

A buyer's guide
to desktop
printers and
multifunctional
devices



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INTRODUCTION

SO, YOU ARE LOOKING FOR A PRINTER

There is a bewildering array of technology available in-store and online but seemingly very little impartial advice as to which will best meet your requirements. Should you select a printer or a multifunctional product? Do you need colour? Is laser better than inkjet? What will it cost to run? This guide will allow you to make an informed decision and help you to select technology that supports your needs and protects your wallet.

Before exploring the options available to you, it is worth spending some time considering what you will use the printer for. Do you need a personal printer or one that can be shared with other users? Are you just looking for a printer or do you need a multifunctional product that also allows you to scan, copy and fax? What type of documents do you print? Are they for business use or are they just filed away? How many pages are you likely to print each month?

MY PRINT REQUIREMENTS

- ✓ Do I just need a printer or do I need a multifunctional product that will also allow me to scan, copy and fax?
- ✓ What type of documents do I print? How important is the print quality? Do I need colour?
- ✓ Do I need a personal printer or one that can be shared with other users?
- ✓ If the printer is going to be shared, how many people are likely to use it?
- ✓ How many pages do I print each month? Are there likely to be peaks in demand?
- ✓ How much space do I have? Does the printer need to fit on a desk or should it be floor standing?
- ✓ Would I like to be able to print from/scan to smart devices and the Cloud?

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SHOULD I BUY A PRINTER OR A MULTIFUNCTIONAL PRODUCT?

The first decision you need to make is whether to buy a printer or a multifunctional product. Multifunctional products, which print, copy, scan and fax, are more versatile than printers and will provide an all-in-one solution to all of your document needs. They are, however, more expensive to purchase. If you already have a scanner or a fax machine on your desk, or have access to a departmental copier or MFP, it may make sense to just buy a printer.

Before making your decision, do carefully consider the advantages of multifunctional technology. Combining print, copy, scan and fax functionality in a single compact unit simplifies operation, releases space and reduces overall expenditure. To explain this last point, multifunctional products use the same supplies (ink or toner) for printing, copying and faxing and only need a single service contract.

Multifunctional products (MFPs) - also referred to as multifunctional printers, multifunctional devices (MFDs) and all-in-ones (AIOs) - use the same print technology as single-function printers. Lower-end multifunctional products, those intended primarily for personal use, usually employ inkjet print technology, whilst higher-end multifunctional products, those developed for business users, typically employ laser or LED print technology.

When considering which multifunctional product to purchase, look closely at the specifications. Not all multifunctional products offer the same functionality or are as easy to use. Most multifunctional products combine print, copy and scan functionality. Some include fax functionality. Some include a duplex for double-sided printing and copying, and some include a document feeder that automates scanning and copying. More features are explored later in this guide.

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INKJET, GELJET, LASER OR LED?



Inkjet is fine for personal use but can prove expensive if you print a lot of pages on regular basis.



Inkjet

Inkjet printers and MFPs squirt finely measured drops of ink onto paper. They produce high quality photographic images but the wet ink can smudge which means they are not really suitable for double-sided printing. Coated paper is needed to achieve the best image quality. Print speeds vary according to page coverage and image quality and, when printing full page graphics in high resolution, the print speed can slow down considerably and will not match the rated speed.

Inkjet printers and MFPs generally have low purchase prices but the printing costs can be high because the ink is expensive to replace. The low cost of acquisition can make inkjet printers and MFPs an attractive proposition for low volume personal/home use but for higher volume users, laser technology, which offers lower page costs, will offer lifetime cost savings.

Advantages: Low initial cost, excellent photo quality.

Disadvantages: High cost per page. Ink can smudge and is not suitable for double-sided printing. Coated paper required for best results. Slows down when printing in high resolution.



Because gel is smudge resistant, it can be used for business applications.



Gel

Gel printers and MFPs work in much the same way as inkjet printers but instead of wet ink, they squirt fast-drying pigment-based gel onto the paper. Because the gel dries upon contact with the paper, the image is smudge resistant, there is no need to use special paper and documents can be printed double-sided. Gel printers tend to be slightly more expensive to buy than inkjet printers but have similar page costs.

Advantages: Excellent photo quality, smudge resistant, use regular paper, can be used for double-sided printing.

Disadvantages: High page costs. Slows down when printing in high resolution.

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INKJET, GELJET, LASER OR LED?



Laser is great for business communication and offers lifetime cost savings.



