



*HIGH SPEED PRINTING  
FOR CENTRAL LONDON*

# **7 most important differences between Digital & Traditional Print**

## **How to make the right choice for your project**

**By Cliff Finn**  
Managing Director

## Introduction

The huge growth of the digital printing market has brought more options and exciting new features to today's commercial printing. But from our experience it's also brought some confusion...

An understanding of the advantages and disadvantages of digital printing and how this compares to traditional lithography is critical in making the right choice for your printing.

Here at First Colour we run both technologies so we are genuinely in a position where there is no financial bias to us either way, whatever method we or the client chooses. The choice will always be the best possible process for that particular job and that client.

## Definitions:

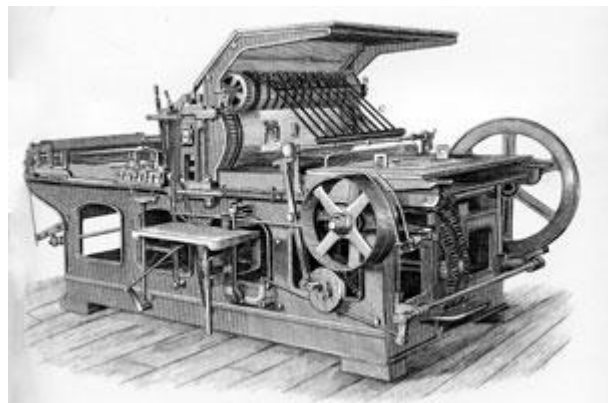
**Lithography** – The traditional printing method using an offset press and real ink - this process effectively 'presses' the ink into the paper. The image that is pressed onto the paper stock is etched onto a metal plate using lasers in a plate maker and the plate(s) are then mounted on the press. Plates are created in separations for the colours being used. For example, if a 4 Colour CMYK press, like ours, is being used, four plates, one for each colour are created. Because of a complicated and time consuming set up, offset printing is intended for larger runs, with longer turnarounds.

**Digital Print** – Usually 'toner' based machines that use a process similar to normal photocopiers, but are a lot more sophisticated. Their direct connection to a PC enables jobs to be sent electronically.

### Litho was the traditional way, so is this the most common form of print?

Lithographic printing was the accepted traditional form of printing and the most common form of print – and up until quite recently still dominated. But other methods of printing have gained massive ground over the last 10 years, and have seriously challenged the inherent weaknesses, or inconvenience factors built into litho print. Namely speed, waste and cost.

The most dominant 'other' print method is of course Digital with the advanced development of the simple photocopier and the 'productivity enhancing' process of connecting them up to PCs. We now call them Digital Presses, but they are really photocopiers on steroids!



*Early Victorian example of a litho press - the process is still more or less the same*

Having said that, over the last 5 years the quality, capacity and speed of these digital machines has increased exponentially to the point now where they are a genuine, and in some cases better, alternative to litho print for certain sectors and job types.

Digital print has been gaining ground on the litho market for over 10 years, and is at the point now where it is on the verge of becoming the dominant technology.

### **So digital is growing from strength to strength...**

In 1998 Litho had an 89% market share of the total print market, with Digital print at 8%. In 2012 that statistic had changed to 51% litho and 45% Digital – the forecast for 2014 is for Digital print to grow another 30%!

Litho machine manufacturers did initially respond by 'digitising' (modernising) the set up processes on their presses making them faster and easier to set up - this slowed the digital growth for a short while, but like King Canute – the inevitable tide cannot seem to be stopped.

Once the quality issues were overcome and these digital machines, certainly from our standpoint, started producing a commercially saleable sheet, the digital machine manufacturers such as Xerox, HP Indigo and Canon turned their attention to speed.

Our first digital machine in 1998 – a Canon 500 – produced 5 copies a minute – now each one of our fleet of Xerox Digital presses is capable of 80 sheets per minute, even if we're running a heavy card stock.

It is this capability and performance that underpins and drives our business. We specialise in fast turnaround work and our business is now split between 50% Digital work versus 40% litho. We have found that the print market in Central London is particularly suited to quick turnaround digital print.

