



Application note



Laser Marking Systems

Laser marking on cartons

The challenge

All cartons should have high quality codes, and not all methods of coding can guarantee this. Companies also need solutions that minimize operating costs and keep their lines running. This application note evaluates the pros of and considerations for laser marking on cartons over other coding technologies.

The Videojet advantage

Baked goods and cereal companies look to Videojet to provide application-specific solutions backed by the industry's leading experts in laser marking technology. A Videojet CO₂ laser will ablate (or remove) the ink on the carton to expose the layer underneath, resulting in bright, crisp codes against the colored backdrop of the carton.

- Videojet has robust laser and fume extraction systems ideal for marking on cartons
- Videojet works directly with OEMs for seamless integration into your lines
- With unrivaled application expertise, Videojet helps you make the right coding decision

Code appearance

Pro: Laser marking creates a bright code on the carton. Codes marked with a steered beam (or “scribing”) laser are crisply defined and solidly filled unlike some other coding technologies. Manufacturers of baked goods and cereal products can take advantage of this coding technology to create highly attractive, precise and distinctive production codes, expiration dates, logos and other marks.

Consideration: Contrast and visibility of the code depends on the color of the carton and where on the carton the code is marked. Code contrast can suffer if the ink is removed by the laser, exposing the dull paperboard underneath. For example, a bright code will stand out strongly on blue or black printed cartons but will appear more subtle against light yellow or beige printed cartons. Code contrast can be improved by placing a print window of ink on top of an existing ink layer. By removing just the top ink layer, a bright, legible code can be created. Laser marking in the print window will improve the contrast of the code. Code legibility can be further enhanced with a laser reactive coating that will create a dark mark on a white background.

Durability

Pro: The bright code results from a permanent removal of ink from the carton. The code will be resistant to most abrasions and solvents. Laser marks can typically only be destroyed through physical removal of carton material. Using laser also prevents any issues relating to the time you have to mark the carton or the folding guides smudging your codes as marking is instant and permanent.

Consideration: None.

Coder maintenance

Pro: Laser systems are relatively low in maintenance, with a typical month of production requiring few maintenance interventions, if any.

Consideration: Laser systems are not entirely “maintenance-free.” Fume extraction systems are used to extract the fumes and particulates created when marking the cartons. Filters for the fume extractors must be replaced occasionally. Waste residue from marking should also be wiped away from the laser lens periodically to prevent accumulation.

Purchase and operating cost

Pro: Minimal operating costs for laser marking systems can lead to a lower total cost of ownership over time when compared to alternative coding systems. No inks or solvents must be purchased, held in inventory or changed during production. The relative infrequency of maintenance events reduces labor and downtime costs. Operating cost savings can be particularly significant in high throughput production environments.

Consideration: Laser has a higher acquisition cost when compared to other coding systems but a lower running cost. Filters for the fume extraction system should be changed based upon the demands of the application and the operating environment.

Versatility and flexibility

Pro: Laser marking systems can produce virtually any type of code including brands, logos, text and more. The laser can be instructed to draw virtually any logo or design utilizing a simple interface such as Videojet's SmartGraph™. Marks are fully variable and can be automatically altered based on time, date, units marked or other variable inputs. Laser marking systems can also be easily adjusted to mark on cartons for different products, customers, carton sizes and export to multiple countries.

Consideration: Moving the location of the mark to a completely different location on the carton may require a different method of integrating the laser with the line. One example of this could be moving the mark from the top of the carton to the side of the carton. Additionally, cartons, inks and carton coatings react to laser power and wavelength differently which can affect print quality.

Integration

Pro: Laser marking systems can be integrated inside a cartoner or on the conveyor after the carton has been filled and sealed. Integrating inside a cartoner can require more planning but has considerable benefits. It allows for a more consistent code due to consistent product pitch and distance to the laser. The laser marking system can also use existing guards on the machine. Videojet specializes in integration of its laser marking systems inside cartoners using accessories such as beam turning units and specialized brackets.

Consideration: Integrating on the conveyor instead of inside the cartoner typically requires more accessories such as beam shields. However, integrating on the conveyor can potentially increase the flexibility and versatility of the laser. The location of the mark on the carton and physical position of the laser in the facility can typically be adjusted more easily.



The bottom line

Laser marking on cartons presents unique benefits and tradeoffs that should be considered carefully.

The decision of using laser marking for cartons should be a thoughtful one, and Videojet stands ready to help you think through the best solution for your production line. Videojet's portfolio of lasers is among the broadest and most capable in the industry. With robust CO₂ laser and fume extraction systems optimal for baked goods and cereal production environments, Videojet has the right hardware. And with a dedicated team of laser physicists, engineers, technicians and knowledgeable sales engineers, Videojet has the expertise.

Ask your local representative for guidance on laser marking, a production line audit or sample testing in Videojet's specialized samples laboratories.

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