

Your Buyers Guide to Thermal Label Printers



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Why have a label printer?

For a modest investment you'll have a printer that's easy to use, produces excellent print and you won't have to keep switching labels in your laser printer. What's more, roll labels are cheaper than sheet labels so you'll save money the more you'll print.

You'll get:

- Near instant printing. Typically you wait a few seconds and you have your labels printed. With a laser printer you need to wait for the printer to wake up, warm up then print.
- Single label capability: With a specialist label printer you can print as few as one label, unlike a laser or an inkjet which typically prints pages of labels.

One compelling reason for investing in a label printer is what you're printing onto. If you need long lasting labels, scratch or smudge resistance, coloured text, heat resistant labels or printing onto plastics or tiny text and barcodes – you'll need a thermal transfer printer.

Choosing the Right Barcode Printer

There are hundreds of different label and tag printers available from dozens of different manufacturers. The aim of this article is to help you decide which printer suits you the best.

What will you learn:

- First we'll touch upon the technology behind label printing.
- Then you'll be introduced to the different barcode printers you can buy – desktop, portable or industrial.
- Next you'll learn what speciality printers are available followed by the various ways you'll be able to connect to your new printer and
- Finally you'll understand the different add-ons and options that will make your printing easier.

Before we run through barcode label printers, I've got a few questions you need to ask yourself. If you want to call us and have us talk you through your options, have some answers to these questions and give us a call on 01359 271 111.

The first questions:

- How long will your labels need to last? A matter of days or weeks – or longer?
- What are you printing? Labels, receipts, tags, tickets or wristbands?
- How many labels (or other items) do you expect to print each day – up to 500 or more than 500?
- Where do you plan to use your printer? In a nice, clean office, a dusty factory or outdoors?
- Does it need to be rugged?
- Does it need to be portable?

If you can answer these questions, you'll be better placed to decide what printer features you need.

Direct Thermal or Thermal Transfer

Thermal printers use heat to produce very high quality barcodes and other text on labels, tags, tickets, wristbands or receipt paper. Compared to laser and inkjet printing technologies, thermal-printers:

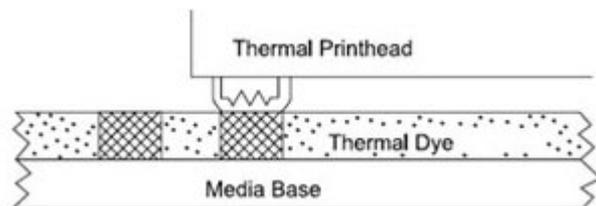
- Need less maintenance,
- have lower cost labels, tickets and ink,
- can print single labels or receipts (not whole A4 sheets) and print faster (up to 450mm per second)
- Near instant printing
- while not suffering bleed as you find with some inkjet printers or fade with some lasers.

Thermal printers can print in two different ways –Direct Thermal or Thermal Transfer. Which method of printing is decided by:

1. How long the labels (or other printing materials) need to last
2. What material you plan to print onto.

What does Direct Thermal and Thermal Transfer mean?

All 'thermal' printer, as the name suggests use heat to print. Direct thermal printers print onto special heat-sensitive media that darkens as it passes under the heated sections of the printhead.



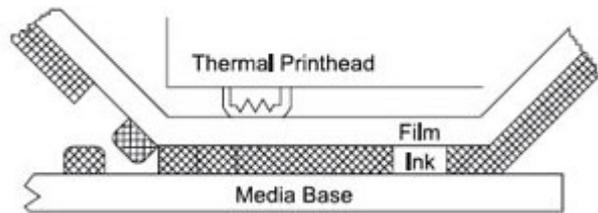
Because they print without needing an ink ribbon, direct thermal printers are simple – no need to change inks and no ribbon mechanism built into the printer. Direct thermal printed labels usually have a good shelf life but are not well suited to situations where they'll experience heat, long periods of direct sunlight or abrasion. Thermal labels, tags or tickets can be 'top coated' to provide heat and scratch protection.

Not all materials are available to buy with a thermal coating. Plastic (synthetic) labels and tags are not widely available for thermal printing.

In summary, direct thermal printing produces sharp print quality with good barcode scanning ability but without the need for ink. If you don't need long life labels, i.e. for printing address labels, fresh food or tickets, direct thermal is a low cost, easy way to print.

Thermal Transfer

Thermal transfer printers use an ink ribbon which is melted onto the label by the printhead.



What does it mean for you?