Laser

Laser printers and MFPs transfer toner onto paper using static electricity. Heat is used to fuse the toner to the paper. Laser printers do not require special paper and produce high quality text. Print is generally produced at the same speed irrespective of page coverage and image quality. Whilst the initial purchase price is usually higher than inkjet or gel printers, toner cartridges have higher yields (number of pages per cartridge) and offer a much lower cost per page and can offer considerable lifetime cost savings.

Advantages: Reliable technology, high quality text, regular paper, consistent print speed, lowest cost per page.

Disadvantages: Higher cost of acquisition.



LED engines provide small footprints, high reliability and low energy usage for small businesses.



LED

The LED print technology is an equivalent to a laser system and LED printers and MFPs transfer toner onto paper using static electricity. They are usually fast and produce high-resolution colour, sharp. Although this print technology has its limitations, it does have advantages over laser.

Advantages: High quality print at true 1200dpi, quiet operation, compact footprint, low energy usage, reliability and ease of maintenance

Disadvantages: Higher cost of acquisition, limited speed for high volume machines

Tip: If you wish to reduce energy consumption and minimise your carbon footprint, purchase a printer or MFP with a low TEC (Typical Electricity Consumption) rating.

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COLOUR OR BLACK-AND-WHITE?

The next consideration is whether to purchase a black-and-white printer/MFP or a colour printer/MFP. That decision will be driven by the type of documents you intend to print and with consideration to the additional costs associated with colour printing.

Colour printers and MFPs can cost twice as much to purchase as black-and-white printers and MFPs of similar specification, and the cost of printing a colour page is likely to be four to six times that of a black-and-white page. That is because four colours (and four different cartridges) - cyan, magenta, yellow and black - are combined to create a colour image. Some inkjet printers and MFPs also use additional colours (as many as seven in total) to improve colour depth.

The advantage of colour printers and MFPs is that they provide the facility to print both in colour and in black-and-white. PowerPoint presentations and sales proposals can be printed in colour to add impact, improve professionalism and make information easier to understand, whilst everyday letters and reports can be printed in black-and-white, to minimise print costs.

Some colour printers and MFPs have ink or toner saving modes, also called economy colour, that can minimise page costs by reducing ink or toner density. Whilst this can save money, reducing page costs by as much as 50%, the resultant image quality is not as good, and colour documents printed in toner saving mode, whilst easier to read and understand than black-and-white documents, will probably not be of high enough quality for external distribution.

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UNDERSTANDING THE COSTS OF OWNERSHIP

When evaluating printers and multifunctional products, it is important to look further than just the initial purchase price. There are other factors to consider, including the cost of supplies, paper and electricity usage. When the cost of ink and coated paper is taken into consideration, inkjet printers and MFPs, which can be perceived as low-risk acquisitions, can have a much higher total cost of ownership (TCO) than laser printers and MFPs.

It is worth establishing the cost per page before purchasing a device. Laser printers and MFPs have higher yield cartridges (capable of printing more pages) than inkjet printers and MFPs, resulting in lower page costs. As print volumes increase, the lower page costs help to reduce the total cost of ownership. To calculate the page cost, divide the cost of the replacement cartridges by the page yield (usually expressed as an ISO rating).

The ISO page yield is determined by testing the cartridges against a series of standardised test pages. ISO/IEC 19752 is the standard used to determine black toner yield, ISO/IEC 19752 is used to determine colour toner yield and ISO/IEC 24711 is used to determine colour inkjet yield. The ISO yields give a fair (and comparable) approximation of how many pages a cartridge will print, although in everyday use, factors such as page coverage, job length and even room temperature will affect actual page yield.

Although it is clear that page yield can have a huge impact upon total cost of ownership, for lower volume personal users, inkjet technology may still prove cost effective. One of the advantages of buying smaller, low yield ink cartridges is that the retail price of the replacement cartridges appears to be relatively low, even though the resulting cost per page is high. Home users of laser technology, particularly colour devices, can be surprised by the apparent high replacement cost of high-capacity toner cartridges.

Tip: If you don't know your print volume, think about how many reams of paper you use in a month. One ream (the standard pack size) is 500 sheets.

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HOW FAST DOES MY PRINTER NEED TO BE?

It may seem strange, but printers and MFPs are often defined by their speed, measured in prints or pages per minute (ppm). For many users, particularly those who only occasionally use a printer, the print speed will seem an irrelevance. For others, those who regularly print multipage documents or who share their printer with other users, slow print speeds can be a cause of enormous frustration.

