



Will Any Printer Do?

You are in for a big surprise if you think purchasing any printer for use in the office will suffice. Printers have evolved since the dot matrix days and have specialized functions for different occasions. If you don't do your homework, you may end up with a printer that does not fulfill your office needs.

So how do you choose between the different types of printers - Laser, Inkjet, Dot Matrix, Solid Ink, etc.? Which of these is suitable for your office? Let www.hardwarezone.com® answer all that with the Business Printer Guide. We will introduce you to the different types of printers that are designed for the office environment.

Here are the topics in this guide:

What do you mean?

Don't just stare blankly at the printer pamphlets. Understanding the technical terms can help you make the right buying decisions. Allow us to decipher commonly used technical jargon in this topic.

Printing Technologies

There are generally five types of printing technologies in the market today:- Laser (color/mono), Solid-ink, Inkjet, Dye-sublimation and Dot-matrix . Find out which of these suits your various office needs here.

Buying Tips

Before you step into the stores, check out our buying guidelines first on how to choose a printer to meet your company's needs.

Eco-friendly Printing

Before you step into the stores, check out our buying guidelines first on how to choose a printer to meet your company's needs.

Print Management

Are you a company with no idea how many printers are in your fleet and how to reduce printing costs across the board? Some printer companies now offer print management consultancy services for enterprise-level customers to help them optimize their fleet.



What do you mean?

Dye base inks	One of the two main types of inks used in inkjet printing, dyes bind to paper better than pigments and offer superior color reproduction and glossiness, yet they suffer from low fade resistance to light and air (ozone). In addition, colors tend to bleed together when exposed to water.
Pigment base ink	In general pigmented inks offer better fade resistance than dye-based inks. However, there are also drawbacks. For starters, dyes bind to paper better than pigments and offer superior color reproduction and glossiness.
Picolitre (pl)	Miniscule unit of liquid measurement with regard to inkjet inks. These days, some inkjets come with ink droplet volumes as small as 1 picoliters.
Dots per Inch (dpi)	A measurement of print resolution, dpi indicates how many individual dots a device can create on a page per square inch of area. Dpi is typically listed as horizontal resolution by vertical resolution. The higher the dpi, the better the resolution.
PPM (Page Per Minute)	A unit that represents the speed of printing.
Bleeding	Two ink colours run into each other.
Blooming	Ink absorbs into the paper, spreading beyond the ink dot size applied to the page.
Cockling	Paper ripple due to ink moisture.
Haloing	Lightening of black ink when it is next to colour.
Wicking	Ink spreads along the fibers in the paper, creating a "spider web" effect.
AIO	All in One. A multipurpose device capable of printing, scanning and even faxing.
Pictbridge	Industry standard for a direct print system from cameras to printers.
Spooling	To store (data sent to a printer) in a buffer, allowing the program that sent the data to the printer to resume its normal operation.
CMYK	An acronym that stands for cyan, magenta, yellow and black. Almost all color printers use the four basic colors of ink to produce a color image, mixing them to get different shades and colors. This is generally called a 4-color system. These are general names for the color hue of the colorants (dyes and pigments) typically used in formatting (including inkjet printing). These four colors are used to create all colors in this type of digital image.



Printing Technologies

Here are some of the more common types of printers that are used in business environments today.

Dot Matrix



The good old dot matrix printer uses what is commonly known as "impact technology". In the print head of a serial dot matrix printer, many small pins strike a ribbon that is coated with ink, and upon impact, transfer the ink to the paper. The advantages of such printers are in the low cost of ownership and durability. However, they have no multi-color print capability, and therefore poorer graphics print quality. Not to mention that they are noisy too. However, dot matrix printers are still the only ones that can do form printing with carbon paper because of the print head impact operation, and can still be found in places such as hospitals and warehouses where reasonable text output is all that is required. Still, for single sheet, normal printing, the relatively low cost of inkjets nowadays makes dot matrix printers a less attractive option.

Inkjet



Simply put, an inkjet printer works by using nozzles to spray very fine droplets of ink to the paper. There are two popular types of inkjet technology today, namely thermal bubble jet technology (also known as "bubble jet") that is used by manufacturers such as Canon and HP; and piezoelectric technology, which was invented by EPSON. The advantages of inkjet technology are that it is relatively inexpensive, and that it is able to produce good-looking text as well as photo prints. Speed is reasonable too, though not as fast as laser printers.



