



The lower cost of laser printers has brought them within the financial reach of home users. We test nine of the latest models whose reasonable price makes them a viable alternative to inkjets

Lasers for less

Ten years ago, a personal printer had nine pins and produced prints whose abominable quality was matched only by the amount of noise and time they took to produce them. If you didn't fancy a corner of your desk rattling away to the sound of the then-ubiquitous dot-matrix printer, the only alternative was a laser printer, but these were priced beyond the reach of most users.

These days, the inkjet printer has all but extinguished the dot-matrix as a cheap way to get hard copy from a PC. The inkjet's position, however, is now threatened by the emergence of cheap, personal laser printers offering extremely high-quality output.

So what makes a laser printer 'personal'? The main thing is price and around £500 is a sufficient budget to give you plenty of products to choose from. A personal laser printer is also small and should be easily capable of sitting on a corner of a desk without causing it to lean at a worrying angle. This month, we've put nine personal laser printers through their paces...



Brother HL-760

It's unlikely that any piece of computer equipment is going to win an award for its looks, but the HL-760 might be in with a chance should Brother decide to put it before the Design Council. Its smooth curves and menacing forward tilt make it look like some kind of futuristic hotrod inkjet printer and the only minus point is that it's perhaps a little large for some desks.

Paper is loaded into a tray jutting from the rear of the HL-760 and there is a separate single-sheet slot so that one-off different paper sizes can be printed without too much effort. Printed pages can drop onto the desk from a slot at the front of the HL-760, but there is also a cunning fold-out panel that acts as a paper tray.

The HL-760 churns out pages very quickly, even at 600dpi (dots per inch) and text quality is extremely good. Characters are sharply defined with crisp edges and no discernible jaggedness. Graphics don't come out so well – contrast is good but there is an overall lack of clarity and, although



the printer is capable of 1,200x600dpi, graphics oddly look better at 600x600dpi.

The Brother HL-760 produces pages quickly enough but its poor graphics quality makes it more suited for pages of text and the occasional picture. It's pricey compared to some printers but the consumables are at least cheap.

○ £468.83 (inc VAT)
○ Brother: 0161 330 6531

Brother HL-760

| | |
|-----------------|-------|
| Build quality | ★★★★★ |
| Performance | ★★★★★ |
| Print quality | ★★★☆☆ |
| Value for money | ★★★★☆ |
| Overall | ★★★★★ |

Canon LBP-465

Although bulky, the Canon LBP-465 is at least compact but its footprint is deceptive as Canon recommends that ample clearance is left around the printer to allow for air circulation. At 7kg, it's also on the



weighty side but this at least means that it's going to be difficult to accidentally push it off the desk.

Paper is loaded into the feeder on top of the LBP-465 and printed pages emerge from a slot at the front. There isn't a paper tray of any kind but a small plastic flap clips onto the slot to act as a 'paper exit guide'. The flap doesn't appear to do anything and since it detaches all too easily, it's probably best left in the box.

In use, the LBP-465 is extremely quiet with the most noise coming from the printed pages sliding across the desktop. With or without the 'Automatic Image Refinement' (which is claimed to boost prints to 2,400x600dpi), text quality is extremely impressive. Letters are crisply defined and readable all the way down to two points. Graphics with areas of even shade fare just as well with sharp edges and smooth shading but photographic prints do lack a little contrast.

Pin-sharp text and acceptable graphics make the Canon LBP-465 an ideal all-rounder but although it's



attractively priced, the comparatively high cost of replacing the toner unit is a little off-putting.

- £374.83 (inc VAT)
- Canon: 0121 680 8062

Canon LBP-465

| | |
|-----------------|-------|
| Build quality | ★★★★★ |
| Performance | ★★★★★ |
| Print quality | ★★★★★ |
| Value for money | ★★★★★ |
| Overall | ★★★★★ |

claimed 6ppm (pages per minute) and the print quality is nothing to shout about either.

- £387.75 (inc VAT)
- Epson: 0800 289622

Epson EPL-5500W

| | |
|-----------------|-------|
| Build quality | ★★★★★ |
| Performance | ★★★★★ |
| Print quality | ★★★★★ |
| Value for money | ★★★★★ |
| Overall | ★★★★★ |



Hewlett-Packard LaserJet 5L

Hewlett-Packard is one of the heavyweights in the laser printer industry and it seems to be trying to put this fact across with the LaserJet 5L. Not only does it have one of the largest footprints of the printers tested but, at 7.1kg, its weight is beaten only by the hefty Kyocera FS-400.

