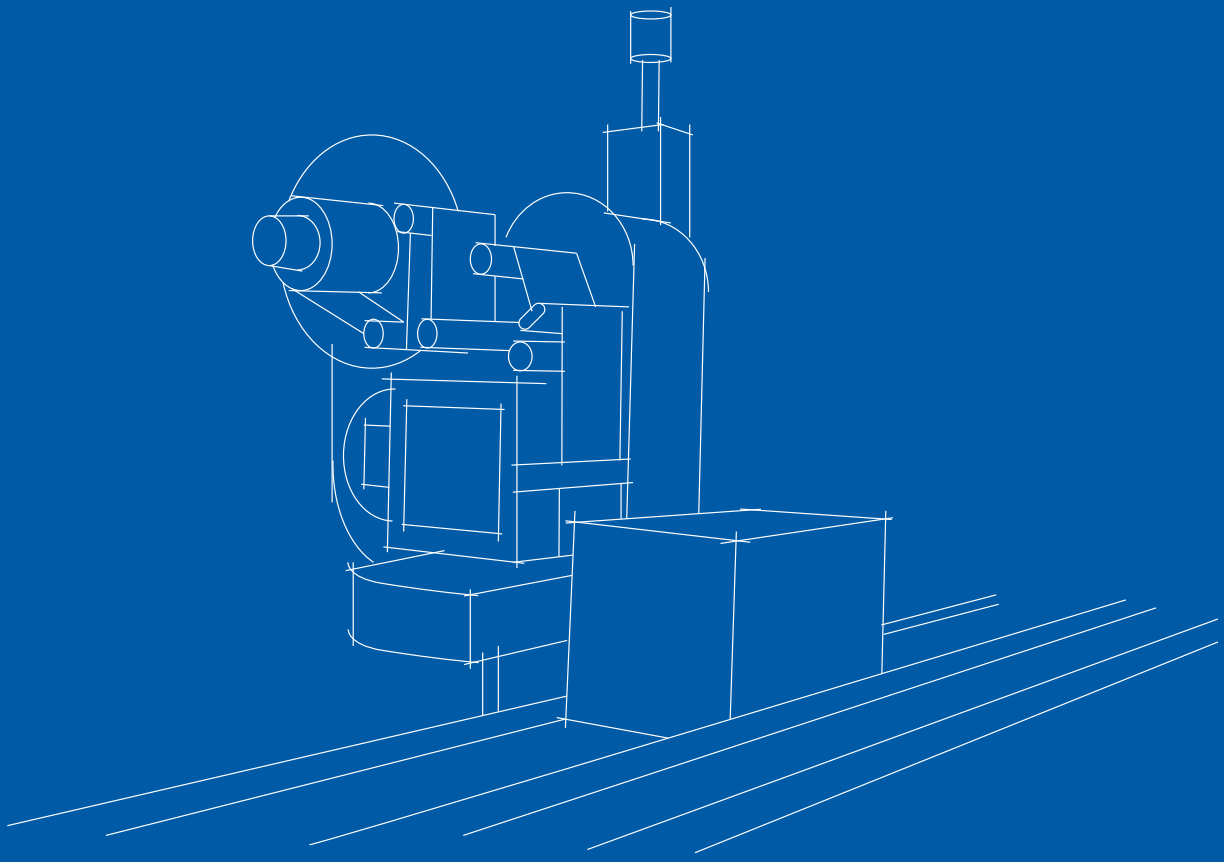
COBALT SYSTEMS

Print & Apply Guide



Barcode | Labelling | Automation Est. 1997

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Print and apply barcode labelling automation

What is print and apply technology?

Production lines tend to be optimised to run at high speeds to maximise the potential output of a manufacturing facility. That extends to fixing identification labels to the outer packaging, although as it happens at the end of the production line, it is sometimes overlooked.

Relying on anything other than a dedicated machine to carry out this task leaves manufacturers open to significant risk.

To overcome this risk, print and apply labelling solutions enter the equation. In its simplest form, a print and apply machine prints a label containing data relevant to the product on the line and applies it to the traded unit's outer packaging as a single action. It prints and applies.

A well-configured, high-quality machine helps ensure the label is always applied, always legible, printed to a high standard and applied in the same location (or locations) to satisfy the needs of specific industries.

