Look good on paper

After buying a PC, a printer is probably next on your shopping list. And for quick, quality printing you could opt for a laser model – many are now priced to be within the reach of home or small office users. We scouted around to see what you might find

Unless you've bought your PC purely for the purpose of playing games you will, sooner or later, find yourself wanting to print. When it comes to actually buying a printer, though, you will find that there's a dazzling array of shapes, sizes and manufacturers available for you to choose from.

If that wasn't mind-boggling enough, there's also a variety of different printing methods, and each of these methods has its pros and cons: dot-matrix printers are cheap but produce lower-quality output; inkjet printers generally give excellent-quality printouts, but they tend to be quite slow; laser and LED machines – page printers – combine quality and speed, but at a higher price.

As with all things electronic, the prices of printers seem to be in a continuous downward spiral while minimum specifications increase. You can now buy a 'personal' laser or LED printer for little more than you would have paid for an inkjet device just a few years ago.

In this roundup we've trained our sights upon several LED and laser-based page printers that won't burn a hole in your pocket – and the odd one or two that might just leave scorch marks.

Brother HL-730

This has a sleek design with a cover that swings forward and down to form the paper catch tray; when raised to access the toner cartridge this cover feels a little unsteady. Installing the two-piece toner cartridge and drum is very easy, primarily because Brother has built a pair of small handles onto the drum unit. Toward the rear of the HL-730 is a vertical paper hopper that can take up to 200 sheets of A4 paper, or ten envelopes. In front of this sits a slot through which you can feed a single sheet of paper. This is useful if, for example, you print primarily on plain paper but occasionally need to print on a sheet of headed paper.
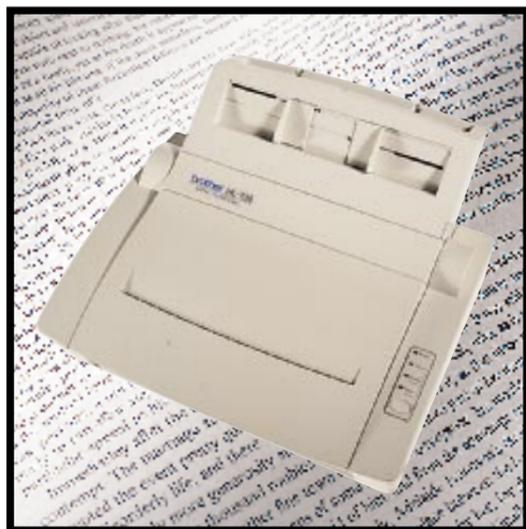
The HL-730 has one control button and this is only used for performing test prints – all other controls are accessible via the included Windows driver.

We found the quality of printed text to be superlative, and the HL-730 outshone all the other machines with its results from our graphics test. Brother claims a print speed of 6ppm (pages per minute) and this proved quite accurate.

A word of warning: Brother has only fitted 0.5Mb of memory in the HL-730. This may not be enough if you're intending to print complex documents or graphics.

A very appealing machine, combining high quality, ease of use and a low price.
○ £433.58 (incl VAT)
○ Brother: 0161 330 6531

Brother HL-730

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

Minimum requirements: 486SX, 4Mb of RAM (8Mb recommended), 10Mb of free hard disk space, Windows 95/3.12x.

Canon LPB460

It's hard not to wonder if Canon's designers were in a humorous mood when they drew up the blueprint for this. Apart from the bulky look of the unit as a whole, the LBP460's front cover has a series of slats making it resemble the bonnet of a boy racer's souped-up car. Under this 'bonnet' is an awkward-to-fit-and-remove toner cartridge.

The LBP460 employs the Windows Printing System (WPS). The printer does not have, or need, any controls of its own. WPS printers need to possess little memory or processing power: the PC does the bulk of the hard work of calculating how each page should appear, and stores it until the printer is ready to receive it. When the printer is ready, the PC sends the image in small bands, rather than as a full page.

Both text and graphics printing produced print speeds of around 3ppm, with a 34-second wait for the first page to appear. There is no warm-up time as such – as soon as Windows receives a command to print, the WPS software takes control until the printer is actually ready to print. We found the quality of text to be of a good standard, but the graphics output we looked at was really quite poor.

