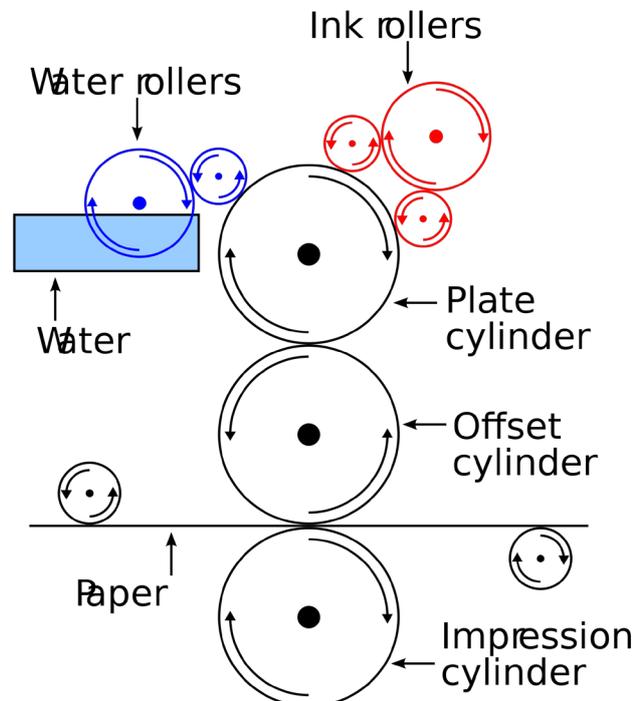


Once a file is created and completed in prepress it is sent directly from the computer to a RIP and converted into a raster graphics image. By RIPping the file a bit-map image of the page is created and guides the imaging device to print the ink dot in the correct place. Digital toner does not permeate the paper as traditional ink does, instead it creates a thin layer on the surface and is fused to the paper by heat or UV curing. Digital printers have become inexpensive and very accessible to home and office users, and the technology means these users can print on demand. Printing digital also means that an image can be personalised easily, which can be very useful in letters, mail-outs and subscriptions.





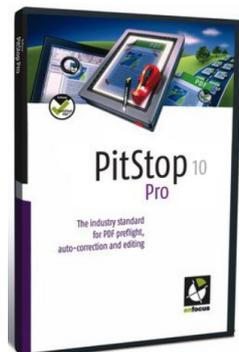
Offset printing is still the standard method for printing large run products like newspapers, catalogue, magazines. Offset printing uses two methods of paper feed: Sheet fed and Web fed. Sheet fed presses consume single sheets of paper, cut beforehand. Web fed presses are fed a continuous roll of paper that is cut after it is printed. Offset printers are made of cylinders and rollers that transfer an image. Ink and water rollers transfer ink to a plate wrapped around a plate cylinder, the image is offset onto a rubber blanket cylinder and from the blanket the image is printed onto the paper. This is describing a positive plate press, negative plates can also be used but a blanket roller would not be needed.



The implementation of page description languages such as PostScript and Adobe PDF (Portable Document Format) have provided a standard for document exchange within the industry. However PDF was slow to be accepted as Adobe Acrobat was not freely available, reducing its usefulness on the internet. Also, due to the limited power and capacity of computers at the time, larger PDF files were slower to download and render. There were also competing formats such as Envoy. Adobe soon made it's Acrobat Reader program available at no cost to promote PDF's and its popularity has now superseded most of its competitors with the exception of DjVu a format originally targeted at libraries for preserving books and documents. Both PDF and PostScript were co-created by John Warnock of Adobe Systems, PostScript in 1982 and the PDF in 1993.

PDF has now become the de facto standard for printable documents on the web and in the Printing and Desktop Publishing industries. PDF combines (a subset of) PostScript page description language, a font embedding system

and a storage system to package all associated elements into a single file. This means that by creating a PDF of a document all information is packaged within the PDF. Fonts do not need to be supply, and nor do images. PDF has greatly enhanced the way in which prepress is done presently. PDF workflow and preflighting programs

