

Key factors to consider when selecting a laser coder

Is laser coding the right solution to address simple coding needs?



Introduction

Laser coding is a fast, permanent and extremely reliable solution that is able to handle a variety of applications across a multitude of substrates.

So why isn't it used more frequently in simple coding applications?

Laser has not always been perceived as an accessible or pragmatic coding solution for multipurpose use and instead has a reputation for being applied to more specialist or complex coding scenarios. Based on this fact, small and medium sized independent packaging companies who depend on cost of marking, re-jobbing flexibility and quick set-up times felt hesitant to adopt laser into their packaging process.

Recent technology advancements and innovation in product design has opened up a new door, making the option of laser coding a very real and attractive prospect.

There are a number of questions that as a producer you should ask yourself before making the decision on which coding product is the best suited to your application. Improperly applied, the coder selection can be a source of frustration that can drag down the speed and productivity of packaging operations. Properly specified and selected, the coder can and should be an important, yet unobtrusive, element within your packaging line operations.

This paper will focus on the factors to consider when choosing a laser coding system, in particular the historical challenges faced and how they can be addressed.

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The benefits of Laser Coding integrity

Laser marking can be a simple and versatile method of coding.

Code capability makes it adaptable to various applications with dot matrix, barcodes and scribed images all suitable. Marking reliability and consistency is excellent, and the range of substrates laser can code is significant.

- **Cardboard**
- **Plastic Materials**
- **Paper Items**
- **Wooden and Metal Materials**

Plus other materials used in the consumer packaged goods and industrial products markets.



An advantage of laser technology is the non-contact feature which tolerates package shape variability as well as varying coding locations. In addition, lasers can mark on the fly or when the product is in a static position – unlike some other coding technologies.

Laser marking can achieve various results on your product:

- Colour change as a result of a chemical reaction between laser and product
- Engraving of the surface, e.g. burning into PET or etching into glass
- Ablation or removal of the surface coating to reveal alternate colour underneath



Now you know what laser is capable of, how do you identify if it's the right product for you?...

Identifying the right product for you

When contemplating the purchase of a laser coder, you must ask yourself the below questions:

1. **What material am I coding onto?**
2. **What result do I want to achieve with my marking?
(for example colour change, engraving or ablation.)**
3. **How am I currently handling and transporting the product?**
4. **Where would I like to integrate the coder onto my line?**

In asking these questions you help us determine the below factors:

- Which laser source is best for the given substrate
- The appropriate power level and focus lens for the given product and packaging line.
- At which point in your packaging process handling will we mark the product.
- How to prepare for overcoming the integration hurdles on your line, including set-up and operation.

Let us explain why this is so important.

Which laser source is best for the given substrate.

The materials being marked – the substrate – should be the first consideration of criteria. There are a number of different laser marking systems with different levels of capability so selecting the right one for the application is key.

In most consumer packaged goods, the substrate will be paper, cardboard or plastic and to a lesser extent, metal foils. In these applications, the laser mark most suitable would be ablation using either a CO₂ or Fibre laser to physically burn the top layer of material. For a quality code contrast, it is commonly required to modify packaging with a print window of dark ink, often referred to as a “flood fill”. The laser burns off the top layer of dark ink to expose the lighter underlying substrate.



Identifying the right product for you

The appropriate power level and focus lens for the given product and packaging line.

Providing the correct Laser specification is entirely dependent on the substrate, how much information will be coded and how the surface reacts to the laser. This in turn will dictate which laser is suitable, what lens is required and the intensity of power needed.

Knowing the correct production data is critical to determine how much energy should be applied, so the laser achieves the mark result that you want.

It is always best practice to produce a sample to ensure the correct specification is selected.



At which point in your packaging process handling will we mark the product.

Like other coding technologies laser coders require smooth, vibration free transport of the substrate for the highest quality marked codes. Proper integration into the packaging line with stable mounting hardware helps ensure that line vibration is not improperly transmitted to the coder during operation.

