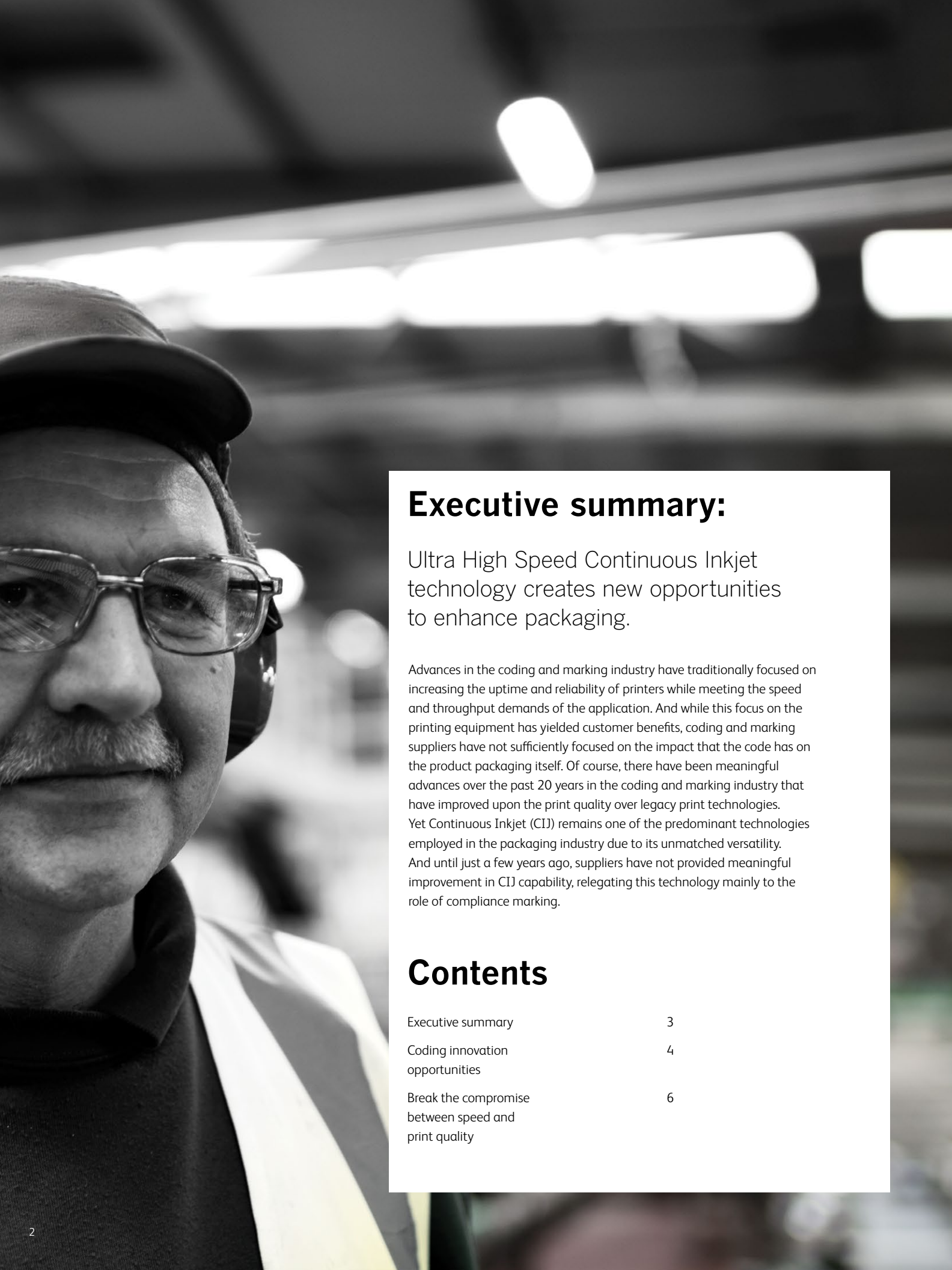


From compliance marking to value-added coding

Ultra High Speed Continuous Inkjet technology creates new opportunities to enhance packaging



Innovation in the coding and marking industry has historically been focused on printer reliability while matching the speed and throughput requirements of today's packaging lines. And while these remain core requirements, advances in continuous inkjet technology enable new possibilities for coding and marking to make positive contributions to packaging appearance, layout, and content.



Executive summary:

Ultra High Speed Continuous Inkjet technology creates new opportunities to enhance packaging.

Advances in the coding and marking industry have traditionally focused on increasing the uptime and reliability of printers while meeting the speed and throughput demands of the application. And while this focus on the printing equipment has yielded customer benefits, coding and marking suppliers have not sufficiently focused on the impact that the code has on the product packaging itself. Of course, there have been meaningful advances over the past 20 years in the coding and marking industry that have improved upon the print quality over legacy print technologies. Yet Continuous Inkjet (CIJ) remains one of the predominant technologies employed in the packaging industry due to its unmatched versatility. And until just a few years ago, suppliers have not provided meaningful improvement in CIJ capability, relegating this technology mainly to the role of compliance marking.