Paper loads

into a slot at the rear of the LaserJet 5L and stands almost upright, incidentally making the LaserJet 5L the tallest printer here. There's a separate slot for envelopes and printed pages are deposited face down and upright in a large slot at the front of the printer or, if a small lever is flicked, face up through a slot at the bottom (making for a gentler paper-path).

Print quality of the LaserJet 5L is very, very good. Text output is pin-sharp with no discernible stepping on the edges of characters even under magnification. Graphics quality is also superb and with the possible exception of the QMS

DeskLaser 600, the LaserJet 5L is streets ahead of the other printers when it comes to output.

As you would expect from a Hewlett-Packard product, the LaserJet 5L is a strong contender in the personal laser printer stakes. Both text and graphics quality are outstanding but you're in for a shock when the time comes to replace the developing drum.

- £440.63 (inc VAT)
- Hewlett-Packard: 0990 474747

Hewlett-Packard LaserJet 5L

| | |
|-----------------|-------|
| Build quality | ★★★★★ |
| Performance | ★★★★★ |
| Print quality | ★★★★★ |
| Value for money | ★★★★★ |
| Overall | ★★★★★ |

Kyocera FS-400

The Kyocera FS-400 is the only laser printer in this group test that couldn't be mistaken for something else. It eschews sleek design and clever mechanisms in favour of good old-fashioned laser printer looks. As a result, the FS-400 is one

Epson EPL-5500W

In contrast to some of the sleeker laser printers in the group test, the Epson EPL-5500W's stark appearance makes it look positively utilitarian. The overall impression is that a normal-size model has been sawn in half to give a more compact shape. Compact, that is, until you want to use it, for once the EPL-5500W's paper input and output trays have been folded out into position, the printer's footprint is effectively doubled.

According to the manual, once the printer has been properly set up, the EPL-5500W's power LED should glow yellow, indicating that the printer is ready for use. In reality, switching on the printer caused a warning LED to glow red. At least we presume it was a warning as the manual makes no mention of this LED at all. Having exhausted all the other options, we pressed on, installed the drivers and tried printing a test page. One successful print later, the power LED glowed green.

Text quality of the EPL-5500W is good but by no means the best. Letters are well defined but jagged edges are visible on close inspection. Graphics quality was worse, with prints having uneven shading and an overall lack of clarity.

The Epson EPL-5500W isn't the fastest printer around, producing well below the



of the least attractive printers of the bunch, what with its plethora of stylistic grooves, bright buttons and LCD status display.

Like some of the other printers, the FS-400's size is deceptive. Paper is loaded into a cassette that slots under the bottom of the printer and a good foot or so needs to be left clear at the front for this. Printed pages drop face-down into a tray on top of the printer but can be sent face-up through a slot at the rear.

The FS-400 is the noisiest printer of the bunch and at times sounded like it was making the paper as well as printing it. Unfortunately, the 300dpi resolution looks a little dated and although resolution enhancement (giving 300x1,200dpi prints) gives satisfactory text from around ▶

The Windows Printing System

Traditionally, a laser printer prints a page in the following way. First, the layout of pixels that comprise the image on the PC's screen are converted into a series of instructions in a Page Description Language that the printer understands. The instructions are then sent to the printer, which processes them and builds up an image to be printed onto a page.

For a page of text, the instructions require little processing. For a detailed graphic or complex page layout, however, the processing required is significant and for a laser printer to be able to produce pages in a reasonable time, it needs lots of processing power and memory. This translates to an expensive and complex printer whose price can only be brought down by reducing its functionality.

One way around this is to get the PC to do most of the processing of a page before giving it to a printer. Modern PCs are powerful enough to do this and it leads to simpler, cheaper laser printers. GDI laser printers work this way but it wasn't until Microsoft came up with the Windows Printing System that laser printers really dropped in price.

Not only does the Windows Printing System take much of the workload off the printer and put it on the PC (leading to simpler, cheaper printers), but it also allows much more feedback for the user. Gone are the days when hitting 'print' resulted in a flashing red light on the printer and no printing; the Windows Printing System will instead display a message informing you 'the printer is out of paper'.

eight points and above, there are still some rough edges in evidence. A resolution of 300dpi isn't really up to showing graphics at their best either and prints simply lacked detail and clarity.