Canon produces some outstanding printers but the LBP460 is not one of them. Used for text printing it is fine, but its graphics output leaves a lot to be desired.
○ £351.33 (incl VAT)
○ Canon: 0121 680 8062

Canon LPB460

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

Minimum requirements: 386, 4Mb of RAM (8Mb recommended) 4Mb of free hard disk space, Windows 95/3.1x.

Epson EPL5500W

The name Epson is synonymous with printers. Since the days of the earliest dot-matrix machines, Epson has been producing printers to suit all needs. According to Epson, the EPL5500W – its latest model – is the world's first true 600x600dpi Windows Printing System laser printer.

Although not overly pleasing aesthetically, the EPL5500W's design is small and tidy. Unfortunately, the enthusiasm created by its compactness does not last long – the front of the machine flips down to form the paper feeder, meaning the EPL5500W's footprint is a lot larger than most. This feeder has a capacity of 150 A4 sheets, and there's also a single-sheet feeder located just above it.

Like many others in this test, the EPL5500W uses the Windows Printing System so it doesn't have any control buttons. We did notice that Epson's WPS driver tended to work somewhat slower than most in the page preparation stage of printing.
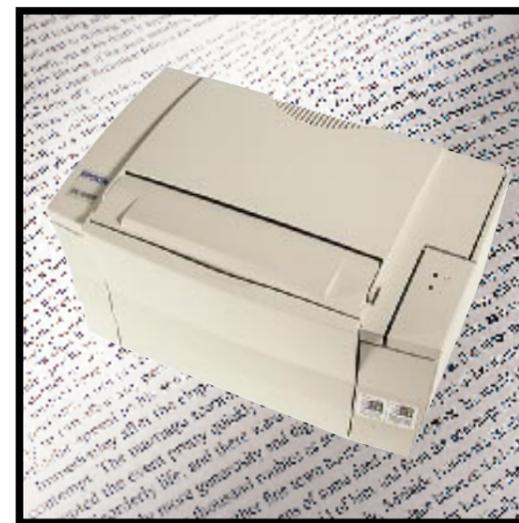
On average, the EPL5500W produced a little over 4ppm when printing text, and over 2ppm when dealing with our graphics test document. Quality of text printing was superb, although graphics printing was not quite as remarkable. **The EPL5500W is a good all-rounder. Its graphics output is reasonable, and text prints are quite superb.**
○ £475.88 (incl VAT)
○ Epson: 01442 61144

Epson EPL5500W

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

Minimum requirements: 386, 4Mb of RAM, 9Mb of free hard disk space, Windows 95/3.1x.

Fujitsu Print Partner 10

This weighs 17kg and gobbles up more than its fair share of desk space. That said, we could not find any fault with the quality of build – the Print Partner 10 is an extremely solid machine and it has obviously been designed to cope with heavy workloads.

The Print Partner 10 has a slide-out paper cassette underneath it, and this can take up to 250 sheets of A4. By attaching an optional second cassette the capacity rises to 750. Above the main cassette is a

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 all that by offering the same high-resolution printouts at a much lower cost. However, don't be fooled into thinking that the output from an inkjet printer with a resolution of 600x600dpi is as good as that from a laser printer with the same resolution.

Both inkjet printers 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 – and the same is true of the new breed of LED (light-emitting diode) printers.
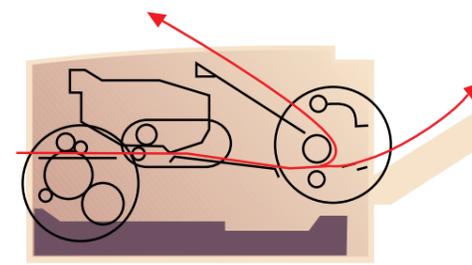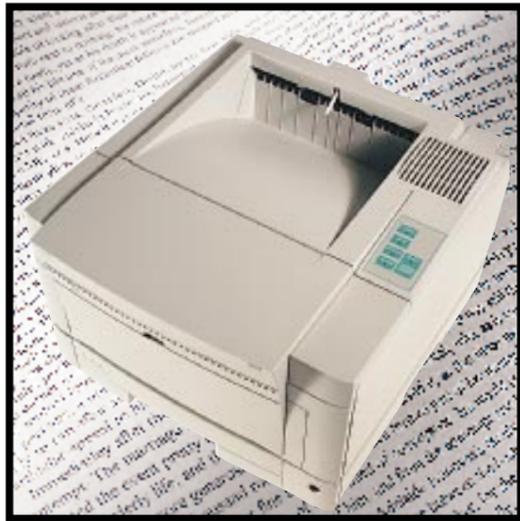
Printer emulations