But really this is just scratching the surface. Labels often contain barcodes but can be so much more. Graphics, variable data (e.g. best before dates), QR codes, ingredients, personal information or pretty much any other type of data can be applied in real-time to a label and securely affixed to your packaging. Be that a case, a shrink-wrapped outer pack, a pallet, a keg, a barrel or a box (and in one or more places). And it all happens automatically.

So while the principle of print and apply is relatively simple, when the complexities of unique product lines and environments are considered, there are lots of factors to bear in mind when specifying a solution.

Does my business need a print and apply solution?

The first question to ask is do you actually need a machine to carry out this task? Well, before the invention of machines that were capable of automatically printing a label and sticking it onto some form of outer packaging, the whole process had to be done by hand. And there are many manufacturers for whom a manual approach is still the preferred labelling operation type.

But there are a host of reasons to consider barcode labelling automation as an alternative.

Consider a small manufacturer with a relatively low level of output and a limited number of products produced and packed on the line.

Such a scenario is one of the few production line environments that could be suited to a member of staff printing each label in turn, and hand applying it to a case, pallet or some other type of pack. But even with low throughput, hand applying is still a questionable approach.

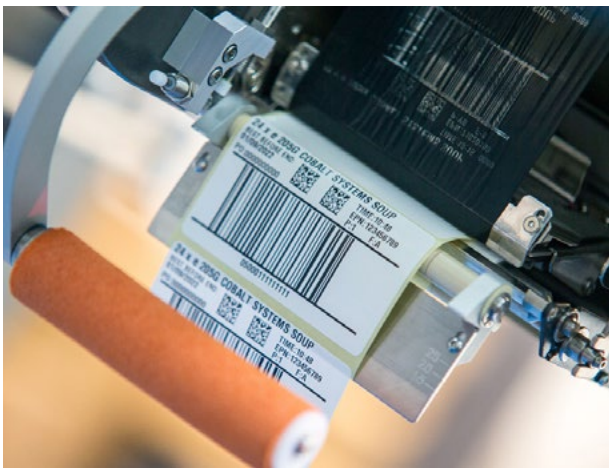
It requires one or more individuals to dedicate at least a period of each shift to printing out and sticking on labels when they could be doing something else. At the very least it's an expensive use of human resources, but more troublingly it relies far too heavily on the weakest link in the chain...people!

Unfortunately, people are flawed. They get lazy, tired and bored. And a repetitive low-skill task is precisely the sort of environment where less favourable human traits come to the fore.

Plus it's hard to scale up if you're reliant on a human resource for printing and applying labels. But with a machine that can cope with thousands of labels per hour, scaling up is rarely a problem.

In a larger production environment, where the number of products and labels is higher and changes are more frequent, then the risks grow exponentially. For most manufacturers there comes a tipping point when a machine is simply a more viable option.

And just because barcodes and labelling are at the end of the production line, it doesn't make them any less important in the grand scheme of your manufacturing process. In fact, quite the opposite, because if you get it wrong, there can be disastrous consequences.



So why is barcoding and labelling so important?

There are several very good reasons why it's important to get this right. Take the food and drink industry as an example, the key reason is traceability, both internally and in the wider supply chain to allow for products to be traced in the event of a recall or the withdrawal of a product from sale.

Traceability is not just a 'nice-to-have'. EC Regulation 178/2002 is the legislation governing the traceability of food and beverages in the UK and the rules are very clear. According to the Food Standards Agency website:

> *To achieve the fullest traceability of food products within a food business operation or between stages in a supply chain it is essential to identify the product unit concerned (batch, lot, consignment, etc.), and provide some form of data carrier facility for maintaining identification of the product unit.*
>
> *A range of data carrier technologies are available to support identification of various levels of sophistication. Perhaps the most widely used and recognised in the food industry is the linear barcode.*

This requirement is true for many other industries too. Barcodes are also universally recognised and allow for companies to quickly onboard products. Put simply, your products need to have a barcode.

Not only can mistakes in barcode labelling have dangerous consequences in terms of breaching traceability laws, but errors can also prove very costly in terms of business relationships.

Major UK retailers have historically taken a very dim view of incorrectly barcoded and labelled goods from suppliers, to the extent that three separate deliveries with errors will render you ineligible to supply that retailer again.

So, not only do you need a barcode, it needs to be accurate and it needs to be right.

What are the different types of print and apply machines?

There is a wide range of print and apply machinery and solutions available to fit the needs of any production line. Solutions can be configured to apply single or multiple labels on one, two or three sides of an item.