Dye-Sublimation



Instead of using ink tanks found in an inkjet, a dye-sublimation printer uses a ribbon with sections of cyan, magenta, yellow and black dye. The print head heats up as it passes over the film, causing the dyes to vaporize and deposit onto the surface of the paper before they return to solid form. Such infusion means that prints are less prone to fading and distortion over time. Dye-sublimation printers are commonly used in demanding graphic art and photographic applications but are now increasingly used by many consumer-level direct photo printing and portable printers.

Mono Laser



Without going into details, a laser printer basically works by bonding the dry powdered ink (in the toner) onto the paper through means of static electricity and heat. The obvious advantages of a laser printer are its speed and high levels of precision. Another would be its ability to handle many concurrent jobs, thus making it a popular choice in many offices. Text printed by a laser printer is also great looking and does not smudge as much as an inkjet's would, though graphics (especially photos) can be its Achilles' heel. Laser printers are generally more expensive than inkjets, but running costs can be kept quite low as a toner cartridge can last for many prints.

Color Laser



Early laser printers were restricted to mainly monochrome printing. But color lasers are gaining momentum nowadays with the advancement in printing technologies. Color lasers work the same way as monochrome lasers; but with the additional colors (cyan, magenta, yellow and black), the paper has to go through the printing process four times - one for the application of each color. Such color lasers are what we called "four-pass" color laser printers. But some of the newest color lasers today are able to print both monochrome and color in just a single pass, which means printing in color is as fast as printing in monochrome.



Solid Ink



This technology (exclusive to Fuji Xerox) makes use of solid blocks of ink that are made from a secret soy and wax-based formula. It works by having the printer melt the different colored inks into liquid form, and then combining them to produce the desired colors and prints the image onto a drum that is later transferred onto the paper medium. The obvious advantages are its fast throughput and high print quality. Color printouts are also produced within a single pass, and inks can be refilled on the fly (just put the blocks in) without the need to shut down the printer. As the ink blocks do not need a cartridge for delivery, this results in less wastage and are thus more environmentally friendly. Its ability to print on a very wide range of media is another bonus.

Buying Tips

Selecting a printer for your workplace is not just going out to the store and picking up the cheapest one you can find. Neither is it just buying the most expensive, most full-featured industrial printer your budget allows. There is some more homework that needs to be done first:

Knowing your environment

It is paramount to know your printing needs and buy a printer that is not an over or under-kill with regard to your usage requirements. Other than setting a budget, do ponder these few questions first.

What Do You Print?

This is the first question that a decision maker should ask him or herself. If you are printing purely text documents on a small scale, then a basic inkjet printer may be all that is required. But if high volume and impeccable text quality are needed, a laser printer may be a better choice. Conversely, if photo printing forms a huge part of your printing, then you may want to narrow your choices to printers that have better photo printing features, such as six or eight color inks, built-in media cards readers etc. Also, if you need to print on a special type of paper, make sure that the printers you have shortlisted support it too. You should pay attention to the paper handling capability of the printer tray(s) too.

How Much And How Fast Do You Print?

Speed is a nice thing to have in a printer, but it would be such a waste to buy the latest 25ppm (page per minute) printer if you are only going to use it once a day, or just for printing document drafts. If large volume and high-speed printing are necessary, then you can safely delete slower inkjet printers or even some low-end laser printers from your shopping list. Similarly, a laser printer may be more cost effective if you need a huge duty cycle of say 80,000 pages per month.



How Many People Are Using This Printer?

The number of personnel accessing the printer would directly determine the relevant specifications (such as connectivity) to look out for in the printer. A simple standalone with just USB connection would fit the bill of a single user; however, it may not have the networking interfaces, features and software for it to be shared among a large workgroup. Network interfaces, add-ons and certain management software often come as additional costs - therefore knowing how this printer is going to be deployed is essential.

What Is Your Existing Equipment?

All-in-ones (AIOs) are gaining popularity in the corporate environment (especially in SMEs); and for good reasons too. If you are going to discard your existing office printers, check if the three-year old scanner and four-year old copier need replacement as well. Most all-in-ones merge printing, scanning, copying and even faxing in one neat unit, which is a great space and cost saver. AIOs can come in the form of inkjets or lasers, further adding more flexibility and variety to choose from. Some of them can even double up as a dedicated photo printer with print quality that matches the photos printed in a photo-lab.

Do You Need To Buy A Printer In The First Place?