For many years, laser printers used PostScript or PCL – which are page description languages (PDLs) – for printing. Printers that can deal with PDLs need some memory of their own in order to store page images before printing. As such, there is no minimum amount of memory necessary for printing on a PDL printer – some PDL printers have as little as 0.5Mb as standard – but the more memory a printer has, the greater the image complexity it can handle. As a general rule, you'll need a printer with at least 1Mb for printing at 300dpi – and you can at least double this amount for 600dpi output.

None of this applies to GDI (Graphics Device Interface) printers, or printers which are operated through the Windows Printing System (WPS). There are several technical differences between these two systems but, in essence, they both do the same thing: shift the burden of image processing and storage from the printer and onto the computer to which it is attached.

slot through which you can feed single sheets or envelopes. Only one control button is present on the case, and this is used to toggle 'ready' status.

This was by far the fastest printer in the group test. The page output pile rose by around nine pages every minute using our text document. Graphics printing was slightly slower, though, at just under 7ppm. The quality of text was excellent, and the graphics prints were among the best produced by any of the printers.

The Print Partner 10 is an expensive machine, and it is probably not aimed at the home user. However, if you can afford it, you will not be disappointed.
○ £821.33 (incl VAT)
○ Fujitsu: 0181 573 4444

Fujitsu Print Partner 10
Build quality	★ ★ ★ ★ ★
Performance	★ ★ ★ ★ ★
Print quality	★ ★ ★ ★ ★
Value for money	★ ★ ★ ★ ☆
Overall	★ ★ ★ ★ ★

Minimum requirements: none specified.

Hewlett-Packard LasjerJet 5L

The LaserJet 5L wouldn't look out of place on the set of a sci-fi movie: it looks quite futuristic, with flowing curves and a couple of paper supports that disappear completely into the casing when not in use. The front of the case can be pulled forward – rather shakily – when you need to remove jammed paper or replace the toner cartridge.

Both the paper feeder and the paper output tray stand vertically, which means the LaserJet 5L takes up less room on your desk than most. However, if you prefer your paper to exit at the front this can be achieved by simply flicking a switch.

Text prints were about average,

although there was noticeable speckling on the white areas of the pages. However, this may well have been caused by the battered-looking toner cartridge that we received with our review machine. The LaserJet 5L performed very well with our graphics test, though, producing crisp images with exceptional shading contrasts. Unfortunately, it's not particularly fast, marginally bettering Canon's LBP460's 3ppm.

Outstanding graphics output, acceptable text prints and an interesting design; our gripes with the LaserJet 5L are the slightly suspect build quality and its price.
○ £527.58 (incl VAT)
○ Hewlett-Packard: 0990 474747

Hewlett-Packard LaserJet 5L
Build quality	★ ★ ★ ☆ ☆
Performance	★ ★ ★ ★ ☆
Print quality	★ ★ ★ ★ ★
Value for money	★ ★ ★ ★ ☆
Overall	★ ★ ★ ☆ ☆

Minimum requirements: none specified.
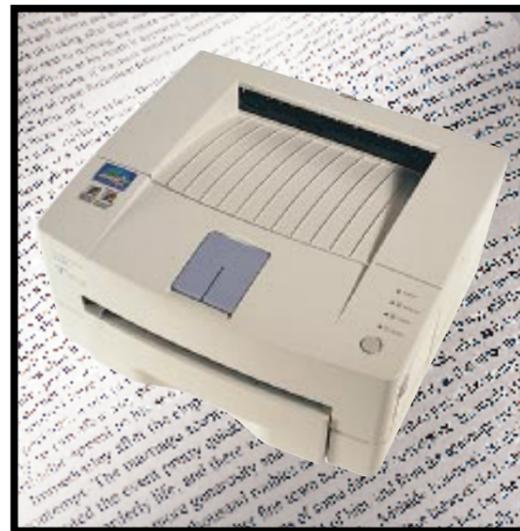
Mannesmann Tally T9108

The T9108 looks very smart indeed. It's not as compact as some of the other printers, but this is more than made up for by the sturdy feel. Also, the T9108 has a 'proper' slide-out paper cassette which can accommodate up to 150 sheets of paper.