It's the timescales and unbelievably tight turnarounds that drive it all along. No one's got enough hours in the day, let alone time to wait 3-4 days for a litho print job that would, in a lot of cases, be binned after use e.g. presentation materials.

Most of what we do now is fast turnaround same day digital work - it's literally all day long now, so let me explain some of the differences between Digital and Litho, and some of the advantages and disadvantages of digital print :-

### **DIFFERENCE #1 There is no economy of scale for digital print**

Once a digital job is running, unlike litho, the cost per sheet does not improve as the run progresses. This is because the digital machine manufactures levy a per sheet equipment maintenance charge to printers like ourselves known as a click rate. So each sheet produced costs us exactly the same no matter how long the run. But printers like First Colour do offer discounts for higher quantity runs in order to be competitive and generate the maximum amount of business - even though the manufacturers charge a flat rate per sheet no matter what the quantity.

So no, there aren't any economies of scale, except on the larger digital presses where more than one sheet can be mounted, but that's currently a very small, but rapidly emerging, part of the sector.

This situation is the reverse of litho where most of the costs are 'up front' in the time consuming set up phase, and so the longer the run the lower the sheet costs, as the fixed up front costs are amortised over more and more sheets.

### **DIFFERENCE #2 Speed**

Digital printing can provide a much quicker job due to the no 'set up' requirement. We still have to prepare the file and check for the usual issues, but it gets rid of all the old fashioned litho printing process, with traditional plates and inks now not needed.

In addition, no drying time is required and the digitally printed sheet can be sent straight to the finishing department for binding, lamination etc. In essence there are many less steps in the digital printing process, and as a result the delivery time is quicker.

### **DIFFERENCE #3 Cost**

Digital printing can deliver quite substantial financial savings through 'print on demand' and this has been a key driver to its development. Customers now only buy print exactly for the quantities they need. Litho printing has always had minimum orders to make it viable, due to the high set up costs.

With litho printing, whether you're printing a few hundred or two million sheets, there is always set up costs built into the price. That cost becomes 'diluted' as the number of prints rises. The press has to have the plates made and then fitted, and be 'inked up' (make-ready). Then when the press starts up it needs a hundred or so sheets to get up to colour - sometimes more, and that's what we call waste. We do however reuse every make ready sheet etc to minimise the waste.

With digital printing these days those factors are totally avoidable and the end user can get just one print with zero cost penalties. This means that the customer gets exactly what they want, exactly when they want it.

Cost and budget issues are very important when choosing how to print your project. Essentially, if you have a low volume print job, digital printing will be cheaper and far more cost effective than traditional offset printing.

### **DIFFERENCE #4 Short runs**

The major advantage of Digital print is that ultra short print runs are now totally viable. Digital print data is very easy to store and even easier to be changed and updated, so an infinite number of different versions can be sent to the printer.

This new scenario for printing gives great flexibility to the end user – clearly, there's very little point in customers holding bulk print stock when they can just 'order on demand'.

## **DIFFERENCE #5 Variable Data**

If printed digitally, each sheet is able to use different data – allowing for greater personalisation either by printing different text or even different images on each page – or both. Traditional litho print presses need to be supplied with a separate printing plate for each sheet – you can imagine the number of plates required to compete with Digital print for say 50 sets of a 32 page PowerPoint presentation, and the resulting cost.

With the option of variable data and the ability to do short runs, our customers can truly ‘bespoke’ their message to their clients or audience. Companies that utilise this can produce exactly what they want and totally dictate when they want it, with it all specifically relevant and tailored to their individual clients.

Digital variable data print enables smarter marketing – it gives direct marketers a highly effective way to talk with their customers, one-to-one. 49% of print professionals agree that variable data print has increased profits.

## **DIFFERENCE #6 Green Credentials**

In the main, digital machines cannot claim to be as focused on ‘green’ issues as their litho counterparts. This is due to major efforts by the press manufacturers to move away from the traditionally held and probably fairly accurate view that litho printing is not an environmentally friendly process.

So quite a few environmental solutions have been made available to the litho printing trade with many former chemical processes replaced by cleaner methods e.g. laser etched plates that are produced using zero chemicals. So in order to play our part and also qualify for our environmental accreditation ISO14001 we now litho print using vegetable inks, and produce printing plates that are made from recyclable aluminum.