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Interestingly enough, the continued evolution of faster CIJ technology has now opened the door to value-added coding possibilities. Matching line speed will always be a prerequisite – a printer must meet the application requirements.

But the development of faster CIJ technology now means that packaging professionals can explore code variations that may enhance their packaging appearance, layout, and content. Simply put, these advances mean packaging professionals can print more content, faster.

This paper explains how Ultra High Speed CIJ technology has advanced to the point where value-added coding is now a real option for many packaging operations.

In the recent past, CIJ technology required packaging professionals to make trade-offs between line speed, code content, and print quality. This was, historically, a limitation of the technology itself. CIJ operates by jetting individual drops of ink and modifying their flight path to 'draw' a character one drop at a time (see CIJ schematic). While this technology works exceptionally well for single line codes, line speeds and print quality have historically suffered whenever multiple lines of code were required. Given these performance constraints, CIJ technology is used most frequently for compliance marking of single and double line codes – frequently expiry date, lot, and other related data.

Enabling a transition to value-added coding

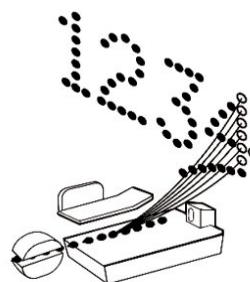
Packaging professionals have continued to push coding and marking suppliers to develop faster print technologies for applications at the extremes of line speed and throughput. High speed beverage and canning operations, along with certain applications in dairy, pharmaceutical, and industrial markets, necessitated four main improvements to Ultra High Speed CIJ technology:

- 1) Higher resolution, higher frequency printheads so the printers can jet sufficient ink drops to keep pace with the production environment.
- 2) High speed inks designed for optimal drop formation.
- 3) Sophisticated software algorithms to deliver better print quality.
- 4) High speed, variable data communications to enable a unique code to be printed on each package.

In total, these improvements mean that today's leading Continuous Inkjet printers can now print more variable content at higher speeds and higher print quality. While the underlying technology is interesting, the possibilities for value-added coding are far more intriguing. Today's Ultra High Speed CIJ printers are now fast enough to enable packaging professionals to add a third line of content in applications historically limited to two lines, or emphasize certain elements of the code with a bold, or 'double-stroke' font. Of course, the authors of this white paper have no false beliefs that a third line of code by itself sells more product. But what is the value of...

- Dedicating more packaging space to branding and product graphics instead of compliance marking?
- Adding promotional codes to product packaging to drive incremental growth?
- Adding crisper, more legible codes to reinforce a brand's quality promise to observant customers?

Competition in the grocery aisles and store shelves has never been more intense. In the end, small changes in share position are meaningful revenue and profit opportunities.



CIJ schematic

Coding innovation opportunities



In branding and promotion, marketing needs the whole package to help sell

Within the operating range of a given print technology, variable coding provides packaging professionals with a great deal of latitude for code content. Ultra High Speed technology opens further possibilities to applications that use Continuous Inkjet technology. The figures to the right show valued-added CIJ coding possibilities deployed by leading packaging operations. These figures demonstrate a few common themes relative to an illustrative, current code – **Figure 1**.

Figure 2:
Return space to the marketing team

Ultra High Speed CIJ printers have the ability to actually print denser codes. Coupled with higher resolution printheads, today's leading CIJ printers can now print at higher character pitch (more characters per inch) without sacrificing code legibility. The net result – print the same content in less space, at the same line speed.

Allow your marketing teams to repurpose the freed-up space to drive more growth for your brands.

Figure 3:
Add a third line of code

Across most industries, the evolving trend for more traceability data has been never-ending. In the past, those demands have forced packaging engineers to compromise between code content, line speed, and print quality. With the enhanced capabilities of today's leading CIJ printers, engineers can break the compromise between speed and content by adding three lines of code in applications historically limited to two lines.

Meet traceability demands without slowing down your lines.

Figure 4:
Add promotional codes to your packaging

Just like adding a third line of code, the historical choice of adding promotional data typically required slowing down the packaging line. This put an added premium on the anticipated lift from the promotional activity to make up for the diminished line productivity.

Now, marketing teams and packaging teams can more easily include gaming and promotional data on the packaging, freed from the speed limitations and penalties of the past. **Shift the discussion from coding limitations to growing the brand.**

Figure 5:
Enhance the legibility of your codes

Faster speed can be utilized in a number of intriguing ways. By adding faster CIJ printers to their lines, packaging professionals can print bold fonts to help the legibility of the code. Alternatively, additional content can be added to aid the consumers' understanding of the compliance marking – all printed in the same space and at the same speed as the current code. These possibilities, while subtle, help communicate a message of quality and customer care. **Reinforce the brand's quality promise to observant customers.**

Figure 1: Current code



Figure 2: Print the same content in less space



Figure 3: Add a third line of traceability data

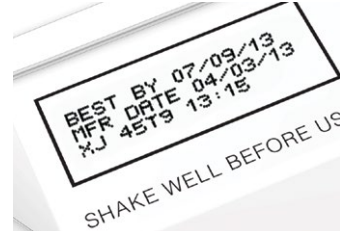


Figure 4: Print promotional material and gaming codes



Figure 5: Enhance legibility through BOLD font or increased content



Note: All codes printed at 95 meters per minute

Break the compromise between speed and print quality

The advancements in Ultra High Speed CIJ technology now enable packaging professionals to move beyond basic compliance marking.