The print speed is also a good indication of reliability. Faster devices are generally more robust and able to handle larger document volumes. The trend in business is towards faster technology because it increases productivity and is more reliable. A fast laser printer or MFP will probably produce its first colour or black and white page in under 10 seconds and will have a continuous print speed of 30 to 40 pages a minute.

As ever, you need to consider your own requirements. If you are likely to be the only user and you only print the occasional document, the time it takes the printer to produce its first page will be more important to you than the continuous print speed. If, however, you are likely to print multipage documents or share your printer with other users, it is worth investing in a faster device, as it will reduce print bottlenecks.

Tip: If you usually only print one or two pages at a time, the speed at which the first page is produced (first page out) will be more important than the continuous print speed.

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WHAT OTHER STANDARD FEATURES SHOULD I CONSIDER?

Document Feeder

If you are going to scan, copy or fax multipage documents, you should purchase an MFP with a document feeder. Document feeders streamline operation by automatically feeding originals for scanning, copying and faxing. If an MFP doesn't have a document feeder, the originals have to be placed one by one on the platen glass.

There are different types of document feeder. An ADF (automatic document feeder) will feed single-sided originals whilst an ARDF (automatic reversing document feeder) can feed double-sided originals and turn them for scanning one side after the other. Some machines may even be equipped with an SPDF (single pass document feeder) which speeds the process by scanning both sides of an original in a single pass.

Duplex

Some printers and MFPs are equipped with an automatic duplex that turns paper for double-sided (duplex) printing. Devices without a duplex unit can only print single-sided (simplex). Double-sided printing saves paper and reduces total costs of ownership. When you consider that a ream of paper (500 sheets) can cost £5, the savings accrued from double-sided printing can be considerable. Also, if you scan and copy frequently consider paying more for ARDF/ RADF to save time and money on duplex scan and copy.

Additional Paper Trays

Most desktop printers and MFPs will be equipped with either a 250 or 500-sheet paper tray. The advantage of a 500-sheet paper tray is that it will hold a full ream of paper. If you are likely to print a large number of documents or want to hold different sizes or types of paper online, you should consider purchasing a device which has more than one paper tray.

With more paper online, there is less likelihood of the printer stopping partway through a print job. What is more, if you purchase a printer or MFP that supports auto tray switching, you will be able to print virtually non-stop because the printer is able to automatically switch to another tray when the first tray runs out of paper. The empty tray can be replenished without interrupting the print process.

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WHAT OTHER STANDARD FEATURES SHOULD I CONSIDER?

Connecting to a Network

You need to consider how you will send work to the printer. Most printers and MFPs are equipped with a USB port which enables the device to be connected directly to a PC. If the printer or MFP is going to be used by more than one user or, if you want to be able to print remotely to the device, you will need to purchase a network or wireless printer.

Connecting printers and MFPs to a network enables multiple users to share the resource, reducing the number of devices required and improving the return on investment. The print network can be wired or wireless. Printers and MFPs with a wireless interface may be connected using WiFi to a wireless router whilst printers and MFPs with an ethernet interface connect to the print network using an ethernet cable.

You may also want to print to the device using a smartphone or tablet. Google Cloud Print can be used to print to any printer that is connected to a computer or print network. Alternatively, Android or iOS smartphone and tablet users can download apps, such as Ricoh's Smart Print and Scan app that facilitate direct connection with the printer/MFP. Support for iPhones and iPads is more limited when using the functionality of the built in AirPrint.

Some printers and MFPs offer support for a second print network. This can be important in an environment where there is an open and a closed (secure) network, such as perhaps in a school, a surgery or a bank. Using one device to support the print needs of two print networks can help to reduce costs. This option is called network interface card (NIC Port).

Scanning and distributing information

If you are considering an MFP, one of the key selection criteria is likely to be scanning. Most MFPs support high-resolution colour scanning, enabling hardcopy documents to be digitised and saved in electronic format. Depending upon the functionality of the MFP, scanned documents can be forwarded to email, saved to a memory stick, or uploaded to a document server, network location or centralised record. Some MFPs even support scanning to smartphones and tablets which is very useful for those working on the go.

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WHAT OTHER STANDARD FEATURES SHOULD I CONSIDER?

Do not assume that all MFPs provide the same scanning functionality or are as easy to use. When considering an MFP, check that it supports the scan-to functionality that you require (scan to email, scan to USB, scan to folder, etc) and that the scanning features are easy to use. Does it, for example, support directory access (LDAP) and can documents be previewed at the control panel?