Pressing a button located on the right-hand side pops open the T9108's cover revealing the toner cartridge, which is extremely easy to remove and replace, offering absolutely no resistance upon insertion.

The T9108 is yet another machine that uses the Windows Printing System, and it can also deal with pages sent in PCL4.5. It was quite fast at printing text pages, around 7ppm, although it didn't cope as well with our graphics test, managing a rate of 4.3ppm. The quality of both text and graphics was reasonable, although on closer inspection the graphics did appear rather 'dotty'. For a laser, the T9108 was surprisingly noisy.

The T9108 is fairly fast at printing text, but the quality

Brother

Canon

Epson

Fujitsu

Hewlett-Packard

Kyocera

Mannesmann Tally

Oki

Panasonic

Xerox

Text speed in secs
- Brother
- Canon
- Epson
- Fujitsu
- HP
- Kyocera
- Mannesmann Tally
- Oki
- Panasonic
- Xerox

Graphics speed in secs
- Brother
- Canon
- Epson
- Fujitsu
- HP
- Kyocera
- Mannesmann Tally
- Oki
- Panasonic
- Xerox
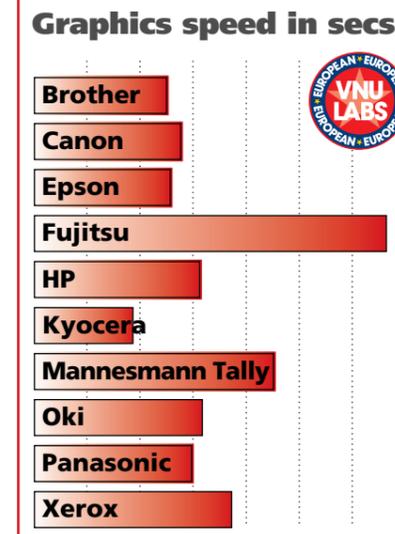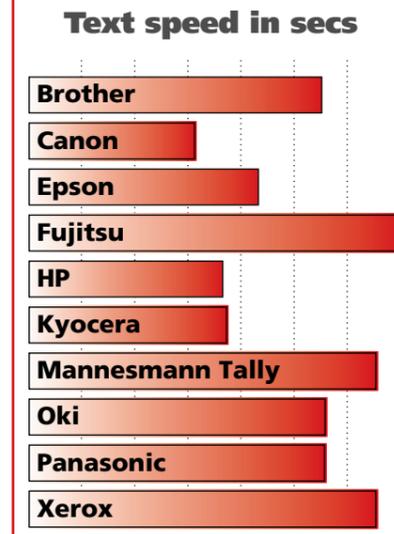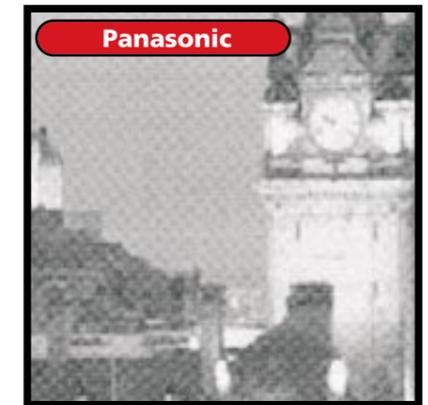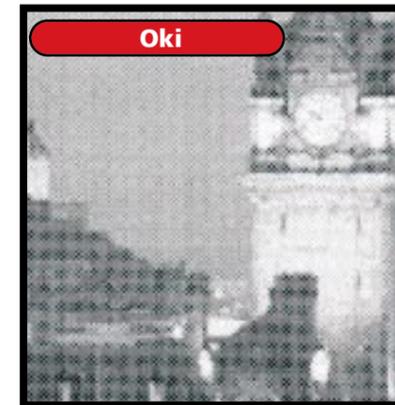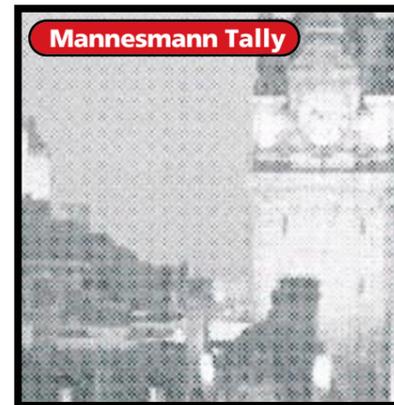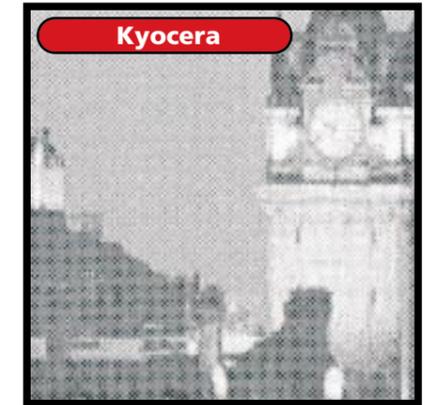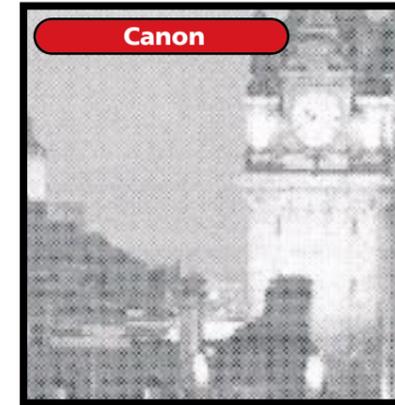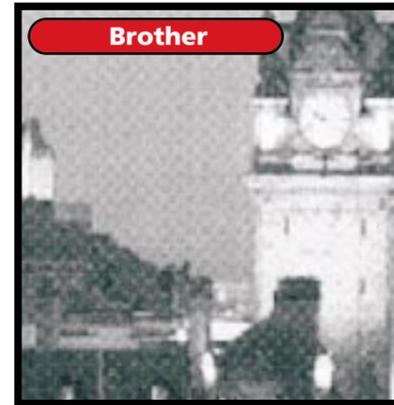
VNU LABS