Unless the machine is suffering from unrecoverable damage or extreme wear-and-tear that prevents it to function at a satisfactory level, sometimes a wholesale printer change may not be the only solution. Many business printers nowadays (especially lasers) are modular in nature, which means specific features can be added on as and when you deem fit. If the 500-page paper tray found in your existing printer is not enough, check if it allows for another 500-page tray add-on. Similarly, if you already have a network printer, check with the manufacturer if you can upgrade it to an AIO or multifunction printer via modular add-ons.

Additional things to look out for when buying

Here are some printer related issues to take note of before you dash into your nearest IT store:

Look Out For Running Costs

In the case of a printer, its initial purchase cost is only half the deal. Running costs have to be taken into consideration as well. Supplies cost (such as the cost of ink cartridges for inkjets and the cost of toners for lasers) is a prime example of running cost. More often than not, the cost of the supplies can amount to more than 20% of the price of the printer. Cheaper third party inks are another option, but are generally not recommended. Most of the time, they produce inferior printouts, and in the case of printer malfunctions due to using such inks, the manufacturers would most likely not honor your warranty claims.

Check for Operating System Compatibility

Due to the fact that most people use Microsoft Windows as their Operating System (OS), they do not really worry about OS compatibility during their purchase. But if you are a Mac or Linux OS user, this is one area you should pay particular attention to. Most of the printers today will work with a Mac simply via a USB connection but they may not come with a Mac compatible driver and accompanying print suite that allows you to change detailed printing parameters such as page setup, paper selection, advanced color settings and more. Over on the Linux side of things, sadly, the pool of users for this OS is not as strong as a Mac. Hence, not many manufacturers will provide support for Linux systems. Therefore, it is best to check with the manufacturers' website first before purchasing any printer if you are buying a non Microsoft OS system.



Scrutinize the Specs

Specifications at a glance do not tell the whole story. This is especially true when it comes to speed. Some manufacturers may list the printer's draft mode printing speed on the brochure or packaging instead of its normal mode print speed. The difference in timings of both modes as well as their print quality can be quite diverse, so it is wise to verify the claims made by the vendors. For AIO machines, also look out for the scanner and copier specifications (such as speed and bit depth) to find a match for your needs. If you additionally require fax functionality, ensure that the prospective AIO has a built-in modem and is rated for at least 56Kbps. Advanced models can even perform batch copying and faxing jobs. Since the specs and features of printers and AIO machines can scale from modest personal user needs, right up to business standards serving a regular office, we advise you to analyze your current and near-future needs before selecting a print device that best matches your requirements.

The More Memory, The Better

While it is important to have sufficient memory on your workstation, what we are referring to in this section is the printer's own memory. Make sure that the printer has more than sufficient memory to handle print jobs at the resolution you require. In a networked environment, this is especially important as the more memory the printer is equipped, the more print jobs it can spool (i.e. storing jobs on the printer's own buffer to free up client system's memory). Printers with 8MB - 16MB of memory are adequate for SOHO or even SMB environments with simple needs, but in large scale networked office serving a much larger workforce and varying print job sizes, a proper business-class or enterprise-class printer equipped with a 20GB hard disk drive should be a minimum requirement to prevent bottlenecking of the printer (and even the network) from documents awaiting print. Thus, print bandwidth planning would be valuable to ensure you target the right class of printers. As always, plan to have headroom for growth (such as equipping the potential printer with more memory than required).

Built-in Print Server Vs. Network Printing

Routers/switches with print server options lets you connect any USB printer directly to your network, eliminating the need to dedicate a PC for print sharing chores. The advantage of using this method is that it frees up the need for a dedicated PC print server, thus greatly reducing maintenance costs as the router with print server functionality handles all incoming print requests.

Some of the newer printers come with network capability. Instead of connecting the printer to the network via USB and let the router/switch handle the print server task, the printer itself (connected to the network directly via Ethernet connection) takes over the print server task and manages all incoming print jobs. The advantage of using printers with built-in print server feature instead of the former method is that it allows everyone in the network to access all the functions of the printer (such as scanning, faxing and more) seamlessly by any existing and new computers hooked to the network. The latter is possible on some of these printers with printer server option because they are able to distribute their drivers to any PC in the network such that it can enable almost instant use of the printer.