Ease of use

Printers and MFPs are workplace tools and are supposed to make your working life easier. The trouble with technology is that whilst it may promise to do all sorts of clever things, it can sometimes be difficult to use. If the interface looks cheap - perhaps just a two-line LCD and an array of buttons - you will spend a lot of time toggling between menus.

The latest business machines incorporate colour touchscreen operation panels that are navigated with tap and flick gestures, much like a smart phone or tablet. These interfaces usually incorporate smart apps that automate print, copy, scan and fax functions. Some even incorporate browsers that enable web content to be opened and printed from the operation panel of the printer/MFP.

Some manufacturers now offer the same uniform and easy to use 'smart' operating platforms across a variety of business systems. In a multi-machine environment, employees moving from one such smart device to another are more productive and engaged because they are already familiar with the operating system. Similarly, the Universal Print Driver takes the headache of learning how to use machine's features.

For more information about 'smart operating platforms, visit the [Ricoh website](#)

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WHAT OTHER STANDARD FEATURES SHOULD I CONSIDER?

Ongoing service and support

When you have decided which device to purchase, you will need to think about support.

Most low-end printers and MFPs are designed to be self-maintained. What that means is that the user is expected to maintain the device by regularly replacing fixed-life service parts, such as photoconductor units and fusing belts, as well as replenishing toner. These parts can be expensive and should be factored when calculating ownership costs.

Most vendors will offer a 'care pack' or 'extended warranty' at the time of purchase. This is usually a fixed priced, minimum term contract (one, two or three years) which provides for on-site support in the event of failure. A third party contractor will usually provide a break-fix service on behalf of the manufacturer, carrying out emergency repairs.

It is important to note that these contracts do not cover preventative maintenance or allow for replacement of fixed-life service parts, such as photoconductor units. Variations on the contract terms can include a guaranteed next business day response or a guaranteed four-hour same day response. These contracts can also be expensive and, like the cost of service parts, should be factored in when calculating ownership costs.

Some vendors are able to provide more comprehensive service arrangements. A pay-per-page service contract will usually cover field-based support and include free provision of fixed-life service parts and toner. Services are paid for, as consumed, reducing upfront service costs and, with a pre agreed page cost, there are no nasty surprises.

Tip: Avoid 'consumable shock'. Maintenance parts and consumables can be expensive. A pay-per-page service contract will cover the cost of maintenance parts and consumables.

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GLOSSARY OF TERMS

ADF (Automatic Document Feeder)

Automatically feeds single sided originals for scanning, copying and faxing. If an MFP doesn't have a document feeder, the originals have to be placed one by one on the platen glass.

AirPrint

AirPrint-compatible printers can print via a wireless LAN (Wi-Fi) from Apple OS X and iOS operating systems.

All-in-One (AIO)

Multifunctional device which provides 3-in-1 print, copy and scan or 4-in-1 print, copy, scan and fax functionality.

ARDF (Automatic Reversing Document Feeder)

Automatically feeds double sided originals for scanning, copying and faxing. If an MFP doesn't have a document feeder, the originals have to be placed one by one on the platen glass.

Bluetooth Interface

Wireless interface which enables communication over short distances with the printer/MFP.

Bypass Tray

A bypass tray allows you to feed non-standard paper without having to put it in one of the main paper trays.

CMYK (Cyan, Magenta, Yellow and Black)

The four colours (cyan, magenta, yellow and black) which are combined to create full colour printed images.

Coated paper

Coated paper absorbs less ink than plain paper, reducing the tendency for dyes to bleed.

Compression

Process of compacting digital data, images and text to reduce file sizes.

Consumables

Maintenance parts, toner, paper any other materials that must be periodically replaced.

Desktop Device

A machine that can be placed on a desk or table.

Driver

Software that tells the computer how to interact with a device, such as a printer or MFP.

Duplex Unit

Automatically turns paper for double sided (duplex) printing and copying.

Duty Cycle

The absolute number of pages that can be printed per-month at rated print quality of a machine

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GLOSSARY OF TERMS

Ethernet Interface

Wired interface which uses ethernet cabling to connect the printer/MFP to the print network.

Fax Memory

Stores fax messages if the machine runs out of paper.

Fax Option

Option which extends MFP functionality to include fax.

First Page Out Time (FPOT)

The time taken to print the first page of a document. First print speed is important give that many documents are one or twopages.

Fuser Unit

The fuser rollers heat the page after the toner is applied, so the toner partially melts and sticks to the page for a permanent bond.

GDI (Graphical Display Interface)

The display language interface for Microsoft Windows systems. GDI printers are compatible only with Windows systems.

Inkjet

A technology that sprays ink onto the paper through tiny nozzles.

