



Application Note



Pharmaceuticals Fiber laser coding on vial caps

In times of a fight against a global pandemic like COVID-19, vaccines are an important means to win. Therefore, not only does critical serialised data need to be printed onto the unit carton, but also traceability information is put onto the vials and syringes.

Marking internal traceability information on vial caps is inherently challenging due to their small size and curved shape. The codes need to be legible and accurate, even after vials are subjected to a sterilization process or passed through cold-chain-distribution. Due to the small space in vial handling systems such as a star wheel, integrating a marking solution while still having the power and precision to mark small DataMatrix or alphanumeric codes at high speeds is challenging.



Engraving of a 2D DataMatrix code



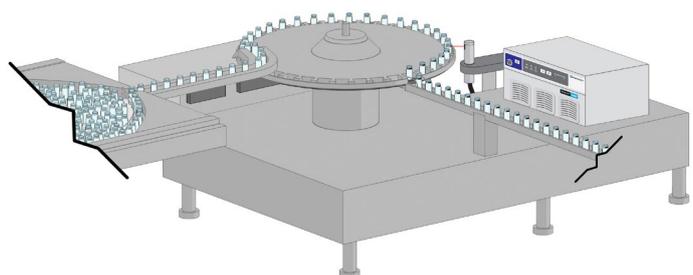
Ablation of alphanumeric text

Coding requirements

Vials remain a leading packaging solution for liquid dosage forms, especially for vaccines, where the packaging aids safe and sterile dispensing. To help ensure safety throughout the distribution chain, code quality and accuracy is critical. Vials can be marked with GS1-DataMatrix or alphanumeric codes on the closure or top of the vial cap, as well as on the bottom. Invisible codes, printed with UV ink, allow for internal traceability without the code being visible at the point of use. Marking vials with ink-based technologies might be challenging in the case of vaccines, because they must be stored in a temperature-controlled environment to avoid decrease in potency and effectiveness from the time they are manufactured until they get administered. During the manufacturing, packaging, and distribution in a cold chain environment, codes may not adhere throughout without smudging.

Fiber laser marking systems are designed to face this challenge and meet the needs of pharmaceutical manufacturers. These systems can mark permanent codes and other information on robust, high-density materials or curved surfaces, such as aluminium vial closures and caps. Fiber lasers can mark the vials either by engraving or by ablation, if the caps are coloured. In case of engraving, material is taken out or removed from the surface, whereas in case of ablation, the existing colour and surface layers of anodized aluminium are partially removed and the base material becomes visible.

Vials caps are mainly marked when in a star wheel, an efficient transport system for the instable vial containers to guide them safely, reduce the risk of glass breakage, and separate them on their way throughout the filling and capping station. There is usually little space in star wheels, which is challenging for the integration of a typical laser.





Videojet laser marking solution for vial caps

The Videojet 7340 (20-Watt) and 7440 (30-Watt) are versatile fiber laser marking systems that feature the Lightfoot™ marking head, the smallest fiber laser marking head on the market, designed for simple integration, reduced installation costs, and increased range of installation opportunities. It is an ideal solution for pharmaceutical manufacturers who have space limitations, are looking for simple integrations, or do frequent rapid changeovers while still printing high-quality, permanent codes at high production speeds.

The Videojet fiber laser marking systems featuring the Lightfoot™ marking head allow:

Simple integration

With its compact size of 205mm / 8.07 inches in height and 41.3mm / 1.60 inches in diameter and weight of less than 1kg / 2.2 lbs, the smallest and lightest fiber laser head on the market achieves easy integration and greater versatility in tight spaces, like in star wheels for vial handling.

The 0° or 90° marking heads (see picture on the right) make it even easier to integrate Lightfoot™ and allow coding on vial caps from different sides, no matter if the vials pass the laser laying down or standing up.

Configurability

Whether the production line design allows the marking head and supply unit to be close to each other or requires further distance, two umbilical length options (3m / 118.11 inches or 10m / 393.70 inches) are available to ease integration and deliver flexibility in positioning the laser.

Productivity

The Lightfoot™ fiber laser marking head reaches competitive marking speeds of up to 2,000 characters per second.

Permanent, traceable and legible codes

By marking aluminium vial closures on the side, the laser creates durable codes that last the lifetime of the product to help maintain internal traceability at any time.

IP69

Due to a water and dust tight IP69 laser marking head that is protected against close-range high-pressure, high-temperature washdowns, there is less need for additional housing or equipment.

