

Sector – Food & beverage

Laser coding solutions for the food and beverage industry

Today's consumer is faced with a wider choice of food and beverage products, from more brands than ever before. As competition increases, so brands introduce new ranges in the battle to retain and attract customers. Behind the scenes, it means production lines and coding solutions must be faster and more flexible than ever before to enable manufacturers to react quickly, implement production changes efficiently and keep pace with brands' evolving requirements. Meanwhile, product codes are becoming more complex – the use of 2D codes for instance

has increased significantly – and the average code length is likely to increase from 30 to 60 characters in the near future.

Achieving this with fewer operators while also reducing maintenance and delivering higher quality codes to meet traceability standards, prevent recalls and enhance brands' packaging, requires the most innovative and reliable laser coding solutions available.

Now let's examine the challenges and solutions available, in more detail.

The technical challenge of modern production lines

The increase in production line speeds combined with the quantity of information to code products with, means that laser coders now have far less time to cool down while in use. Known as the "application duty", the period that the laser is actually coding a product, has increased from 50% to 80% in recent years.

In addition, the ambient temperature in many manufacturing plants will vary significantly, particularly in the summer months when it may be particularly high.

Without an effective cooling system, this temperature variation can weaken the laser source power and impact negatively upon print quality. In combination with the increase in application duty, high ambient temperatures can rapidly cause laser coding solutions to overheat. This will damage the laser source and limit its lifetime. Such overheating will also result in a minimum of 15 to 30 minutes downtime, severely affecting production line efficiency and incurring unnecessary costs.

The advanced mechanical integration seen on

modern production lines also means that laser coders must be capable of operating effectively in dusty environments and situations where the laser printhead may come into contact with liquid projections.



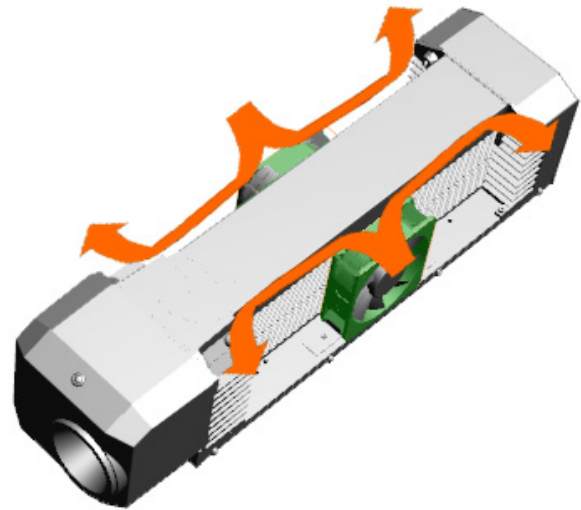
Product identification codes have already doubled in length in recent years to an average of 30 characters – it is likely that many will soon be twice this length.