The Kyocera's text quality is pleasant enough but 300dpi just doesn't cut it when it comes to graphics. When you consider that it's also the most expensive model in this group test, you end up with a printer that has been left behind by the competition.

- £515.83 (inc VAT)
- Kyocera: 01734 230700

Kyocera FS-400

| | |
|-----------------|-----------|
| Build quality | ★ ★ ★ ★ ★ |
| Performance | ★ ★ ★ ★ ★ |
| Print quality | ★ ★ ★ ★ ★ |
| Value for money | ★ ★ ★ ★ ★ |
| Overall | ★ ★ ★ ★ ★ |

Lexmark Optra E

On looks alone, the Lexmark Optra E is right down there with the

Kyocera FS-400 machine. Not that it isn't compact – with everything tucked away, the Optra E occupies less desk space than that taken up by a typical keyboard. It does, however, lack style in a major way – its appearance is by no means one of leading-edge design.

Paper is loaded into a fold-out tray at the bottom of the printer and printed pages emerge into another fold-out tray just above it. The system is a little ungainly but it works and the trays can be folded away when not in use. Not being a Windows Printing System printer (see *the box above*), the Optra E also has a row of colourful status LEDs on a control panel, together with a big blue button marked 'reset'.

Thankfully, the Optra E's unprepossessing exterior isn't a reflection on its performance. Print speed is swift and the 600dpi text is very sharp and remains readable down to small point sizes. There is some stepping around the edges of certain characters but this is imperceptible to the naked eye. The Optra E is also up to scratch when it comes to printing graphics, producing clear and well-defined prints with sharp contrast.

The Lexmark Optra E isn't going to win any beauty contests but its performance is thankfully up to scratch. A respectable performer at a reasonable price.

- £481.75 (inc VAT)
- Lexmark: 01628 481500

Lexmark Optra E

| | |
|-----------------|-----------|
| Build quality | ★ ★ ★ ★ ★ |
| Performance | ★ ★ ★ ★ ★ |
| Print quality | ★ ★ ★ ★ ★ |
| Value for money | ★ ★ ★ ★ ★ |
| Overall | ★ ★ ★ ★ ★ |

Oki Okipage 4w

If the Kyocera FS-400 looks like half a laser printer, then the Oki Okipage 4w looks like a quarter of one. With a footprint barely larger than that of the pages it prints, the Okipage 4w makes an almost unnoticeable addition to any desktop. Indeed, were it not for the perils inherent in transporting laser printers, the 4w would be small and light enough to be used portably.

The hinged front panel doesn't provide a great deal of room to get at the 4w's insides and has an irritating tendency to flop down at inopportune moments. Fortunately, fitting the small toner cartridge (which is separate from the developing drum) is a swift business and not hindered too much by the soggy hinges. A 100-sheet paper tray clips to the back of the printer, adding little to its required desktop area and printed pages are rolled through 180 degrees to emerge face up back where they started. There's also a paper feed slot at the front of the printer for such things as envelopes, where a flatter paper-path is required.

Despite its small size, the 4w still manages to pack a punch when it comes to performance. Characters are crisply formed although there is some faint crinkling to their edges at larger point sizes. Graphics compare favourably too, being clear with sharp detail but photographic prints are let down by banding across the page.

The Oki Okipage 4w satisfies both the size and

price criteria for a personal laser printer and it produces great prints to boot. At 1,000 pages a go, the toner cartridge isn't the longest-lasting but at less than £20 a replacement, who cares?

- £279 (inc VAT)
- Oki: 01753 819819

Oki Okipage 4w

| | |
|-----------------|-----------|
| Build quality | ★ ★ ★ ★ ★ |
| Performance | ★ ★ ★ ★ ★ |
| Print quality | ★ ★ ★ ★ ★ |
| Value for money | ★ ★ ★ ★ ★ |
| Overall | ★ ★ ★ ★ ★ |

QMS DeskLaser 600

The laser printers in this group test can be firmly divided into two groups – those that look like a laser printer and those that don't. Like the Brother HL-760, the QMS DeskLaser 600 could easily be mistaken for a chunky inkjet by the unsuspecting. For a laser printer, however, it is thankfully compact and the 'desk' part of its name can be taken to mean the one you sit at rather than one of its own.