However, the digital machines still score good environmental points for low, or no paper waste from print runs, as well as only printing exactly what’s needed.

## **DIFFERENCE #7 Paper Stock Flexibility**

The paper stock options continue to improve for digital printing with the emergence of specialty papers and finishes, but it has been an area that has held back the growth of digital printing. The digital printing process creates a lot of heat that effectively dries and bakes the paper stock. Up until recently only specially designed paper could withstand the process without permanently distorting the final sheet.

Litho presses can print onto just about any kind of paper or card as it generates little heat. This litho advantage has been eroded though over the last few years with paper and press manufacturers slowly addressing the issue, and the majority of new digital presses are able to now run most stocks and weights.

In addition digital print paper suppliers have been able to develop a few unique paper products. The Xerox tear-proof paper is just such a product which we supply to a few clients that are using the printed product in the outdoors e.g. mining companies. This is almost a

plasticised paper and it can't be torn or ripped, so that in outdoor, maybe damp and or wet hostile environments, it's a product that is impervious to the weather and can be cleaned with a damp cloth. There are also special presentation folders available specifically for digital machines, meaning that ultra short runs – 1 or 2 – is actually viable.

### **DIFFERENCE #8 Colour Matching/Quality**

The Digital printing process simulates different colours using a four-colour matching system, that unless carefully controlled can be difficult to match to a specific colour(s) or pantone (the industry wide recognised colour specification).

Litho on the other hand can produce colours that are absolutely spot-on with the standard 'pantone' reference guide, and will hold it consistently throughout a print run.

### **With Digital, is it true that the proof that you produce is effectively what people are going to see as the finished job?**

Exactly. What you see is what you get.

A big advantage in digital printing is the proof accuracy. Very detailed samples can be made, which will give you an exact replica of the job about to be printed.

We recently showed a customer of ours a digital proof for his job which he mistook to be the litho finished product, and was so impressed they said "right I'll take them all now then". When we explained that this was only the digital proof and that we planned to send it to our Heidelberg Presses he thought we were crazy and asked us to point out why this wasn't a perfectly acceptable print? Which actually we couldn't! So we printed it digitally there and then while he waited. Another digital convert!

### **Compared to litho, where you can't do that ...**

The same thing can be achieved with litho – but it involves setting up the press as if you were going to print the whole job, but then just print one – this is called a 'wet proof' and, as you can imagine, it's very expensive. Of course once it's approved it has to go on the press again – maybe a few days later - and a second set of set up costs apply.

There are other proofing techniques for litho – ironically most being digital - some for high-end inkjet machines which will produce a proof that is colour accurate, but cost-wise these can still work out at £30 plus.

### **With most digital jobs, do people actually bother with proofs?**

Typically we will get a PDF from the customer to print from so there is little point returning that PDF to the customer to get approval, although some still ask. One of the advantages of dealing with a local print business is to drop in and get them to run one sheet – generally we don't charge for this providing they print the job with us!

## **Is the artwork required for either the digital or litho process different?**

Essentially it is the same, we have to do a lot more to a litho file once it gets to us to enable it to slot into our press workflow. But other than that, the PDFs most customers provide are pretty similar – litho or digital.

## **What other advantages does Digital have over litho?**

The faster turnaround is the most significant advantage in our market place. 80 - 90% of the digital work we do is completed same day. Without digital that speed of service would simply not exist.

Ten years ago the digital machines were just coming into play, but the colour consistency on those early machines changed from day to day and even job to job. Nowadays - if the artwork is good - the final result is almost indistinguishable from litho.

A most interesting aspect, and a big digital print advantage, is its ability to print quite low quality graphics i.e. images downloaded from the net. Digital print can cope with images as low as 150DPI whereas a litho image at that resolution would look terrible and would need at least 300DPI to look as good. In this internet dominated age that's a pretty useful advantage.

## **Over the years has digital quality improved?**

Definitely, the key thing with digital technology and suppliers such as Xerox and Canon, is that they did actually manage to establish a very acceptable commercial quality about five or six years ago, but the focus since then has been all about speed without compromising the quality levels they had already achieved. It's been a bit of a race to build faster and faster machines to cope with the increased demand.