Lasers can operate in continuous and intermittent (stop and start) packaging operations, and this feature provides the flexibility of using lasers to mark on either moving or stationary packaging.

Another way that lasers are a flexible coding solution pertains to the allowable distance between your product substrate and the laser coder. The 'throw distance' can be bigger and variation in product placement is flexible due to the large marking field.

How to prepare for overcoming the integration hurdles on your line, including set-up and operation.

Historically, the integration complexities with mounting lasers has diminished the appeal of using laser coding. While it is important that integration is done correctly, it should not be considered a complex or difficult process.

Over the years, Videojet has observed that laser coders have been less favoured within the industrial market because of the integration hurdles inherent in mounting, operating and repositioning a laser coder on a packaging line. Some of these burdens include:

- **Time consuming install due to large, multiple components**
- **Difficult to move coder on line or to a different line**
- **Complex to set-up, create jobs, and operate in high changeover packaging operations**

Until now, the majority of lasers have been installed in applications where the benefits have far outweighed the integration hurdles described earlier. An example of these applications, PET bottle coding for beverages is one application where laser has been broadly adopted. The long production runs, the consistent substrate, shape and size, and low changeover have been ideally suited for laser installations. In contrast, lasers have been less commonly adopted for small and medium size operations where short runs, high changeover, and frequent repositioning of the laser have been challenging with more traditional laser designs.

Evolution of lasers

Over the years, Videojet has observed that while many customers expressed an interest in the mark quality and versatility of laser coding, many small and medium sized operations were selecting alternative technologies that could be more easily deployed to the packaging line. To address this gap, Videojet developed a novel laser that provided three key enhancements to traditional laser designs, each particularly suited for small and medium sized operations:

1. **Quick set-up and operation specifically for product and line changeover**
2. **Compact and versatile to aid coder repositioning**
3. **Excellent mark quality across a range of common applications**

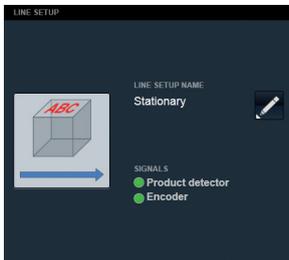
The Videojet 3020 laser marking system directly addresses the hurdles that have held back adoption of simple laser coders in a range of customers and applications.



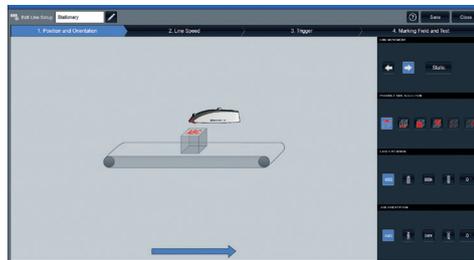
New innovation for entry level lasers

1. Quick set-up and operation specifically for product and line changeover

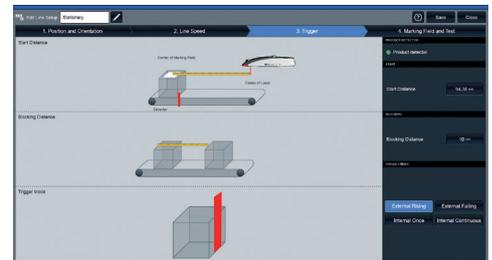
- 30 minute mechanical set-up and the laser can be repositioned from one line to another in as little as 20 minutes
- Intuitive touchscreen tablet for operator interface – provide maximum ease of use and reduces operator errors
- Smart ‘focus finder’ for simple adjustment of working distances and automatic encoder and product detect signal
- Set-up wizard provides creation of new code, new product, or new location on the production line in a matter of minutes



Visual representations make the set-up intuitive.