JBIG (Joint Bi-level Image Experts Group)

JBIG is a standard of compression used in facsimile transmission.

LCT (Large Capacity Tray)

Generally refers to a paper tray holding 1,000 sheets or more.

LED print

Light-emitting diode printing is also an electro-photographic process that uses a matrix of LEDs as its light

Mailbox

An accessory which allows printed jobs to be separated into specific sorter bins.

Media

A material that is printed upon, such as plain paper, glossy paper, or transparency film.

Mopria

Mopria-compatible printers can print via a wireless LAN (Wi-Fi) from smart phones and tablets running the Android operating system.

Multifunctional Product (MFP)

Multifunctional device which provides 3-in-1 print, copy and scan or 4-in-1 print, copy, scan and fax functionality.

NIC (Network Interface Card)

Required for networking a multifunctional copier-printer. The most common standard is Ethernet.

GLOSSARY OF TERMS

OCR (Optical Character Recognition)

The ability of software to recognize and translate handwritten characters into machine-readable text.

OPM (Originals per Minute)

The number of A4-size originals a scanner can process in a minute.

Paper Capacity

Maximum number of sheets of paper a printer/MFD can store in its standard paper trays.

Paper Tray

Removable cassette which stores paper online ready for use.

Paper Weight

The paper weight, measured in gsm, of the paper supported by the printer/MFP.

Parallel Interface (IEEE1284)

A parallel interface is a one or two-way interface that can transfer several different bits of information simultaneously.

PCL (Printer Control Language)

Industry standard page description language which supports printing of office documents.

PDF (Portable Document Format)

File format used to present and exchange documents reliably, independent of software, hardware, or operating system.

PDL (Page Description Language)

The print language or languages supported by the printer/MFP.

Photoconductor

A charge sensitive material such as selenium or an organic drum onto which data is written.

Platen glass

The glass area on which you place original documents to be scanned, copied or faxed.

PPM (Pages per Minute)

The number of A4-size pages a device can output per minute.

Print Speed

Printers and MFDs are often defined by their speed, measured in prints or pages per minute (ppm)

Printer Driver

The printer driver is a software file. Applications use this file to configure documents to printing on a specific printer/MFP.

PS (PostScript)

Industry standard page description language which supports reliable printing of graphic documents.

Reduction/Enlargement

Preset ratios which simplify reduction and enlargement when copying. A 71% reduction ratio reduces an A4 original to A5 size.

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GLOSSARY OF TERMS

Resolution

Resolution is a measure of image quality. 600 dpi means that the scanned or printed image consists of 600 x 600 dots per inch (36,000 dots per inch in total). Simplex Simplex refers to single-sided printing.

SPDF

Single Pass Document Feeder used for double sided scanning

Speed-Dial

Two or Three-digit codes that can be used to dial preprogrammed fax numbers

Stapler/Sorter

A sorter that staples collated documents.

TEC value

Typical weekly electricity consumption used to compare electricity intake of electronic devices.

TIFF (Tagged Image File Format)

Popular file format for images. Especially useful for graphics which are likely to pass from one application to another across platforms.

Toner

Plastic-carbon based substance that forms the image on the paper.

Touchscreen Panel

Options can be selected by a simple touch of the menu display on the LCD display.

TWAIN (Toolkit Without An Interesting Name)

An industry standard scanning interface which enables software to 'pull' images from a scanner.

USB2.0 (Universal Serial Bus)

Industry standard interface that allows communication between host devices such as computers and printer/MFPs.

Warm-Up Time

The time taken by a printer or MFP to warm up or ready itself for printing when powered up.

Wireless Interface (IEEE802.11)

Wireless interface which enables communication over longer distances (than Bluetooth) with the printer/MFP.

Workflow

The movement of documents around an organisation for purposes including sign-off, evaluation, performing activities in a process.

Yield

The number of prints that a cartridge or other consumable item will produce. The ISO page yield is determined by testing the cartridges against a series of standardised test pages.

Ricoh is a global technology company that has been transforming the way people work for more than 80 years. Under its corporate tagline – imagine. change. – Ricoh continues to empower companies and individuals with services and technologies that inspire innovation, enhance sustainability and boost business growth. These include document management systems, IT services, production print solutions, visual communications systems, digital cameras, and industrial systems.

Headquartered in Tokyo, Ricoh Group operates in approximately 200 countries and regions. In the financial year ending March 2016, Ricoh Group had worldwide sales of 2,209 billion yen (approx. 19.6 billion USD).

Get in touch

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