- Thermal transfer makes it easy to print onto a wide range of different materials like polypropylene and polyester, for outdoor and harsh environments.
- Thermal transfer printing can be extremely durable – making it scratch, chemical and water proof.
- Labels printed using thermal transfer have a very long life making them perfect for asset labels, product labels and outdoor wristbands.
- Since you are using an ink ribbon, you also have the choice of a range of colours to print with.

With the right combination of labels and ribbon, you can make a label for any environment or application. Though it does cost a little more to print thermal transfer media, the added benefits ensure your label or tag is readable throughout its life without ever needing to reprint.

When Do you use Direct Thermal or Thermal Transfer?

We introduced you to Direct Thermal and Thermal printing. Here's where you'd use it.

What am I printing?	Direct Thermal	Thermal Transfer
Asset Labels		•
Address or shipping Labels	•	
Product Labels		•
Shelf/Location Tags		•
Wristbands (indoor)	•	
Wristbands (outdoor)		•
Receipts	•	
Tickets	•	
Waterproof labels		•
High temperature labels		•

Printer Types

The first question to help you choose the right printer is deciding where you'll be printing and what you plan to print onto. Let's answer that first question.

Desktop printers

These printers, as the name suggests, are smaller in size. Designed to work in smaller

spaces and print fewer labels than their bigger cousins. Desktop printers also tend to be less durable – made from plastic not metal. Whilst it's difficult to give an exact number of labels they're designed to cope with (labels differ in size) desktop printers are capable of printing on and off for an hour or so a day. That might be a couple of hundred labels each day. We typically supply retailers who print price labels, or a small business printing courier labels. Other examples would be small manufacturers printing product labels two or three times a week. Desktop printers print the same size and quality of labels as industrial printers (with a few exceptions), just fewer of them.

Best suited to:

- Small spaces
- Printing a few hundred labels a week
- Printing labels, receipts or tickets less than 110mm wide

Industrial Printers

Industrial printers are larger and more durable than desktop models, built to print more labels each day and work with less attention. Industrial printers are able to print from a few thousand labels per day to printing non-stop each day. These printers are designed to hold larger rolls of labels, tickets or tags than desktop printers so you don't need to change labels or ink ribbons as often. Industrial printers are fast – TSC's industrial printers can print at an eye watering 450mm (18 inches) per second. You'll find printers like the Zebra ZT230 in manufacturing and distribution centres as well as large retailers.

High end industrial printers have a host of features that make use of the printer's built in computing power. Printers can be programmed to print without computers or network support. Plug in a barcode scanner or USB (or Bluetooth) keyboard and print directly from the printer without the need for a computer. The Sato CL4NX uses near field communication (NFC) found on many smart phones for easy configuration. With the CL4NX you can pull data from the web to include in your printing without the involvement of any computer.

If you are printing any type of media in large amounts, your most reliable option are industrial label printers.

Best suited to:

- High volume printing situations
- Situations where print speed is important
- Rough handling situations
- Mission critical situations where down time is a big problem
- Flexibility and computer-less printing situations

Mobile

Mobile printers use the same thermal technology, but (as you might have guessed) are small enough to carry around and will print without cables. They connect wirelessly to your Wifi network or via Bluetooth to a handheld terminal. Models with USB cables are available and there are a few that still use InfraRed. Portable printers do have a few limitations due to their small size. They are not built to print high volumes of labels and tags because they have a small roll capacity. They're small – so they have narrow print widths – 100mm is the widest you can get, usually, narrower. One last limitation is that mobile printers are usually direct thermal only. Not so useful if you need long life asset labels – but OK for most other labels, and it reduces the weight of the printer.



What portable printers are excellent for is printing tags, labels and receipts on the move. A mobile printer provides you with high quality print in a compact package that fits in the palm of your hand (or clipped to your belt).

Use these printers for delivery drivers or sales agents to create receipts in the field or a warehouse worker that needs to make labels on the spot. These printers are not tied to a fixed computer, so you can connect to them wirelessly through Wifi or Bluetooth and use them with handheld computer (handheld terminal), or smartphone for printing wherever you go.

Best suited to:

- Printing at the point of transaction
- Situations where weight is a problem
- Access to power isn't always possible
- Printing small numbers of labels

Specialist Printers

Most of the time thermal printers print labels and label printers can be loaded with receipt paper, tags and tickets, but there are specialist printers – designed to print tickets and wristbands – making them very easy to use.

Wristband Printers

Even though standard label printers can also create wristbands, you can buy a dedicated wristband printer. If you're planning to print wristbands for a hospital, venue or theme park a dedicated wristband printer is the perfect solution.



These offer several advantages and in many cases a lower overall cost.