Smarter, faster and safer

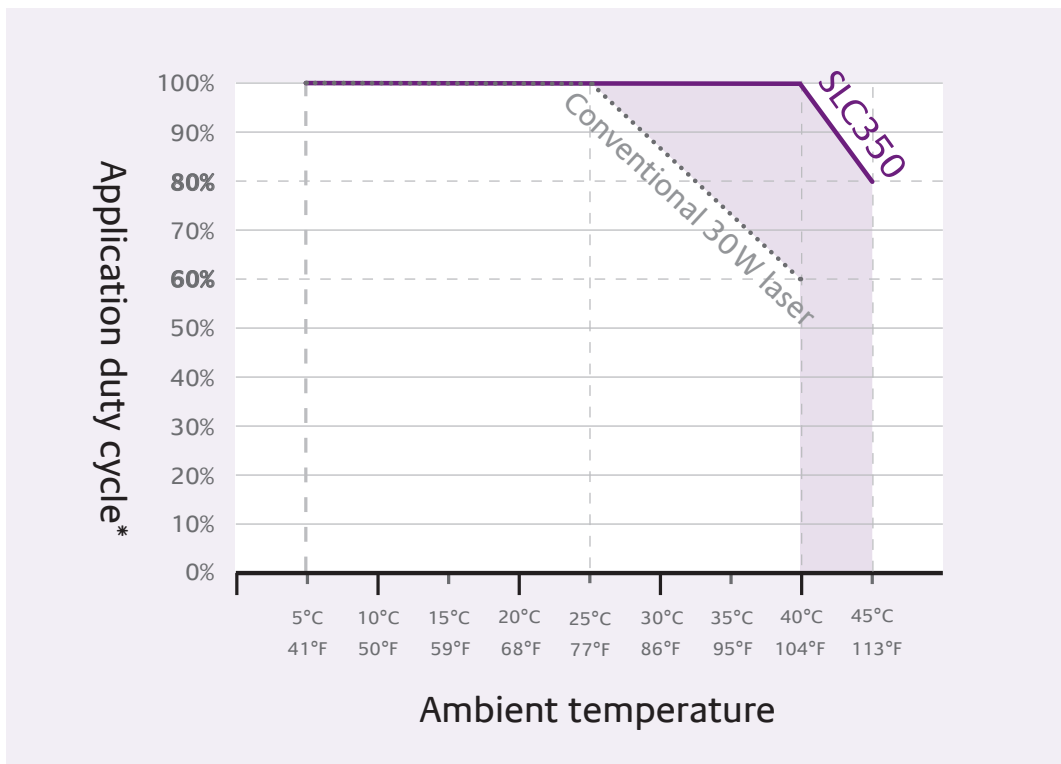
Delivering a coding capacity of up to 1,400 bottles or 600 packs per minute and the capability to mark codes of up to 60 characters while operating 24 hours a day, seven days a week, SmartLase coding solutions from Markem-Imaje have been engineered specifically to meet the challenges of the fastest production lines.

A unique cooling system, which features two central fans in addition to heat dissipaters at the front and rear of the coder, provides balanced cooling across both the laser source and the scanhead (see picture 1).

As a result, this system enables SmartLase solutions to operate effectively within a wide ambient temperature range of 5°C to 45°C and with application duty cycles as high as 80%, without any adverse effect on code quality and no downtime. In contrast, many conventional laser coders can only operate effectively at up to 40°C with application duty cycles limited to a maximum of 60% (see picture 2).



Pic 1. The unique cooling system of the SmartLase C150/C350 provides balanced cooling across both the laser source and the scanhead.



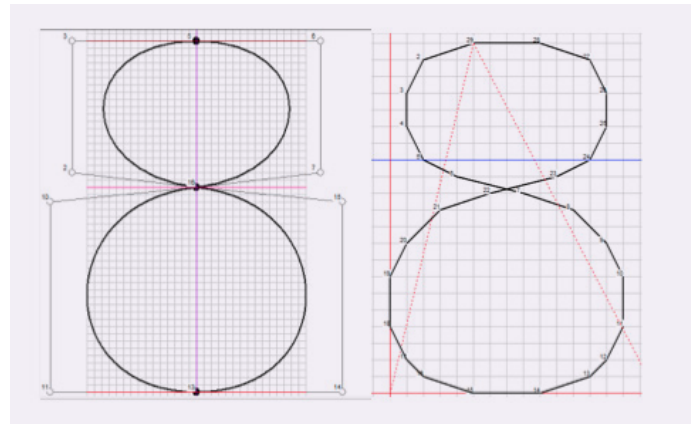
Pic 2. With an application duty up to 80%, the 30 W SmartLase solution can cover the most challenging applications. Thanks to its advanced cooling system, it can even replace less efficient and more cumbersome 50 or 60 W laser coders.

* A duty rate cycle is the percentage of one period in which the laser is active. It is expressed as $D = T/P$ (T is the time the laser is active and P is the total period). See pic 4 also.