NOTES: NSTL benchmarks from which this chart was generated were performed in the *What PC?* VNU labs. In all tests, a longer bar indicates better system performance.

of output could hardly be described as remarkable.
○ £527.58 (incl VAT)
○ Mannesmann Tally: 01734 788711

Mannesmann Tally T9108

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

Minimum requirements: none specified.

Oki OL600EX

Oki has opted for an exceptionally flat design with the OL600EX: it measures just 16cm from head to toe. Unfortunately, all the mechanics of a printer have to go somewhere, and this means that the machine stretches back some 36cm – even further if you choose to use the rear paper exit path.

The OL600EX is not a laser printer. It uses a row of LEDs (light-emitting diodes) – as opposed to a laser beam – to build up the page image. This actually makes very little difference in operation, and the OL600EX boasts a resolution of 600dpi – as high as any laser at the same price level.

In operation the OL600EX is very quiet, the only noticeable noise being when each page is drawn into the print mechanism.

Both graphics and text output from the OL600EX were very good, and it managed to come very close to Oki's quoted print speed of 6ppm during out text test. Graphics printing was slower at 3.1ppm, but
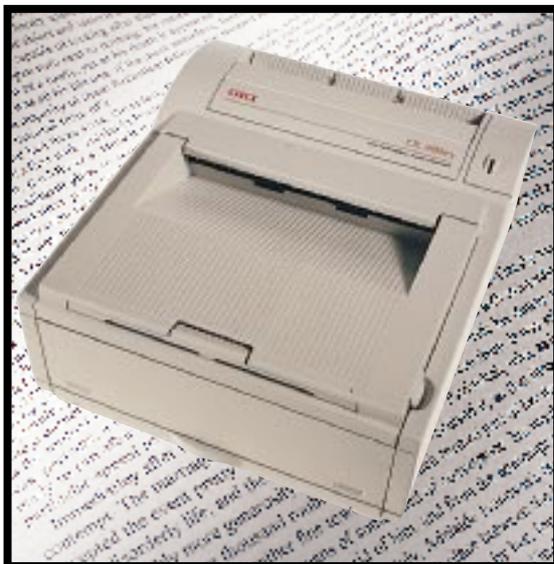
there was only a 31-second wait for the first page to appear. **This produces quality output, is reasonably fast and exceptionally quiet. The price is just a little too high for an unreserved recommendation.**
○ £492.33 (incl VAT)
○ Oki: 01753 819819

Oki OL600EX

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

Minimum requirements: 386SX33, 4Mb of RAM (8Mb recommended), 5Mb of free hard disk space, Windows 95/3.1x.