The application surface determines the type of machine best suited to each scenario. Different application methods are deemed more appropriate for softer, smoother, rougher or more rounded products, and the best solution is not always the most obvious.

Print and apply solutions can also be configured to provide a continuous operation function for extremely high speed, high volume production lines. In this configuration, a second or third machine will automatically take part of the workload if one machine is not sufficient or an issue occurs with label media or print head. In such a case, the line will continue to run regardless of any problems, making it a failsafe operation for when unplanned downtime is simply not an option.

Beyond the primary function of printing and applying labels, a well-thought-out solution will also include in-line quality inspection. This means each item on the packaging line is checked to ensure a label exists, and that it is the right label. This additional step offers considerable peace of mind for a manufacturer in removing issues with incorrectly labelled or shipped products.

The exact requirements of a print and apply solution are very much dependent on the operating environment, and there is a range of factors to consider.

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Choosing the right machine and tools for your production line

Labelling requirements (label position & quantity)

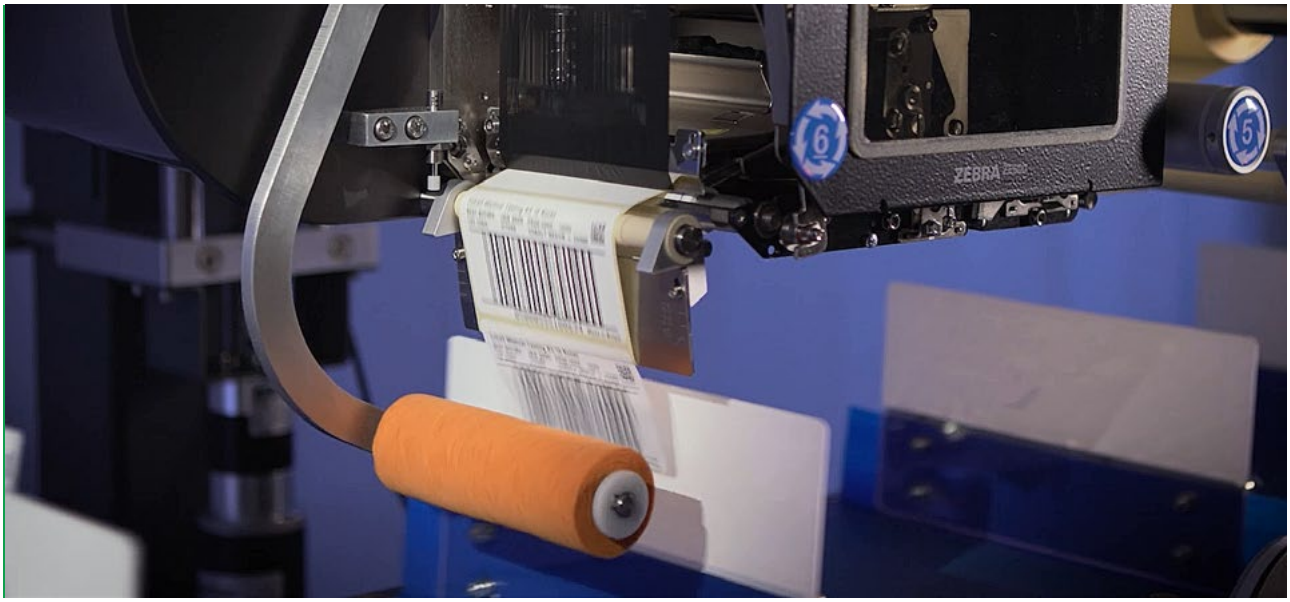
Different industries have different barcode labelling requirements. Whether adhering to GS1 for retail or ensuring your pallets are SSCC (Serial Shipping Container Codes) compliant, it's usually business-critical to get it right.

Added to that mix are the individual requirements of specific customers who might require a particular configuration of labels. So, the first thing to establish is where you need to apply labels on your outer packaging and how many you need to apply.

Our range of print and apply machines can print on one, two or even three faces of outer packaging in a single step.