The digital manufacturers smelt blood five years ago with litho, and are actively chasing and attacking that market. Litho press manufacturers have responded by improving set up times etc but it's a case of too little, too late. You just can't get away from the fact that the basic litho press technology really hasn't changed for hundreds of years.

## **Any limitations digital wise?**

As discussed above there are still some limitations on the type of paper and card that can run on the digital machines. Litho on the other hand is not a heat process at all – as the name suggests it 'presses' the ink into the page without changing the basic paper properties.

One down side to printing letterheads digitally using a toner based machine is that in most cases the toner applied during the printing can re melt with the heat of a desk top laser printer which will obviously seriously damage the office printer. So letterheads, no matter what the quantity still have to be produced using litho presses.

## Can you achieve the same finishing options on a digital job compared to litho?

Digital jobs generally require different finishing techniques. This is due to the temperature the paper reaches during printing, and the way the toner is applied to the surface of the sheet, rather than 'in it' like a litho print.

So for example folding and scoring and therefore booklet making with digital print using litho finishing machines can certainly produce 'cracking' on the dried printed image. At First Colour we've invested in the latest digital finishing equipment, and in this example our digital scorers and folders are equipped with soft rubber blades that are 'gentle' with the digital print, and produce a 'crack' free end product.

Similarly, laminating a digital print has also produced challenges with existing equipment designed for the litho market. The old standard laminate didn't stick properly to the page, especially when there are large areas of a solid colour on the sheet. The laminate manufacturers after much research produced a 'low temperature melt' product that does in most case get around that problem.

## A glimpse into the future...

Because of the size and growth of the digital printing industry it's no surprise that this market is developing all the time. The next wave of digital machines in my personal view will be not be relying on any kind of heat process, so all stocks become available, including plastic, canvas etc etc.

This new breed will also have better control of colour than litho – a real switch over – and will match litho speeds easily. This could be happening within the next 5 years as you see companies such as HP and Xerox literally continue to pour hundreds of millions of dollars into R&D.

The result for us, and you the customer, will be one print technology that will cover all the criteria's with no confusing crossovers, better quality than even litho (HD) and almost certainly lower print costs.

## Have you started to see examples of these machines?

The two technologies that are emerging are highly advanced Inkjet Printing systems and Nanography.

For Inkjet it's true to say that historically this method has been held back by lack of speed and also proper control of the ink for consistency and colour when running at speed.

This all changed after Xerox started to acquire a few hi tech 'print head/nozzle' development companies. Now they are developing print heads that literally have thousands of ink nozzles – giving the printers full speed and brilliant control.





The real first commercial result of all that technology is the Xerox CiPress inkjet printer. It's a full blown commercial digital print machine that matches litho colour accuracy with effective speeds of 600+ A4's per minute. This machine produces 39,000 ink droplets per second from 50,000 nozzles, but at a price tag of £2m is unfortunately out of our reach at present.

The technology however is here to stay and it will most definitely eventually percolate down to our level within the next five years.

The second technology is every bit as exciting as the CiPress – it's a brand new technology called **Nanography** and was invented by the same individual – Benny Landa – an Israeli print entrepreneur - who introduced the Indigo Digital press about 10 years ago. (Now owned by HP).



Nanography promises to be a truly 'disruptive' new technology and has stimulated much discussion in the industry about its claimed advantages.

From the start Landa had Particle Physicists on his payroll which has paid off handsomely as he has indeed produced a new technology. It basically involves a special water-based ink with

'nano-pigment' particles that measure tens of nanometers in size. That's incredibly tiny.

It means that much more ink and consequently colour can be placed on the sheet as it goes through the press. This means a hugely extended colour range, high-gloss uniformity, a High Definition finish and no limits on paper or card stock.

The ultra-small NanoInk pigments (and their ability to form a very thin layer of ink) allow digital printing at very high speeds, easily matching the fastest litho machine on ordinary paper stocks (coated or uncoated) and on just about any plastic packaging film or label stock. Also, the final images are both abrasion-resistant and scratch-resistant.