Panasonic KX-P6500

The Panasonic KX-P6500 is unique amongst the printers reviewed here in that it stands vertically on your desk. It also has another slight difference: the KX-P6500 is a GDI (Graphics Device Interface) printer. Unlike traditional laser printers, GDI printers perform no processing of information received. They are, essentially, dumb. Much like printers that use the Windows Printing System, the computer is left to prepare the page in readiness for printing.

When you first place the KX-P6500 on a desk it appears to take up a very small amount of space. However, when you pull down the paper feeder you realise this machine requires just as much space as most

laser printers. Also – although this is a very minor annoyance – replacing the toner cartridge is awkward because you need to steady the printer with one hand while inserting the cartridge with the other.

The KX-P6500's maximum true resolution is 600dpi, though this can effectively be doubled using Panasonic's Edge Enhancement Technology (EET). Text output is above average. Graphics prints were also good but there was evidence of what can only be described as banding. **A good machine that is reasonably priced considering its effective resolution of 1,200dpi.**
○ £504.08 (incl VAT)
○ Panasonic: 0500 404041

Panasonic KX-P6500

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

Minimum requirements: 386, 4Mb of RAM, 12Mb of free hard disk space, Windows 95/3.1x.

Alternative laser printers

Star Wintype 4000

Star's Wintype 4000 is a Windows GDI laser printer with a print resolution of 300dpi. It has a quoted print speed of 4ppm and 100-page multi-purpose sheet feeder. The Wintype 4000 can emulate an HP LaserJet IIP (PCL 4.5) and measures 330mm(w)x235mm(d)x265mm(h). It costs £317.25 (including VAT). *Star: 01494 471111*

NEC Superscript 860i

The Superscript 860i has a maximum print resolution of 1,200dpi and a quoted print speed of 8ppm. It is a Windows GDI printer and it can also emulate an HP LaserJet 4 (PCL 5e). The 860i measures 370mm(w)x382mm(d)x125mm(h) and can accommodate up to 200 A4 sheets of paper. It costs £527.58 (including VAT). *NEC: 0645 404020*

Sharp JX9210

The JX9210 is a 4ppm, 600dpi, Windows Printing System laser printer that measures 299mm(w)x291mm(d)x185mm(h). It has a built-in self-recycling feature which means the best possible use is made of the available toner. It has a 100-sheet multi-purpose paper tray, and does not produce any ozone gases while printing. It costs £457.08 (including VAT). *Sharp: 0800 262958*

Lexmark Optra-E

The Optra-E is a true 600dpi laser printer, with 1Mb of memory as standard and a quoted print speed of 6ppm. It is an exact replica of the Epson EPL5500W, although it does not use the Windows Printing System – the Optra-E emulates the HP LaserJet 4L (PCL5). It costs £562.83 (including VAT). *Lexmark: 01628 481500*