Our standard configuration machines can print and apply barcode labels as follows:

- Top only
- Front only
- Side only
- Bottom only
- Top & side
- Two adjacent sides (a superior solution than a wraparound label)
- Front & side
- Three sides (of a pallet)

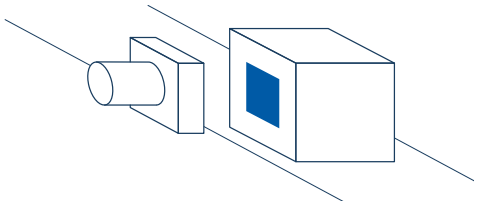


Type of product and packaging material

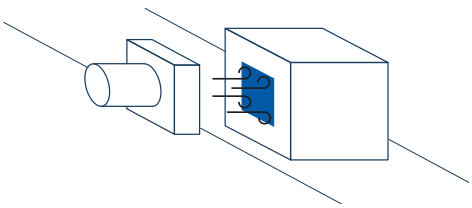
Once you know how many labels need to be printed and where they will be applied to your packaging, the next step is to determine how the label will actually be stuck on.

There are various methods which can be used to apply an adhesive label. These include:

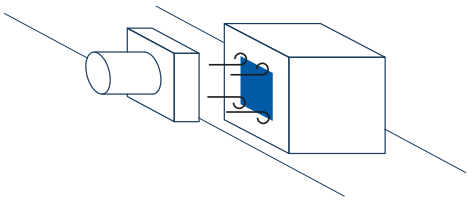
Tamped: Physical pressure is applied – either by the machine mechanism or the movement of the outer packaging against the machine as it moves down a production line.



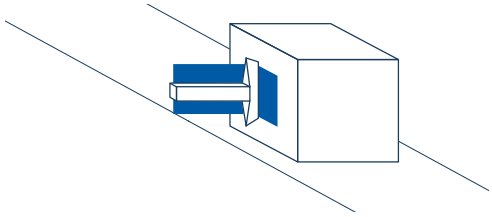
Air blown: The label is held in place on the non-adhesive side using a vacuum of air which is then reversed to blow the label onto the packaging surface.

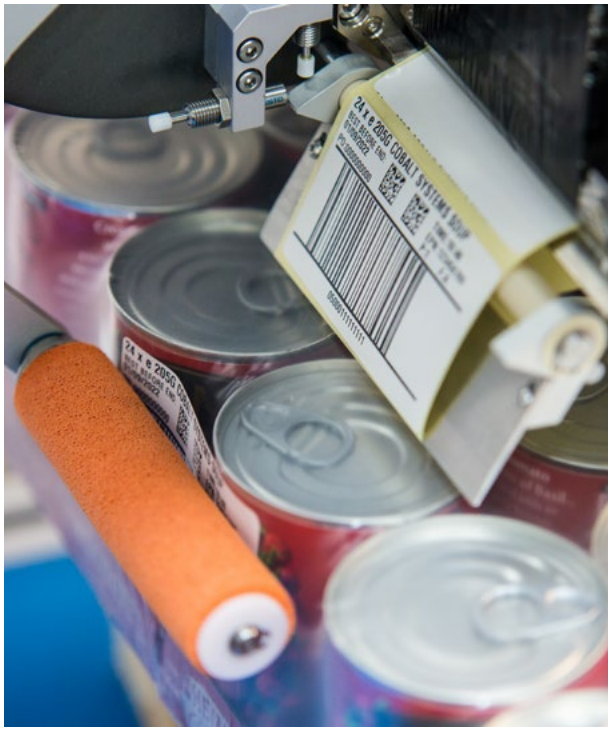


Air blown & tamped: Combination of the two methods described above.



Wipe on: Labels are dispensed off a beak directly onto the product and pressure is applied (often by a roller) to ensure adhesion.





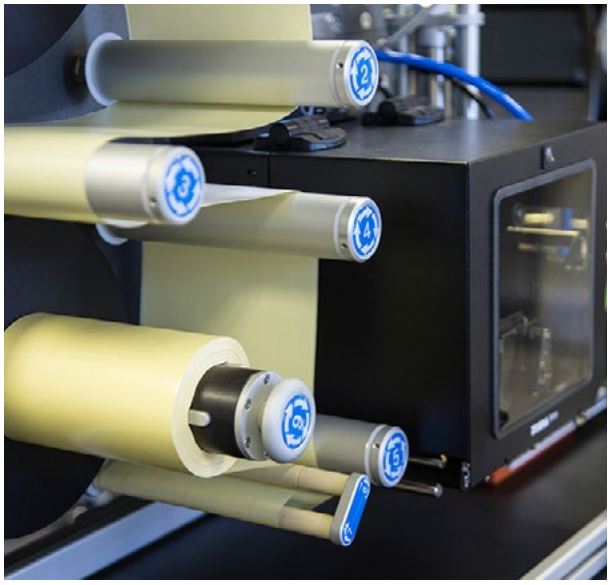
The correct method is often dictated by the surface texture and material of your outer packaging. For example, rougher surfaces typically need to use a tamp application method to ensure appropriate adhesion, as might a non-flat surface or 'lumpy' products (imagine a plastic bag of loose components).