Typically for a Windows Printing System printer, there isn't much in the way of adornment or 'the



DeskLaser 600. Two status LEDs decorate its left-hand side and apart from the power switch at the back, that's it for controls as everything else is handled through software. Up to 100 sheets of paper can be loaded into the paper tray at the top of the printer and printed pages emerge face-down from a slot at the front. For a short while after printing, the DeskLaser 600 emits a steady stream of warm air. It's not going to double as a hair-dryer but the temperature is sufficient to warrant placing the printer out of the way unless, of course, you're in a particularly chilly room.

Print quality of the DeskLaser

600 is very good indeed. Characters are sharp and black with smooth edges that have almost no detectable stepping. Graphics quality is within a whisker of the pricier LaserJet 5L and photographic prints actually have the edge when it comes to the crispness of the image. The only weakness is that the DeskLaser 600's dot placement isn't quite as exact as the LaserJet 5L's and this leads to some undesirable patterning with certain shades of grey.

The QMS DeskLaser 600 manages to combine everything you would want from a laser printer into a small package at a great price. The claimed print speed is on the optimistic side but the dazzling print quality more than makes up for this.

- £287.88 (inc VAT)
- QMS: 01784 442255

QMS DeskLaser 600

| | |
|-----------------|-----------|
| Build quality | ★ ★ ★ ★ ★ |
| Performance | ★ ★ ★ ★ ★ |
| Print quality | ★ ★ ★ ★ ★ |
| Value for money | ★ ★ ★ ★ ★ |
| Overall | ★ ★ ★ ★ ★ |

Sharp JX-9210

Although the Sharp JX-9210 has a footprint only a little larger than that of the Okipage 4w, its design is much less compact, making it appear larger than it actually is. It's still one of the smallest models tested here, though. Paper is loaded into a large slot at the rear of the JX-9210 and two arms fold out antennae-like to support pages. Printed sheets pass through a gentle 180-degree loop before appearing face-down in a slot at the front of the printer.



As seems to be the norm with printers that use the Windows Printing System, the JX-9210 dispenses with buttons to control its various operations and relies instead upon the PC and supplied software. Start a print and not only are you verbally informed of the fact, but the estimated time to the print's completion is also given.

Text quality of the JX-9210 is good but character edges do show some unevenness under magnification. Smaller point sizes of text (from about eight and below) also lack a little definition and have marked white areas where the toner hasn't fully transferred to the paper. Graphics are a bit of a mixed bag – overall quality is acceptable but photographic prints lack contrast and come up short on detail.

Unfortunately for the Sharp JX-9210, although a reasonable price is a desirable feature, merely reasonable performance isn't such a selling point. A case of 'could do better'.

- £351.33 (inc VAT)
- Sharp: 0800 262958

Sharp JX-9210

| | |
|-----------------|-----------|
| Build quality | ★ ★ ★ ★ ★ |
| Performance | ★ ★ ★ ★ ★ |
| Print quality | ★ ★ ★ ★ ★ |
| Value for money | ★ ★ ★ ★ ★ |
| Overall | ★ ★ ★ ★ ★ |

Laser vs inkjet

A few years ago, if you wanted the best attainable print quality from your desktop PC, a laser printer was the only realistic choice. Inkjet printers changed that by offering the same high-resolution printouts at a much lower cost. However, don't be fooled into thinking the output from an inkjet printer with a resolution of 600x600dpi (dots per inch) is as good as that from a laser printer with the same resolution.