▶

Personal laser printers compared

Model	Maximum print resolution (dpi)	Manufacturer's esitmated print speed (in seconds)	Time to first page (in seconds using our test document)	Paper feeder capacity (A4 sheets)	Standard interface	Memory (Mb)	Emulations	Dimensions (width x depth x height in mm)
Brother HL-730	600	6	30	200	Parallel	0.5	HP LaserJet IIP, Epson FX-850, IBM Proprinter XL	366x353x250
Canon LBP460	300	4	34	100	Parallel	Not specified	Windows Printing System, PCL4	336x340x249
Epson EPL5500W	600	6	50	150	Parallel	0.5	Windows Printing System, PCL4	352x407x217
Fujitsu Print Partner 10	600	10	23	250 (750 with second tray fitted	Parallel	2	PCL5e	376x385x251
Hewlett-Packard LaserJet 5L	600	4	60	100	Parallel	1	HP LaserJet	336x312x228
Kyocera FS-400	300	4	42	100	Parallel	1	IBM Proprinter X-24E, Diablo 630, Epson LQ-850, HP LaserJet III, KPDL	353x350x173
Mannesmann Tally T9108	600	8	31	150	Parallel	1	Windows Printing System, PCL 4.5	360x364x176
Oki OL600EX	600	6	31	100	Parallel	1	HP LaserJet IIP+ (PCL 4.5)	320x360x160
Panasonic KX-P6500	600	6	22	100	Parallel	0.5	Windows 3.1x/95 GDI	132x378x287
Xerox DocuPrint 4508	600	8	38	250	Parallel	2	HP LaserJet 4 (PCL5e)	360x367x184
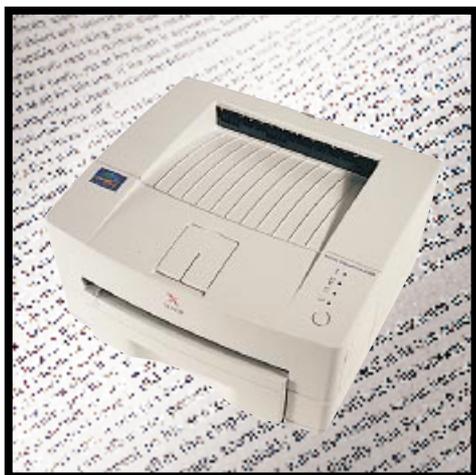
Xerox DocuPrint 4508

Stand this next to Mannesmann Tally's T9108 and you'd have a hard job telling them apart. Unlike the T9108, though, Xerox's machine is not operated by the Windows Printing System. Instead, the DocuPrint 4508 emulates an HP LaserJet 4, which means it accepts page information sent via the page description language PCL5e.

Laser printers dealing with page description languages like PCL or PostScript need much more memory than is necessary for WPS or GDI printers. Xerox has decided to fit 2Mb of memory as standard into the DocuPrint 4508. This is enough memory for 300dpi printing, and should be enough for everyday printing purposes. If you find you need more, the DocuPrint 4508 can be upgraded to a maximum of 34Mb.

Text prints came out very clear with no scattered toner dots visible; graphics prints were also crisp with good contrasts.

Better quality output than its MT lookalike, but it's a good bit more expensive and fractionally slower.

○ £681.50 (incl VAT)
○ Xerox: 0800 787787

Xerox DocuPrint 4508

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

Minimum requirements: none specified.

Kyocera FS400

Kyocera presents its laser printers as the 'greener' option. To this end, all Kyocera machines have minimal packaging and the manuals are printed on recycled paper. The FS400 is no exception.

Text prints were more than reasonable, but printed graphics lacked clarity and at times appeared a little blurred. The FS400 managed an acceptable speed of 3.7ppm when dealing with our text document, but our graphics test trickled out at a paltry 1.9ppm – the slowest out of all the tested machines.

You might opt for this as the 'greenest' option, but you will be making sacrifices in terms of speed, quality and cost.

○ £515.83 (incl VAT)
○ Kyocera:01734 311500

Kyocera FS400

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

Minimum requirements: none specified.
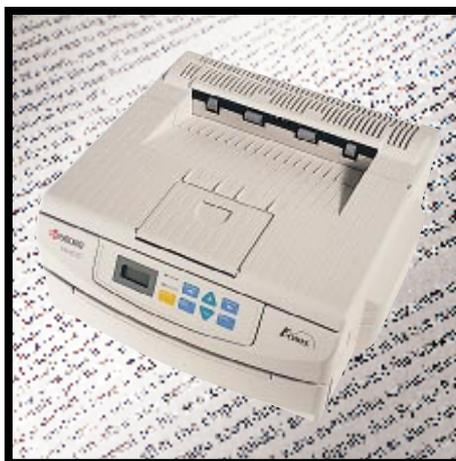
Not one of these printers could be described as bad. However, without a doubt the Best Buy must go to the Brother HL-730. It gave consistently extremely high quality text and graphics output – and it's also pretty fast.

In terms of quality and speed, the Fujitsu Print Partner 10 is hard to beat. However, the high, albeit justified, price means it can only occupy the Recommended slot.

Scott Colvey