Air-blown applications tend to work well where the arm of a machine is required to move to meet the face of the outer packaging, as the air vacuum holds the label securely in situ under movement. Tamping can be added when the packaging material is not smooth enough to ensure adequate adhesion by air blowing alone.

For irregular or rough surfaces, a foam pad keeps the label's face wrinkle-free but absorbs irregularities in the packaging surface.

Machines dedicated to specific materials and surfaces also exist. For example, our Drum Printer Applicator is designed specifically for printing and applying large synthetic labels that meet Global Harmonisation Standards for chemical-based products (GHS).

One important consideration is whether or not you use compressed air in your production facility. If not, then we have a range of all-electric print and apply machines that be configured for your production line.



Variety of packaging/ outer cases

The variations of outer packaging types you use can have a significant bearing on the best type of print and apply machine for your business.

In a simple environment with a small number of outer pack sizes that only change infrequently (e.g. 12 unit packs manufactured Mon-Wed and 6 unit packs Thu-Fri), it's simple enough to stop the machine and switch the configuration to cope with the change in outer size.

But if you have a range of different sizes, then more advanced options can work in your favour to increase automation and remove the need for human resources.

A straightforward configuration might be a mechanical switch that allows an operator to choose between single-sided or two-sided labelling without stopping the machine and the line. This is an ideal set-up where the same product is shipped to different customers with different labelling requirements.

An advanced approach is when our machines use a 'recipe-driven database'. This is achieved by pulling live information from ERP software to automatically identify a product type on the line and then printing and applying the correct number of labels in the right location, all in real-time.

Speed of production line throughput (and impact of downtime)

One of the most essential factors in determining the correct machine or solution for your business is the speed of your production line and the impact of unplanned downtime.

There are various methods available to accommodate higher speed lines, which can either be specified from our standard range of machines or be built as a bespoke solution.

With high-speed packaging lines, there tends to be greater uniformity of product size, particularly in an FMCG environment, so it's possible to deal with high volumes on a fast line by using an applicator in a fixed location. In addition, removing the need for the applicator to carry out a movement to apply a label removes time to apply and therefore means you can print more and apply more.

However, the system will need media replenishment, preventative maintenance such as cleaning and corrective action in such a case where a barcode label is detected as substandard.

In some production environments, the time it takes to overcome such issues won't be a problem. Product can be allowed to back up and get up to speed again over time. But for many organisations that's not the case.

When specifying any part of your line, it's prudent to ask yourself some difficult questions...

- How much would it cost if the line went down for 5 minutes, an hour, half a day or 2 days?
- What would the knock-on effect be on deliveries and customer relationships?
- How quickly can I get my line back up and running?
- Can my own team fix the issue or do I need a service technician?

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On a 24/7, high-speed production line, any period of downtime can have a significant impact on output and a machine that is supposed to deliver savings, rapidly starts to become a cost. To counter this, we offer a continuous operation system that provides many benefits.

Rather than rely on a single print head on a machine, our Continuous Operation Machines usually feature two or three print and apply heads but this number can higher. This feature allows a production facility to counter all the potential causes of downtime and increase production output speed safe in the knowledge that the line will be able to cope. It works by allowing the additional print and apply heads to automatically activate when required.

Optional in all Cobalt's systems is onboard barcode verification for barcode quality control. This is usually specified into continuous operation systems. When a fail code is detected it is never applied to the product. Instead, it is held on the pad and the secondary head automatically takes over.

It is also equipped with machine vision and industrial scanning technology, to check that the already verified label has been successfully applied to the product and still reads correctly, if not the secondary units take over to reapply a new label.

Equally, if the primary print head runs out of labels, the secondary machines take over while the primary machine automatically withdraws itself from the line so new media can be added.

While a continuous operation machine is more involved than a single unit, it provides absolute peace of mind against increased line speed, unplanned downtime and automatic self-correction of incorrect labels. These machines are the platinum standard for environments where downtime is simply not an option.