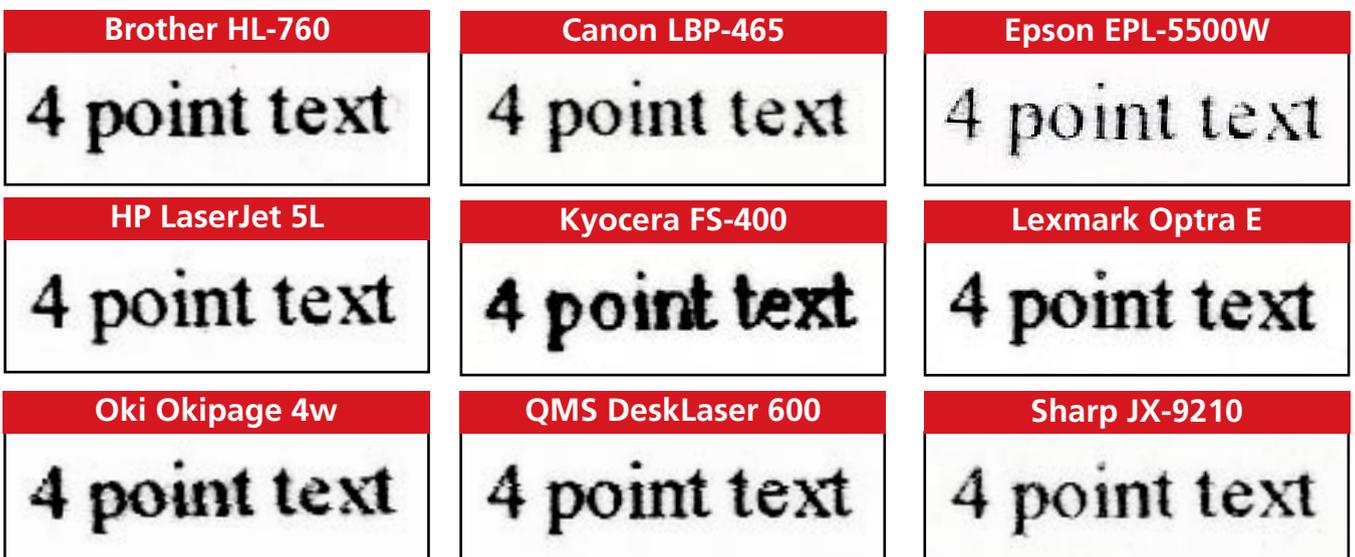
Both inkjet and laser printers create images on paper by placing tiny dots of ink or toner in very close proximity. A printer with a 600x600dpi resolution, therefore, will place 360,000 dots in a 1x1-inch square of paper. The difference between a laser printer and an inkjet device is in the accuracy of dot placement. Laser printers have a much finer control over where the dots go, resulting in smoother-edged images and sharper text – the same is true of the new breed of LED (light-emitting diode) printers.

Graphics print samples



The above graphics print samples are shown magnified approximately three times their original size.

Text print samples



The above text print samples show four-point text printed by each printer, magnified approximately six times. ▶