While standard printers have their media on a roll, dedicated wristband printers have cartridges that simply slot into place making loading fast and easy – so much so that training is virtually eliminated. These printers often have a print resolution optimised for clear, accurate printing of images or logos. If you're buying a hospital or healthcare wristband

printer then many models have a special anti-microbial case to meet the cleaning demands of your healthcare environment.

If you regularly print custom printed wristbands, a dedicated wristband printer like a Zebra HC100 would minimise training and be the most efficient solution.

Ticket Printers

Ticket Printing is another specialised area of on-demand printing where thermal printers are perfectly suited. Tickets are usually printed on thicker paper. If they're not perforated then they need a cutter fitted to the printer, so tickets can be neatly cut. Labels are often printed in 'fan fold' format. Specialist ticket printers have a taller case so they can be loaded with more fan fold tickets. If your tickets come on a roll then these printers can be fitted with a hanger. With tickets being worth their weight in gold, dedicated ticket printers, like the Datamax ST-3210 come with a lockable case.



How do you connect your printer to the outside world?

Every printer needs information in so it can print something out. It needs to communicate with a computer of some type to receive print jobs and label designs. While standalone is an option for some printers, you still need to connect to a PC to set-up the printer in the first place. The majority of printing applications however, still require a constant connection in order to receive it's printing commands.

USB (universal serial bus)

All of the desktop and industrial printers we sell offer multiple options for connectivity, with USB being the most common today. Any PC or laptop today will have USB connections and it is by far the easiest way to connect to your printer. Plug in the printer, install the driver on the PC and you're ready to print.

Serial and Parallel connections

If you have a special application or a piece of industrial control equipment to attach to, options for serial (RS-232) and parallel (Centronics) connections are still available for most printers.

Connecting to your network

With network connectivity being more important today than it has been in the past, Ethernet and Wi-Fi have become much more common in label printers.

When your printer has an Ethernet connection you simply connect a standard network cable to a network port and now it can be shared across your network. USB printers tend to be tied to the PC it's connected to and the PC has to be switched on in order to print.

Many of high volume industrial printers, like the Sato CL4NX, now come with Ethernet connectivity as standard, simply because of the convenience it provides.

The world is wireless

More and more of our clients appreciate the flexibility and convenience wifi and Bluetooth offer them with their computer equipment. Wi-Fi on a printer makes it easy to put it anywhere you like. Wifi is usually an extra option on thermal printers.

Portable printers are a special case since wireless connectivity is a must, by design. Whilst most mobile printers offer a USB cable connection, to get the full advantage of mobility, Wi-Fi or Bluetooth needs to be used.

Wi-Fi uses a wireless network to communicate just like a fixed printer. As long as you are within the radio range of the Wifi network access points (antenna) the printer will work but for fully mobile applications, Bluetooth is a better option. Bluetooth reduces your wireless range to 10m but works without a network since your printer and handheld computer or laptop talk to each other directly. Usually you'll have a computer or tablet in your hand and a mobile printer on your belt 10m range for Bluetooth is more than acceptable.

Label printer Add-Ons and accessories

Now you have a good ideas of the type of printer you need and how you'll be using it to print, it's time to look at accessories.

Most printers don't need any accessories or options – but many of these optional extras will save you time (and therefore money) and make printing labels a joy. Once you've used them you'd never consider going back. Most of these options are only available on desktop or industrial printers and specific add-ons will vary by model.

Cutter

A cutter does exactly what its name suggests. If you need individual labels cut from the roll once they're printed or you're using continuous rolls of material (such as with tickets) a label cutter is the answer. As soon as a label or tag is printed the cutter will slice through the gap between the labels and the individual label will fall onto a catch tray. With continuous label, printer or tag material the cutter will cut through the card or material and it will be caught on the catch tray. We had clients using a heavy duty tear proof tag, which, as the name suggests, was impossible to tear off. A cutter was the only way they could use these tags.

Printers come with a tear off bar – a serrated 'cutter' which enables you to take the printed labels and tear them off the printer. This is fine for most use. You're also able to buy perforated rolls of labels so it is easy to tear it off the printer but when you are using continuous or special media, a cutter is essential.

A word of caution – cutters can be unreliable if they're not maintained. They need to be regularly cleaned (especially if they're cutting through labels, as opposed to the label backing paper) so the label glue doesn't jam them up. The blades also need to be replaced before they become too blunt.

Label Rewinder

A rewriter comes in two versions: internal or external. A label rewriter one of those pieces of kit that once you own one, you wonder how you ever coped without it.

The internal label rewriter is a roller inside the printer that takes the labels you print and have them feed back inside the printer onto an empty roll. The finished result is a nice tidy roll of printed labels as opposed to a pile of labels in front of your printer. This option is invaluable where you're printing thousands of labels in large batches at one time.