In-house Printing Vs. Outsource Printing (Copying)

The real deal here is cost saving and convenience. For small-scale and straightforward printing, in-house printing is the most cost effective and convenient option. Anything that requires more than 30 sets of 30 pages (also known as bulk printing), it would be wise to outsource the printing to professional printing companies who can offer you a good deal for such bulk printing. They can even offer you binding and cover services, though that would cost you more. If you foresee that you require bulk printing and would like to have it done in-house for confidentiality concerns, it would be wise to invest in a good cost-effective printing machine for doing your own in-house printing.

Do I need Wireless Printing?

Wireless printing capability is good to have in a small working environment. It eliminates the use of wires and can be easily setup using Bluetooth or Wi-Fi (802.11 standards). Bluetooth connection is generally speedier as compared to a Wi-Fi connection, but the drawback is that it can only service one client at a time unlike Wi-Fi. Hence, Bluetooth wireless printing is more popular with mobile phones and compact photo printers. Wireless printing, is however not recommended for MNC and SMB companies because of the limited wireless range.

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Consider Support and Warranty Too

Always get a printer from a reputable vendor or manufacturer. Even the highest-end and costliest printer can also have an off day; so study and understand the level of support and the type of warranty (be it off-site or on-site) the vendor provides. Warranties can vary across different brands so it is wise to check what's covered and what's not. And always test the printer right after purchase so that problems can be rectified in the shortest time possible.



3 reasons to use original inks

- **Better quality prints**
The way ink and paper reacts involves a lot of variables, and the original manufacturer has developed their inks and paper together to give you the best possible printing results. This is especially important for quality photo prints with photo paper.
- **Longer print head shelf life**
The official inks are made to work best with each printer model, and their compositions are trade secrets. There's always a risk that third-party inks, either due to lower quality materials or different compositions, might clog up the print heads more easily than original inks.
- **Keeping the warranty**
Using refill inks usually void your warranty. Voiding the warranty also means you'll have to pay to repair the damage yourself should refill inks spill inside the printer.

Secure Printing

Some businesses can't afford the risk of having confidential documents leaked. That's why printer manufacturers have introduced printers that add an extra layer of security before print jobs will be completed.

Using these printers, when users send a job to print, these printers will hold the printing job in a server. The user will then physically need to go to the printer, and authenticate before the printer will actually print the job.

There are various methods to authenticate, depending on the printer model. Some require scanning of a security pass, some will ask for a security code. In all cases, this extra layer of security helps companies track who prints what and when.

Besides helping companies be more secure by adding a layer of responsibility to printing, it also helps reduce costs. Many print jobs are sent to print and then forgotten about. This process requires the person requesting the print to be at the printer itself to finish the print job, and if the print job isn't authenticated within a set amount of time, it's deleted from the server. In this way, authentication reduces the number of frivolous prints.

Conclusion

Buying a printer for yourself is already a difficult task, and this is all the more so in a business setting. There are many technologies in the market as detailed earlier, and each of them is suited for varying purposes. For most SOHO and SME users, understanding your detailed office printing needs and matching them closely to the specifications of the printers should be fine. A little research on the Internet or reading review magazines such as HWM don't hurt too.



Eco-friendly Printing

Eco-friendly printers aren't just good for the environment; they also help you to save money by cutting energy, material and consumables' costs.

Energy Costs



Look for ENERGY STAR certified products which are more energy efficient. ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that helps protect the environment through certifying energy efficient products and practices.

Material Costs

An All-In-One device that combines multiple functions in a single unit takes up less space, and uses less materials and energy to make than multiple devices. It usually also costs less to buy than many separate devices.

Responsible manufacturers also now package their products in smaller and more efficient packaging, reducing material use and improving shipping efficiency. Some also offer take-back programs, where you can send your old ink cartridges back for recycling.

Consumable Costs

Cutting down on paper usage helps both the environment and reduces costs. Duplex printers help save by printing on both sides of the paper. AIOs with digital faxing capabilities help save paper when you send and receive faxes through your PC. Secure printing that need authorization before printing is completed helps reduce the number of unnecessary jobs that are printed and then not collected.

Print Management

Some printer companies now offer advanced print management services for enterprise level clients. They help you optimize your printing usage and reduce cost by studying your usage patterns, then recommending best practices like number of printers, best printer model to do the job, and how to change workflow to reduce printing and increase digital workflow.

If you find your company filled with too many printers which don't do the job, and you have no idea just how much your departments are printing and where the costs are going, you can approach your vendors to ask about these consultancy services.