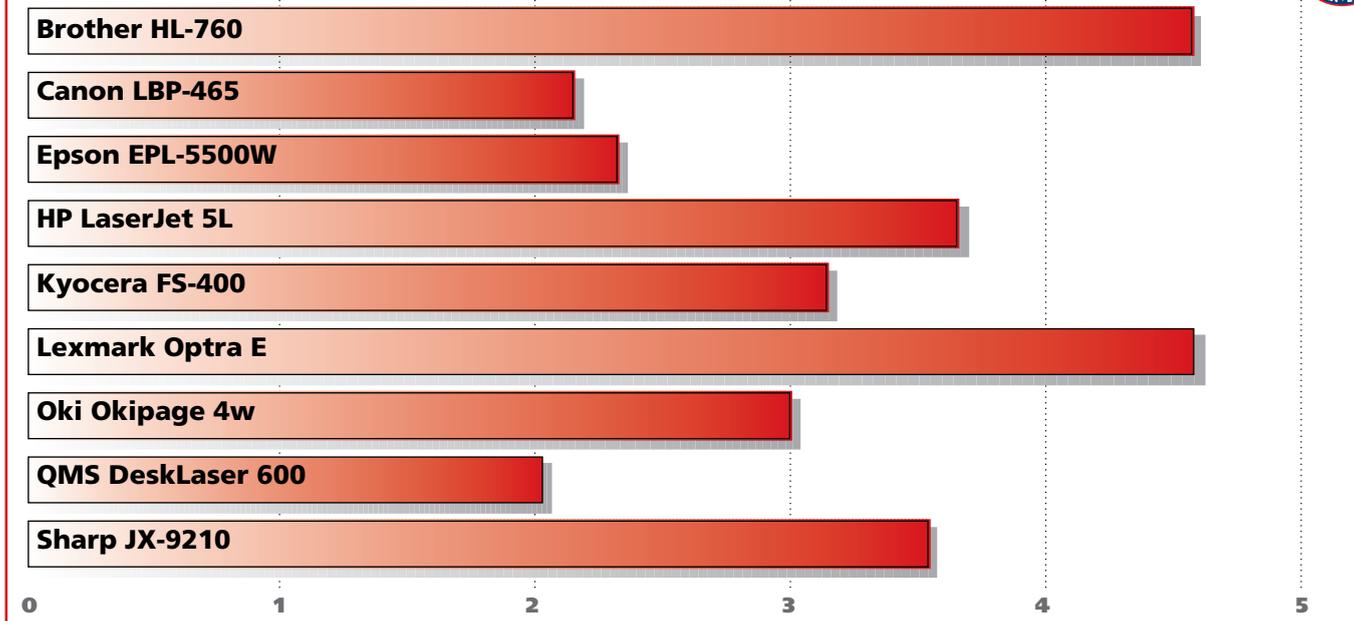


Personal laser printers compared

| Name | Brother HL-760 | Canon LBP-465 | Epson EPL-5500W | Hewlett-Packard LaserJet 5L | Kyocera FS-400 | Lexmark Optra E | Oki Okipage 4w | QMS DeskLaser 600 | Sharp JX-9210 |
|-------------------------------|---------------------|---------------------|---------------------|-----------------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
| Type | Laser | WPS/Laser | WPS/Laser | Laser | LED | Laser | WPS/LED | WPS/Laser | WPS/Laser |
| Maximum resolution | 600dpi | 600dpi | 600dpi | 600dpi | 300dpi | 600dpi | 600dpi | 600dpi | 600dpi |
| Claimed maximum print speed | 6ppm | 4ppm | 6ppm | 4ppm | 4ppm | 6ppm | 4ppm | 6ppm | 4ppm |
| Average tested print speed | 4.56ppm | 2.14ppm | 2.31ppm | 3.64ppm | 3.13ppm | 4.57ppm | 3.00ppm | 2.02ppm | 3.50ppm |
| Time to first print (seconds) | 63 | 88 | 83 | 52 | 69 | 75 | 52 | 62 | 91 |
| Paper capacity (A4) | 200 | 100 | 150 | 100 | 100 | 150 | 100 | 100 | 100 |
| Memory | 1Mb | n/a | 0.52Mb | 1Mb | 1Mb | 1Mb | n/a | 1Mb | 0.5Mb |
| Estimated toner life (pages) | 2,200 @ 5% coverage | 2,500 @ 5% coverage | 3,000 @ 5% coverage | 2,500 @ 5% coverage | 1,500 @ 5% coverage | 3,000 @ 5% coverage | 1,000 @ 5% coverage | 3,000 @ 5% coverage | 2,000 @ 4% coverage |
| Separate drum/toner? | ● | ○ | ● | ● | ● | ● | ● | ○ | ● |
| Toner cost | £22.91 | £70.50 | £52.88 | £25.85 | £18.74 | £48.35 | £19.98 | £76.38 | £49.35 |
| Drum cost | £129.25 | n/a | £59.93 | £319.60 | Drum not replaceable | £68.33 | £104.58 | n/a | £66.98 |
| Dimensions (wxhxd) mm | 366x250x383 | 336x319x249 | 352x217x407 | 336x228x312 | 353x173x350 | 348x219x246 | 310x150x191 | 320x306x146 | 299x291x185 |
| Weight | 7kg | 7kg | 5kg | 7.1kg | 7.5kg | 5kg without toner | 3.8kg | 6kg | 4.5kg |

● = Yes ○ = No

Pages per minute (tested)



Of the nine printers reviewed here, two or three stand out as likely candidates for a good personal laser printer. One, however, stands out as excellent and that's the QMS DeskLaser 600. Cheap, compact yet with a print quality that would put some printers costing twice as much to shame, the DeskLaser 600 is excellent value. Its only

real failing is its slow page production and our tested 2ppm (pages per minute) is well below the claimed six. For a personal printer though, this is hardly a major criticism.



Like the DeskLaser 600, the Okipage 4w offers respectable performance in a neat package. It's actually a little cheaper but pays for this

with inferior print quality. The running costs are low too, with the 1,000 page toner unit coming in at just under £20.

If print quality is your main concern and price a not-too-close second, then the Hewlett-Packard LaserJet 5L is the personal laser printer to go for. Actually, for £440, it's not even that expensive but the prints it produces really are second to none.

Julian Prokaza