Focusing

The Lightfoot™ marking head features an integrated pilot beam focus finder. The pilot beam offers easier, faster, and more precise focal alignment during the installation process or when needing changeovers. There is no need for measurement tools or adjustments, as operators can easily see the pilot beam is in focus and the laser is ready to code with the highest quality, thanks to the built-in system using triangulation of two beams.

Ease of operation

The Videojet range of laser controllers allows two different types to operate a laser, helping to ensure seamless operation in production lines. A Videojet laser controller can be operated autonomously or integrated in a packaging machine, where it is controlled by the HMI (human machine interface).



Safety Consideration

Laser marking technology requires two additional considerations for proper and safe installation: beam enclosures and fume extraction. Fume extraction is an important element of any laser marking installation, helping to remove the smoke and particulate debris generated during the marking process. Videojet offers a range of fume extraction systems and beam enclosures that can be custom tailored to meet your production line needs. If desired, Videojet can help manufactures to set up safety systems to obtain a Class 1 laser certification.

90°

0°

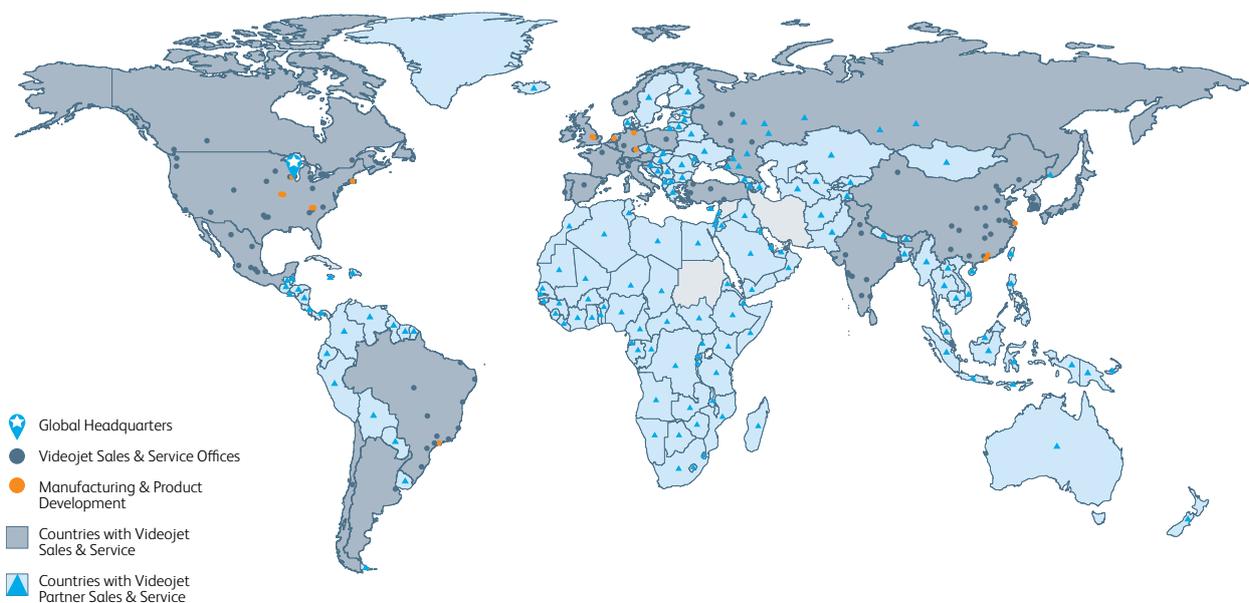
Size
205.0mm / 8.07 inches

Peace of mind comes as standard

Videojet Technologies is a world leader in industrial coding and marking solutions with a dedicated global healthcare team supporting organisations and supply chain partners with solutions, certifications and fast, reliable service.

A product portfolio including thermal inkjet, laser marking, continuous inkjet and labelling provides consistent, high-quality serialisation and traceability codes, helping the pharmaceutical and medical device industries safeguard their products against counterfeiting and protect consumer safety. With a wide range of technologies addressing virtually any application, Videojet is the expert in realizing the specific requirements of a wide range of healthcare applications.

With decades of knowledge, Videojet Technologies' expertise in industry standards and global regulations makes them the right partner for understanding complex coding needs. Videojet solutions code 10 billion products a day worldwide, playing a vital and responsible role in the world. With over 4,000 associates serving 135 countries, Videojet has the capability to provide local service through global resources.



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