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What to consider when specifying a barcode labelling automation solution

People: operators and engineers

It might sound like an odd first thing to consider given that a print and apply machine is intended to greatly reduce the need for human intervention...but as with any automated process, there is always some level of human resource required.

In the case of a print and apply solution, this means operators and engineers. Operators are typically given simple tasks like replenishing the print media when labels run out or selecting a new label when the product on the line changes.

None of these need necessarily be complicated tasks to complete, but if your operator is not very hands-on with technology or may not be a native English speaker, then simplicity is fundamental to a successful solution.

We embrace this requirement when we design our machines. For example, when it comes to rethreading a roll of labels onto a spool, the threading path is labelled with numbers and arrows at each location, so it's child's play to follow.

Equally, our touch screen control panel uses our proprietary software which is incredibly intuitive and simple to use, plus the panel itself is built into the body of the machine where it can't be bashed or knocked and there are no trailing wires to be caught or snagged.

From the point of view of an engineer, we know how important it is to keep a production line running. So we make our machines as robust as possible. In fact, we offer a 3 year warranty as standard to provide peace of mind.

But things go wrong and it's important that when they do, they can be resolved quickly. Having been in the business of print and apply for over 30 years, experience tells us that when there's a problem with a machine, in almost 90% of cases, it's due to the print engine.

So, our machines are designed to allow your own engineer to change the print engine in less than five minutes, removing the need for costly service engineer call-outs.

Usability and ergonomics

Still, on the subject of human interaction, there's another consideration for a label application machine. It's important that your operators like the machine they use. And it's for that reason we put a lot of thinking into how our machines will be used.

For example, there are no sharp edges on the chassis or frame, so the likelihood of accidentally cutting yourself or bashing a shin or elbow is much reduced. Loading for labels is also at a sensible height so it doesn't put unnecessary strain on the operator's back.

As standard, our systems also come fitted with a highly visual traffic light beacon system. This is to allow operators to easily identify if a machine is running as expected, if an issue is pending or if it needs immediate attention. Coupled with that are optional siren sounders, perfect for noisy factories to grab attention.

Our belief is that if a machine is easy to use and doesn't cause operators unnecessary aggravation, it will be treated more kindly, will therefore last longer and deliver even greater ROI.

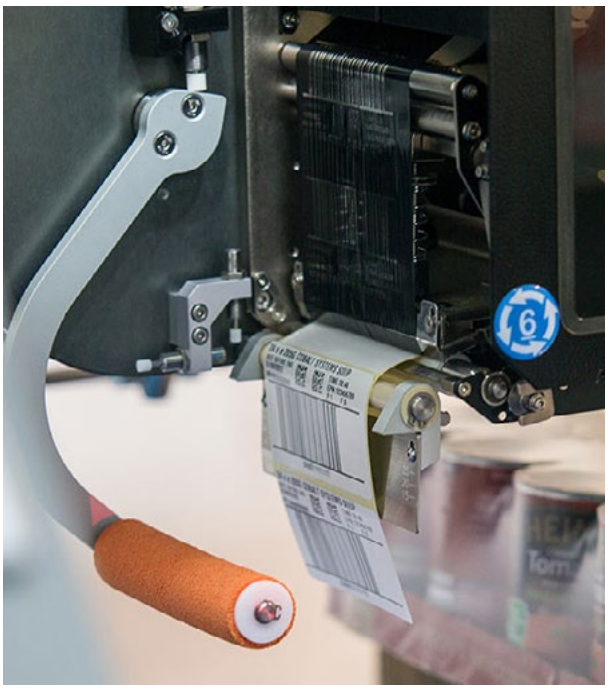
Integration with other parts of the production line

It's an unfortunate fact to acknowledge, but because barcode labelling tends to come at the end of the production line, it is often the poor cousin in terms of consideration and investment.

Which is actually a bit back to front. Because if there's a problem with your labelling, the whole line either comes crashing to a halt or production starts to back up.

How you go about dealing with unexpected issues with your labelling process can have a huge impact on line efficiency. As standard our Nexus range of machine offers a Volt FREE signals configurable I/O.

This means that a signal can be sent to any other machine(s) on the production line to notify of an issue that can trigger a warning, completely pause or just slow the line down.



This removes the risk of a clogged line and mislabelled products and is built in as standard. Other machines tend to operate with a simple yes/no function and offer no nuance to enable the solution to work in tune with other elements of your production process.