But the **big news** is that this process combines the versatility and short-run economics of digital printing with the qualities and productivity of litho. The anticipated financial benefits will effectively be the lowest cost per page ever! Most people in our industry think that Nanography will be a game changer and will transform our industry.

The Nanographic Printing process offers the capacity to yield the lowest cost-per-page of all the digital printing technologies now on the market. This is truly revolutionary.

## In summary

### Advantages of Digital

#### **Shorter turnaround**

**Every print is identical** - and you get more accurate page counts and less waste.

**Lower cost short run printing** - Even though the unit of each sheet may be higher than with litho printing, if you take into account setup costs digital printing provides lower per sheet costs for those short runs.

**Variable Data Printing** – this is effectively a type of customisable digital printing. Different images and text can be placed on each page drawn from a database or external file. For example, leaflets can be printed with a different name and address on each one. Variable data printing is used mostly by the direct marketing industry, but is now available from most digital print businesses.

**Original Image Quality** - Digital print can be more forgiving when using low resolution graphics such as images from the net. It is capable of producing good quality print from images as low as 150dpi. But litho print needs at least 300dpi.

### Advantages of Litho

#### **Excellent image quality.**

**No stock restrictions** – is able to print onto an extremely large range of available paper and card stocks.

**Cost** - The unit cost goes down quickly as the quantity goes up.

**Quality and cost with higher volume jobs** - Modern digital presses are now coming pretty close to the cost/benefit ratio of litho for high quality work, but although not far off it they are not yet able to match the sheer volume a litho press can produce once running.

#### **Still Not Sure Which is Right? Use this checklist to help decide:**

**Quantity** - Litho printing has a significant set up cost. Short litho runs will have a high unit cost but as quantities increase, the unit cost goes down. Very short runs can be much more cost effective with digital printing; while higher volumes are likely to have a lower sheet cost with litho printing.

**Printing Stock** - Does your job require a special paper, finish or is it an odd size? The options are continually opening up in the digital printing world, but you still can't beat the flexibility litho printing offers.

**Weight of Stock** – The majority of digital machines have a maximum stock weight of 350gsm. Litho presses will print up to 400gsm – more on higher spec presses.

**Colour** - Digital presses either print in black & white or full colour. If you only need black or a couple of specific pantone colours litho printing will definitely produce a better representation of the specific colours and even a more cost-effective solution.

If you need full colour printing but with no specific single colours to hit, digital may offer advantages in lower up-front costs.

If you're printing using the Pantone® ink colour matching reference, litho printing will give you the most accurate match, as it uses actual Pantone® ink. Digital printing only simulates the colour range using a four-colour process, digital printers definitely at present offers less accurate matching.

**Turnaround** - If your job is needed quick – as most are! Digital is the no-brainer.

**Proofing** – A digital proof will be identical to the finished piece. To get accuracy like that for litho printing is very expensive and time consuming.

**Variable Data** - Digital print is really the only way to get bespoke customisation for marketing materials, one to one marketing and direct mail.



**Cliff Finn**  
**Managing Director**  
**First Colour Limited**

### **Have a print project and want to be sure you get best value for money (AND top quality printing too)?**

If you have a project coming up, or you just need a competitive quotation, simply call our Newman Street office on **0207 636 2571** and tell me what you are looking for and I'll give you my best advice and guidance, without obligation. I'll let you know where any opportunities lie to reduce costs, how to choose a paper stock that adds real impact and value to your job (for little or no extra cost), and I'll give you a delivery date that will make you smile!

If you decide to place any print work with us, you'll automatically be covered by the unique First Colour **100% Delight Guarantee** which simply means that if for any reason whatsoever you are not completely ~~happy~~ delighted by your experience with us, then we'll instantly refund your money, or re-print your job at zero cost (we've never ever had to do this!).

First Colour Limited  
15 Newman Street  
London  
W1T 1PA  
[www.firstcolour.com](http://www.firstcolour.com)  
Tel: 020 7636 2571  
westend@firstcolour.com

First Colour Limited  
51 Tothill Street  
London  
SW1H 9LQ  
[www.firstcolour.com](http://www.firstcolour.com)  
Tel: 020 7799 2313  
westminster@firstcolour.com

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