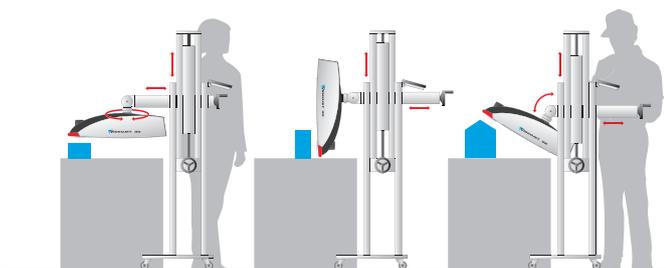
The Videojet 3020 interface shows product mark and movement.



Automatic signal detection for line speed makes set-up easy.

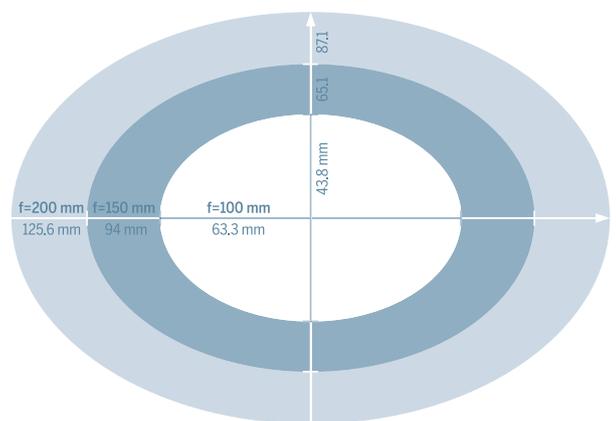
2. Compact and versatile to aid coder repositioning

- The compact, all-in-one design is 65% smaller than the average size of comparable 10W CO₂ laser coders on the market
- At 7kgs, the weight is 60% lighter than the average competitive 10W CO₂ laser coders – allowing for easier repositioning by a single operator
- Versatile stand and bracket design allows manoeuvring on line or between lines for quick change over
- Compact design allows easy repositioning for various marking locations



3. Excellent mark quality across a range of common applications

- Compatible coding on a wide range of substrates
- Scribing laser technology provides clear, high quality marks on both stationary or moving products
- Largest marking field (up to 126 x 86mm) makes almost all applications and codes available



A 'was/is' comparison of laser coders in the packaging process

Was: Existing common practice



Set-up head rotation:

0°
90°
80°
270°

How many set-up parameters can there possibly be?



On-site applications expertise

In the early days, marking specialists were a critical consideration in shift planning and job set-up. Specialist Staff Engineers are not an option for small businesses.



1 hour line changeover

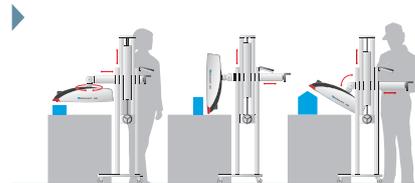
An entire shift could be allocated for set-up installation, conveyor interface and network connection. Re-location to alternative lines not a practical operational option.



Network comms and security set-up

Code content and other parameters delivered via network connections

Is: The New Environment



Diagrams aid the guided path for job-changeover. Only suitable settings are selectable.



On-line applications support

On-line help, including set-up parameters are available 24/7.



20 minute line change

20 minutes out-of-the-box installation or line switch over. Job changeover time ranges from nothing to very few minutes.



USB

The Laser marker only needs the code file. All parameters can be loaded to and from a USB fob.

What could be more simple?

Conclusion

“Does laser technology provide the right solution to address day-to-day coding needs?”

If you want a simple, small, uncomplicated and versatile coding solution that provides consistent quality codes onto almost any substrate then the answer is “YES”.

Remember – Laser coding is not a panacea for all materials, so a trustworthy and knowledgeable application review should be carried out. Samples need to be completed and assessed against known production settings.

If you have previously rejected laser coders as a serious contender for product coding, maybe it's time to reconsider...

Why work with Videojet for laser coding applications?

Videojet is able to offer you the largest network of sales and service departments as well as expert laser specialists in all major geographies. Our laser experts can help with application consultation to evaluate substrate suitability and best laser selection. With manufacturing plants on three continents, we can ensure fast supply chain to meet your needs in the time you require.

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