But the observant reader will point out that only a minority of CIJ applications have transitioned from traditional compliance marking to value-added coding. This raises the obvious question: why? Packaging professionals have been appropriately conservative about pushing the boundaries on their printing and coding equipment, unwilling to accept the historical compromise between speed and print quality. Using packaging for brand communication has long been a primary means of product differentiation. Historically, CIJ simply could not print with sufficient legibility to produce the value-added codes as depicted in the prior examples. After all, packaging is no longer about aesthetics alone – it is about information provision, communication, and ultimately enabling consumers to make informed decisions about what they buy and how and when they use products.

At Videojet, we have broken the speed-quality compromise by employing a system-based approach to printer design and development. Our Ultra High Speed printers surpass current technology through the use of the Videojet innovative Precision Ink Drop™ system. Precision Ink Drop™ is a combination of unique ink chemistry, advanced printhead technology and sophisticated software algorithms that modify the flight path of individual ink drops for optimal code quality.



2 line application



3 line application

**The end result?
Packaging professionals
can now print more
content, faster, and bring
greater value-added
coding possibilities to
their operations.**

Running faster helps you run smaller

The trend toward smaller packaging form factors are apparent to even the casual observer. Compared to bulk packaging, single-use packaging addresses a number of consumer needs including convenience, portion control, and enhanced shelf life. But single-use packaging often requires the same compliance and traceability marks as bulk packaging – resulting in a higher percentage of the packaging being reserved for coding. Ultra High Speed helps here too. With the ability to print the same content in a smaller space at the same line speed, Ultra High Speed CIJ frees up more packaging space for branding and messaging to the consumer.

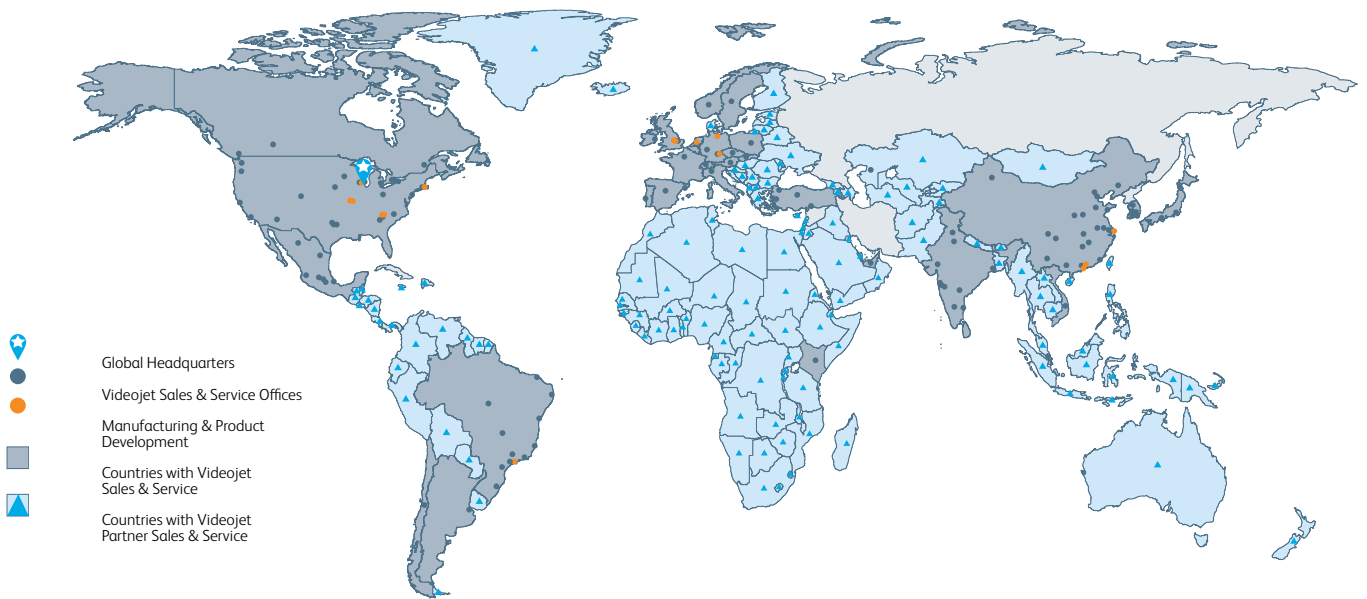


Peace of mind comes as standard

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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