



Laser coding on beverage cans

Using laser marking to address coding challenges in beverage production



The beverage industry is a high-speed, high-output sector that requires accuracy, speed and reliability. Production schedules are challenging, therefore maximum uptime and availability is required, as well as the ability to effect fast changeovers.

This white paper discusses the use of laser marking technology to address these challenges.



Contents

Moving from PET to cans for beverages	4
Advantages of using laser coding technology	5
Considerations for achieving a high-quality laser code	6
Bottom Line	7

Both soft drinks and alcoholic drinks are seeing an increase in demand . . .

. . . and innovations in can design and beverage trends such as cocktails, mixed beverages, and sport drinks fuel this increase. In the packaging market, this has led to a shift in requirements away from PET bottling towards new canning lines.

Moving from PET to cans for beverages



There are three main contributing factors for the shift to cans for beverage packaging:

- 1 There is a trend away from PET bottles that had dominated the choice in beverage containers for a number of years and caused growth in cans to be flat (which contributed to limiting the growth in can use). PET is commonly perceived to be more ecologically damaging than aluminum as a packaging material. Aluminum can be fully recycled without loss of quality, helping to reduce waste and loss.
- 2 Customer demand has shifted towards beverage containers that are ecologically-friendly and that reduce the pollution of the oceans with plastics. Consumers have become more conscious about the impact of packaging materials on the environment, and their buying behavior and public opinion have caused a swing in beverage container preference.
- 3 COVID-19 has led to an increased consumption of beverages in private environments, as bars and restaurants had to shut down or limit their capacities in order to contain the pandemic. Consumers buy more cans as they are easy to store and deliver a compact container with a long shelf-life.

All beverage containers need to be coded with a best before date, in addition to information such as lot codes, production site, etc. Historically, beverage cans have been coded with inkjet printers. With the increased trend towards ecologically-friendly processes and materials, beverage manufacturers have been looking for alternative coding options to replace ink-based coding technologies.

Laser coding has evolved over the last 20 years in many consumer packaging applications to be an equivalent or even advantaged coding solution compared to historical marking and coding systems.

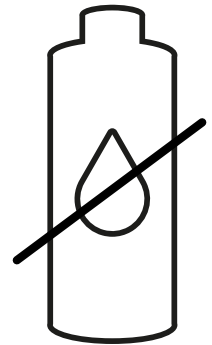


Advantages of using laser coding technology

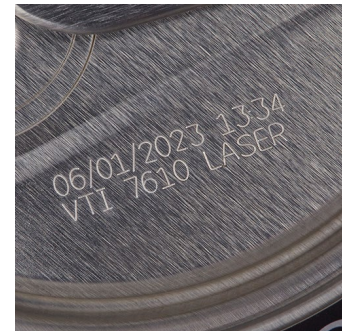
Laser coding has become an advantaged alternative to replace the incumbent inkjet coding on aluminum cans. Instead of printing with ink on the can bottom, the laser engraves the aluminum surface slightly, producing a highly legible, clear code.

The advantages of laser coding are:

- No classical consumables such as inks or solvents. Once installed, the laser will run for years with virtually no maintenance required, apart from occasional cleaning of the laser optics and replacement of exhaust unit filters. The coding process is clean and fast.
- Sustainability is one of the core objectives driving the increase in usage of aluminum cans. Elimination of consumables leads to a reduction in carbon footprint to further boost the sustainability mission.
- Compared to laser coding, classical coding using inks usually requires high degrees of operator intervention to keep running continuously in high demand applications. This can include, but is not limited to, adding consumables to the unit, or additional maintenance activities such as cleaning. Solvent-based consumables also require special storage facilities and management such as stock control due to expiration dates. These costs are eliminated when using lasers for coding.
- A laser generates a permanent and high-quality code on the can that cannot be removed other than by destroying the can surface. Hence, the laser delivers a code that has an inherent counterfeit protection, as the code cannot be altered or removed. This makes a laser code ideal for internal tracking as well as for human readable 'best before' dates and other information.



Considerations for achieving a high-quality laser code



Advantages of using laser marking technology for metal cans

The best laser option to code aluminum cans is a fiber laser marking system. This technology delivers a highly focused laser beam that can engrave the aluminum surface. Fiber lasers have been used across many industries in various packaging and parts marking applications and are fast, clean, and reliable. The fiber laser source has an average lifetime of 50,000 hours, and in many examples up to 100,000 hours. For example, a fiber laser in a 24/7 production environment will deliver approximately 7-10 years of coding operation.

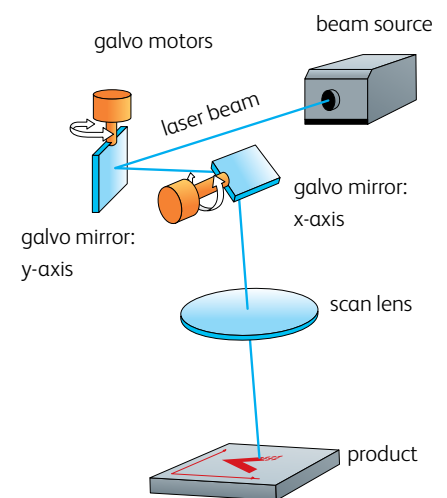
To operate safely, the laser system will need a beam shield to prevent any laser energy from causing harm to operators or adjacent machinery, as well as an exhaust unit that removes and filters out the aluminum (waste) particles that are generated when engraving the can bottom.