Operating environment

Manufacturing facilities differ enormously in terms of the physical environment. Some are meticulously clean and spacious, others... less so!

It's very important to consider the following when specifying a solution:

- Will your print and apply system need an enclosure to protect it against dusty, dirty, wet, hot or cold environments?
- How much space is available to house a system?
- How much space is needed to allow for easy access to media replenishment and maintenance tasks?

It's such an important aspect of specifying a system, but one that can be overlooked particularly if things are not as obvious as they seem.

On one occasion, a customer was experiencing difficulties with label adhesion, but only for a few hours per week in winter. It occurred when deliveries were made to the factory. Shutter doors would be left open and the temperature dropped significantly, causing the problem. An enclosure was retrofitted which solved the problem.

What about access? If you are fortunate enough to have a lot of space, this won't be an issue, but in more confined environments, it's good to consider how best to place and configure a machine to provide the easiest and safest setup.

A comprehensive review of where your labelling process will take place can identify requirements at the outset of a project making everything a lot smoother from the outset.

Installation and commissioning

The level of downtime you can comfortably afford on your production line can have quite a bearing on how you go about installing a print and apply solution.

Assuming it is an existing line, then there is always going to be some level of disruption, but by considering the options at the start, it's possible to bring this down to the very bare minimum.

The easiest way to achieve this is by opting for an integrated solution that includes a conveyor section, which can be built to size to entirely replace an existing section of your production line.

That allows for the entire operation to be built, configured and tested with live products and data before it even reaches your facility. Any issues can be ironed out ensuring a much smoother implementation and drastically reducing downtime.

Software: User Access Control

Sometimes the best intentions can cause big problems. For example, when somebody with not quite enough experience or training tries to 'do the right thing' and ends up making it a lot worse.

That's a common problem in a fast-moving production environment, which is why we introduced tiered User Access Control in our software solutions. It's a configuration option that permits different user roles to make different types of adjustments.

An operator user role will only be able to stop the machine to replenish media or change the output print when switching to a new product. Whereas an admin-level user who has been appropriately trained can make wholesale changes.

Quality Control

For any manufacturer, the quality of the finished product is paramount. Nobody wants rejected goods sent back after all. That point of failure can often be traced to how products are barcoded and labelled. Incorrect, missing, badly printed or even poorly applied labels can all cause product rejections.

To counter this, your production line needs a robust and effective method to carry out two checks. The first is to see if a barcode has been printed and applied correctly and is legible. The second is to cross-check the product itself and the label to ensure it is the correct barcode.

In an ideal world, that activity needs to take place in real-time in order that any issues are identified immediately and can be dealt with.

If not, you have two serious problems to contend with:
a. identifying the start point of the issue and
b. rectifying it.

For example, if a large volume of finished products has been incorrectly or badly labelled, first of all, you need to know when the labels started going awry. Have ten packs or cases been affected, a hundred or even a thousand? Have any of these been shipped?

A simple way to identify and locate the first 'bad' label is needed so you can reapply correct labels.

When considering a print and apply solution, ask yourself what are the implications of a product being shipped with incorrect or poor labels? And how would you deal with rejected products?

Our Sentinel two-stage Validation and Verification option works across our range of Nexus Print and Appy machines and mitigates this risk entirely.

Futureproofing

A print and apply solution can be a substantial investment and to get the most out of it, it's important to consider not just the here and now, but your future plans:

- What products might you manufacture next year or the year after?
- Will it always be on to the same finished pack or case type?

Thinking about that now can futureproof your investment by making sure you have a machine with the capability to deal with different heights, label sizes, positions and quantities.

All our machines are height adjustable by default with no need for tools. We can also configure machines to use a database-driven recipe function to automatically apply labels to different size packs or cases, triggered by proximity sensors.

The possibilities are wide-ranging but require due consideration at the outset.

Throughput, throughput, throughput

A large number of the factors to consider when choosing a print and apply system centre on how much you can afford downtime on your line and the knock-on effect on throughput.

Whether that's caused by low operator skill level, incorrectly labelled product, unscheduled maintenance requirements or a missed error, any downtime means potential lost revenue.

We take all our prospective customers through a Barcoding Discovery Session to identify any issues that will impact the design and implementation of a successful print and apply solution. That way we can be absolutely sure you get a system that is fit for purpose and built to work for your business.