The internal rewriter usually comes as a factory fitted option that you choose at the time you order your printer. Some printers can have label rewriter units fitted either by returning the printer to us or with an engineer visiting your site.

External label rewriter units as the name suggests is an external standalone motor with a roller. As the labels come out of the front of the printer they're rolled onto a cardboard core turning on the rewriter unit. It's a bit more complicated than that, with mechanisms that control the speed the rewriter turns and different sized cores to roll the printed labels back onto.

If you have several printers and you don't always need to rewriter labels – then an external label rewriter is the best solution, as you're able to set it up with which ever printer you're using. It takes a couple of minutes to set up but saves you lots of time if you're printing large batches of labels.

The alternative to a rewriter unit is to sit there rolling labels onto cardboard cores with your hands. It's oddly therapeutic but time is money and there's lots you could do whilst your label rewriter does the work.

Peeler/Dispenser

A label peeler/dispenser takes each label as it is printed and separates it from the backing paper. The backing liner is then fed back inside the printer and rolled back onto a core. The printer then presents the peeled labels for you to take and stick to your work. Label peelers are perfect where you're printing individual labels and then sticking them straight to a product immediately. The peeler saves the time it takes to tear off the label and then peel it. This seems fairly insignificant but if you're hand applying hundreds of labels a day then a peeler quickly pays for itself.

Note, however, if you print in batches a peeler isn't a good option since the printer stops printing until you remove the label from the printer after it has been peeled.

RFID – Radio Frequency Identification label encoding

RFID is a technology similar to Near Field Communication (NFC) you find on some smart phones. RFID is also used in many buildings where you wave a card or tag in front of a reader and the door unlocks.

RFID is making its way into label printers. It enables a label to be read electronically – without the need to actually ‘see’ a barcode on a label. With barcodes the reader must be positioned correctly in front of the label before it can be read. This usually (but not always) involves human effort. With RFID the RFID reader only needs to have the tag near it. The distance varies depending on the RFID labels or tags and the specification of the reader.

Other benefits of RFID is that RFID tags can be reused (by overwriting the data on the chip), they can encrypt the data – adding an element of security if you need it. They can read faster and the tags can store more data than barcodes.

The benefit of fitting an RFID encoder to a label printer is that you can print traditional barcodes for use by customers (who don’t have RFID) but at the same time encode the label with RFID data that you can benefit from with your own systems to use.

Some printers, including a few mobile units, offer options for ‘printing’ RFID based labels. With this option, you can print on the front of a label while encoding information into the RFID chip which is sandwiched in the middle of the label. RFID options vary depending on what frequency range you will be working with and most printers will support UHF or HF ranges.

RFID systems are complicated and need careful setup before you can enjoy the big savings they offer. Speak with one of our RFID experts to ensure you get the right printer for your RFID needs.

In-line Barcode Verifiers

From time to time barcode printers experience print quality problems. Ribbons wrinkle and printhead elements burn out. If you’re printing a barcode this can mean a barcode is unreadable. That’s a problem if you didn’t realise and you’ve just labelled up 2000 products and shipped them to your biggest customer to scan.

An in-line verifier is a special type of barcode scanner that mounts to the front of the printer. This scanner is analysing each label that is printed to ensure it meets specific print quality requirements. The moment a printer fitted with an inline verifier starts to make labels below the grade you set, the verifier will stop the printing process. You can fix the problem and know that you’ve saved yourself hours of work and hundreds or thousands of pounds in expense rectifying the problem.

A lower cost solution that’s not as decisive on the quality of barcodes (especially if there was a dispute with customers) is to scan the barcode prior to dispatch with a standard barcode scanner. If you want a solution that would hold up in a court of law then a portable barcode verifier could be used to test batches of barcodes for quality. Depending on your quality assurance processes this could prevent expensive mistakes.

When you are sending labelled products to large retailers they will have strict rules on the print quality of the labels you produce. The fines involved in not meeting their rules are often more than the cost of the verifier. Any business that has to meet any kind of print

compliance should seriously consider an in-line verifier for their printer to easily avoid the fines and headaches of poorly printed labels.

Verifiers are more than just barcode readers – they are precision instruments and need to be discussed in detail to ensure you buy something that will do what you need it to do. Call one of the Expert Labels team and let us help you choose the right solution.

How to Find the Right Printer

With all the information available, choosing the right barcode printer can be overwhelming. We hope this guide helps you choose the right balance between getting the job done and paying a fair price. If you are still having difficulty or have more questions, feel free to call our experts 01359 271 111 - we're here to help you find the right printer for your needs and enjoy the opportunity to help you.