Laser marking systems use a set of moving mirrors to mark the code on the product surface. This is a process that takes a few milliseconds, and the more characters that must be coded, the more time it takes. With a two-line code and 22 characters, speeds up to 120,000 cans per hour

can be achieved. The more characters the laser has to mark per can, the lower the throughput will be. Codes containing 3-4 lines of characters and up to 50 characters per can, maximum throughput will be reduced.

Same as with inkjet coders, the can surface should be dry, as droplets of water can absorb the laser energy and cause missing characters. This is similar for inkjet printers, as the droplets would prevent the ink from hitting the can surface, and cause missing or distorted characters. Therefore, a pressurized air blower is often used to dry the cans prior to coding. This is industry standard and in most cases where a laser system replaces an inkjet coder, there is already an air dryer in place.

The contrast of a laser code on the bottom of an aluminum can will be different from an inkjet code, where black or blue ink is typically used for printing. The laser engraves the aluminum surface to produce a high-quality, contrasting mark. Both human and camera readability are excellent. Potentially, an existing vision system may need to be readjusted to read a laser code.





Videojet Technologies Inc. is a leading coding and marking system provider that has been delivering high-quality coding equipment for more than 40 years. Our recently launched Videojet Lightfoot™ Canning Solution (VLCS) provides a turnkey coding system for canning production lines. The Videojet canning solution is IP65 rated, so it can operate in a wet, humid environment. The system can mount directly on a conveyor, and uses two 30-Watt fiber lasers to mark onto cans. It delivers codes with up to three lines at speeds of up to 100,000 cans per hour. The actual code contrast and line speed will depend on the character height and contrast requirements. It comes with all necessary components for a Class 1 laser marking system, including beam shielding and exhaust unit.



Videojet Lightfoot™ Canning Solution

The Bottom Line:

Laser marking is a proven and attractive option to help enhance operational performance while meeting the growing production demands of beverage operations.

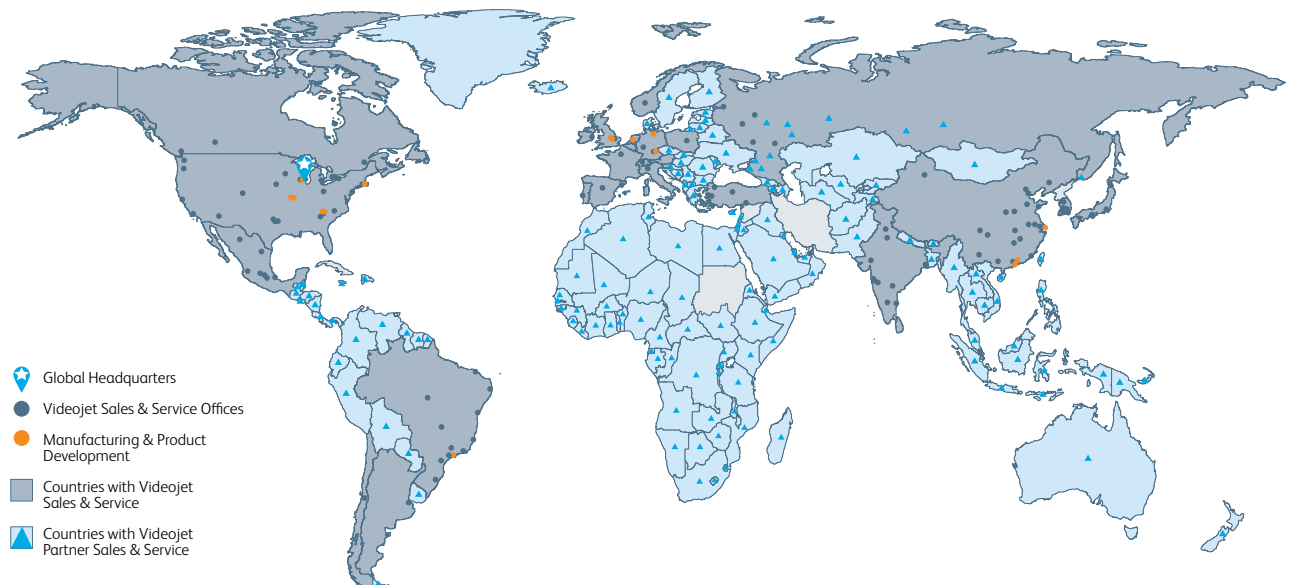
Laser coding has become an advantaged solution for beverage aluminum can marking, replacing classical ink printing solutions with a clean, fast, and reliable coding system that will deliver high-quality codes for many years. Videojet Technologies Inc. provides a turnkey solution that is an exceptionally reliable and easy-to-use laser marking system, delivering superior mark quality.

Peace of mind comes as standard

Videojet Technologies is a world-leader in the product identification market, providing in-line printing, coding, and marking products, application specific fluids, and product life cycle services.

Our goal is to partner with our customers in the consumer packaged goods, pharmaceutical, and industrial goods industries to improve their productivity, to protect and grow their brands, and to stay ahead of industry trends and regulations. With our customer application experts and technology leadership in Continuous Inkjet (CIJ), Thermal Inkjet (TIJ), Laser Marking, Thermal Transfer Overprinting (TTO), case coding and labeling, and wide array printing, Videojet has more than 400,000 printers installed worldwide.

Our customers rely on Videojet products to print on over ten billion products daily. Customer sales, application, service, and training support is provided by direct operations with over 4,000 team members in 26 countries worldwide. In addition, Videojet's distribution network includes more than 400 distributors and OEMs, serving 135 countries.



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