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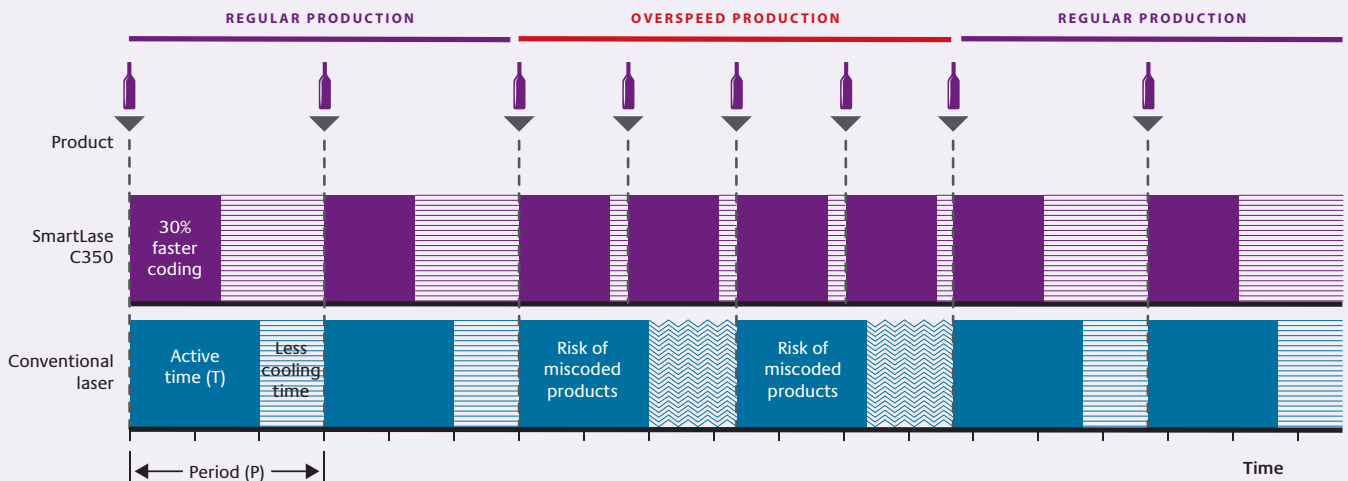
The patented SmartLase Code Technology (SCT) also helps to reduce laser application duty by scribing arcs up to 30% faster than conventional vector lasers (see picture 3).

This means that the marking time and therefore application duty is reduced, which in turn allows the laser to cool for longer, improving the laser source lifetime (see picture 4).



Pic 3. SmartLase Code Technology scribes arcs up to 30% faster than conventional lasers. In this instance, only 4 arcs need to be scribed to produce one figure 8, compared to the 29 vectors used by a conventional laser.

SmartLase Code Technology is capable of operating at high speeds during production peaks, which guarantees all products are coded correctly.



Conventional laser coders cannot operate effectively at higher production line speeds which increases the risk of missing or incomplete codes.

Pic 4. SmartLase Code Technology allows the laser to cool for longer between each product. At a line speed of 85 m/min and 81,000 bottles per hour, the Smartlase C350 only runs at 47% application duty cycle where a conventional laser has to run at 67% for the same throughput.



Proven reliability

Advanced integration with more complex machines on fast packaging lines means that the laser printheads must be capable of operating without fault, regardless of dust or projected liquids and within a wide ambient temperature range.

Ongoing reliability tests have been conducted with a large number of SmartLase coders over a period of more than three years.

Each unit has been subjected to extreme conditions, including temperatures up to 45 °C (the highest risk area), high print cycle rates for up to 23 hours per day, and inrush currents to stress the laser's components. These tests have accumulated over 6 billion prints to confirm a MTBF (Mean Time Between Failure) of 60,000 hours of our laser solution including not only the laser source, but also the printhead and the controller.

Paul Hebert
Manager, Product Reliability and Regulatory Compliance

Improving operational efficiency

To protect the laser from dust and liquid, SmartLase coding solutions are constructed using modular stainless steel units with an IP55 rating as standard (IP65 optional).

Unlike conventional laser coders on the market, SmartLase solutions offer greater protection in wet and dusty environments, improving

operational efficiency and cutting costs.

Maintenance requirements are minimal and all electronic parts are housed within sealed compartments, protecting them from the most rigorous cleaning procedures which might otherwise cause random faults.



To find out more please go to:
www.markem-ijaje.com