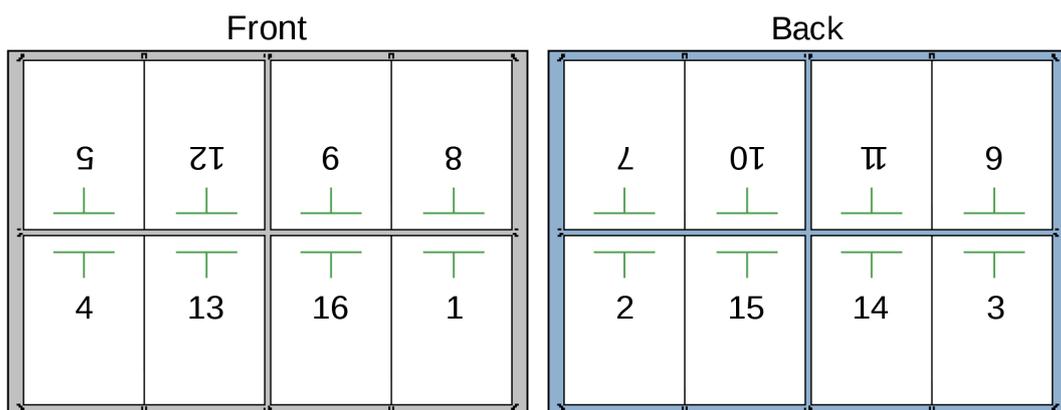


like Enfocus Pitstop mean prepress operators can quickly screen files for any problems that may arise in printing before the file is printed - reducing wasted time and materials.

PostScript is a page description language that uses an interpreter to generate an image of the document. PostScript has been used by Adobe in its raster image processor (RIP) applications that drive printers and proofers. The first software RIP was introduced in 1988 by Hyphen Inc. Up until this point RIP software was custom made by the hardware company for its own RIP and inbuilt into it. The Hyphen Inc RIP used PostScript and was run on a standard PC platform. Many software and hardware companies have integrated Adobe PDF compatibility into their products now, like:

Agfa Graphics, CREO, Dalim Software, Dainippon Screen, EFI, FujiFilm, GMG, Heidelberg, Kodak NEXPRESS and Graphic Communications, Océ, Xante and Xerox.

Imposition is an area of prepress that has also benefited from digital automation by way of software advances. Imposition is the positioning and alignment of documents and the pages within a document. The arrangement of these pages has to take into consideration factors such as finishing requirements (binding, either perfect or saddle-stitching, die-cutting, celloglazing etc) and also be economical (fit as much as possible up on a sheet and reduce waste paper). Imposition can also be affected by the size and format of the file, the number of pages, the number of copies required, the grain direction of the paper. Software packages such as KODAK Preps Imposition Software and plug-in program such as Quite Imposing have included 'one click' actions that perform an imposition (with a few specifications input from the operator).



Before the availability of these software packages imposition was completed manually. Originally, pages were set into a metal frame called a chase and locked into place using wedges called quoins. More recently a technique called stripping was used. Stripping was a long process done on a light table and pieces of exposed film were stripped and arranged in the correct layout (sequence and orientation).

Stripping was done with extremely high precision as each ink colour is on a separate piece of film and had to register perfectly together on press. Imposition can be done at the design stage, after design during prepress or after prepress - using print driver impositions or output device impositions. An imposed layout is also known as a printer's spread, in comparison to the reader's spread which displays on screen as it will appear when printed eg spreads.

Since the late 1980's many digital advances have occurred for prepress: QuarkXPress and Adobe Illustrator 1.0 are both launched in 1987, and in 1989 CorelDRAW 1.0. The first digital proof printer is launched in 1987: the Iris Graphics' Iris 3024. In 1988 HP's DeskJet printer is hugely popular and begins the influence of inkjet print technology in graphic arts. In 1990 Xerox created what is considered the first print on demand system know as the DocuTech, and imposition programs such as Imposstrip for Ultimate Technologies are shown at the Drupa trade show for the first time. Rampage RIP and EFI Fiery RIP were both launched in 1991, the later being a huge success for digital copiers. The first stochastic screening algorithm is created by Agfa and the International Colour Consortium (ICC) is founded in 1992.

At my workplace, Pure Colours Digital Imaging, in the 5 years that I have been working we have grown, as company, hugely. When I started we were three people (two prepress and one accounts). We were setup in two small rooms rented from and within, another printing company. We then expanded into our own factory and started offset printing inhouse with a Heidelberg QMDI. Gradually over the next few years we added a separation prepress studio next door to the factory and more equipment like Konica Minolta digital printers, a perfect binder, HP long printer for posters up to A0 size. Also added were many finishing equipments for saddle stitching, celloglazing, trimming and scoring. Currently we now have over 15 employees (three in prepress), we have four digital presses including the just purchased C8000 from Konica Minolta, two guillotines. We have also over the new year moved into bigger premises to accommodate the expansion and arrival of the new equipment.



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