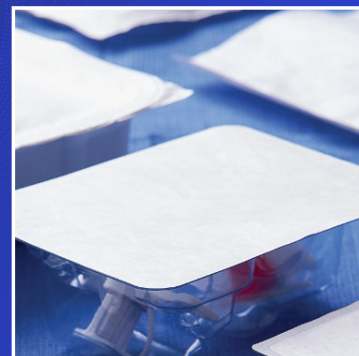


Applying variable data directly onto DuPont™ Tyvek®



Challenges

Due to the induction of the Unique Device Identification (UDI) system, medical devices can now be identified throughout the supply chain, from manufacturing to patient use.

In order to comply with the UDI standards, medical devices must be labeled with both product and production-specific data. This information is usually printed on the packaging of the device in human and machine readable forms using a GS1 DataMatrix code or GS1 128.

For sterile packaging, DuPont™ Tyvek® is a trusted choice for all medical devices because of its tear resistance, durability, breathability and superior microbial barrier properties.

To ensure high-quality UDI codes on DuPont™ Tyvek® and other substrates, adapted printing equipment and consumables need to be chosen. This Application Note gives an overview of the different Tyvek® styles used in medical packaging and the corresponding Videojet coding technologies, inks and ribbons.

Our advantage

Videojet offers three coding technologies that can be considered for direct printing on the medical packaging styles of Tyvek®.



Thermal Transfer Overprinter (TTO)



Thermal Inkjet (TIJ)



UV Laser Marking

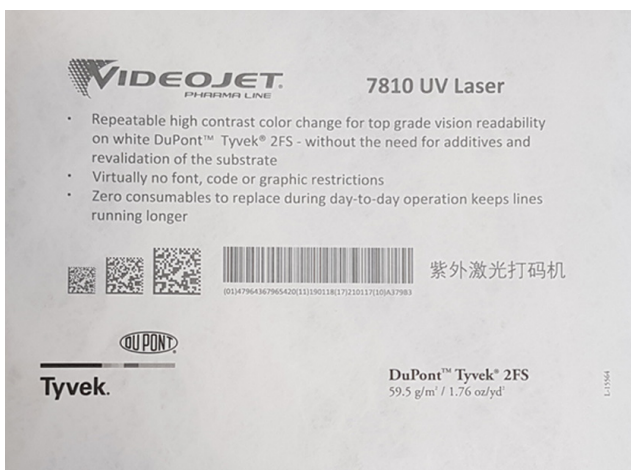
In order to help ensure coding quality, the Videojet sample laboratory has conducted extensive tests to determine the best application equipment for the various Tyvek® styles.

Testing approach

GS1 DataMatrix ECC 200 codes were printed on DuPont™ Tyvek® sheet samples using different coding technologies, inks, or ribbons. Once the testing determined the most promising combinations, a set of 10 codes were printed and graded with a barcode verifier in accordance with ISO/IEC 15415.

ISO/IEC 15415 recommends verifying the code in its final configuration wherever possible (e.g. package containing the product). In this study, printed Tyvek® sheet samples were used without final configuration. For verifying codes printed on Tyvek® 40L, which has a linen-like appearance, a white cover was used to support the sheet from the backside of the sample which resulted in good grading quality.

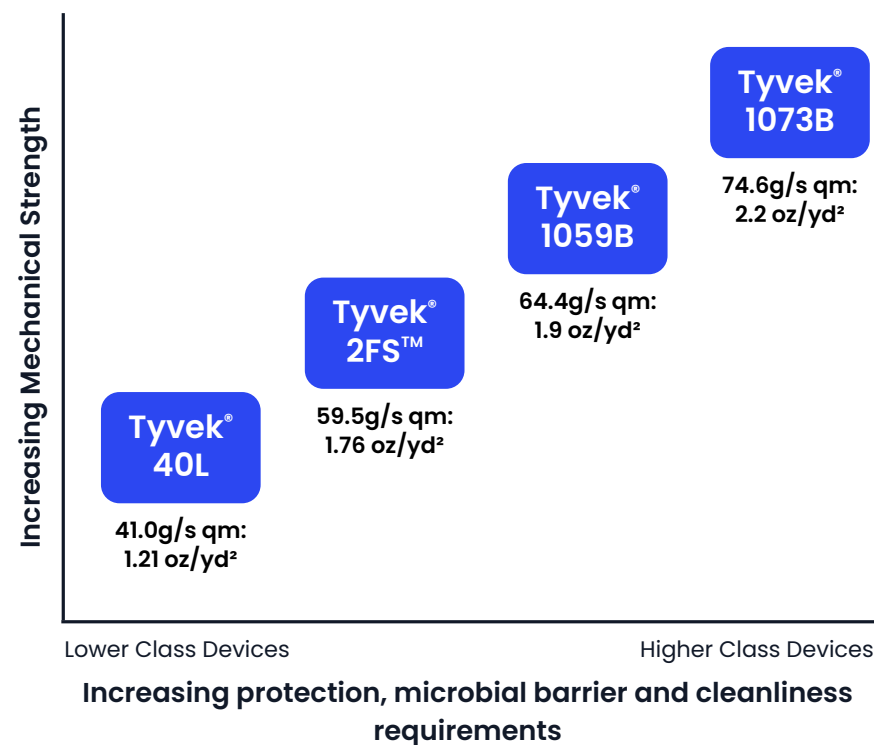
The coding technologies and consumables presented in this application note have consistently achieved a grading of 2.5 (B) or better in these tests under laboratory conditions.



Four unique styles for Tyvek® medical packaging needs

Tyvek® is a porous packaging material made of very fine and continuous filaments of virgin high-density polyethylene (HDPE). The unique structure of Tyvek® creates a tortuous path with substantial lateral movement, making it harder for bacterial spores and other contaminating microbes to get through. This tough filament web makes Tyvek® also highly durable yet breathable reducing the risk of package failure. Tyvek® packaging material is a trusted choice for all medical devices ranging from catheters to implantable devices.

Four Tyvek® styles are available for the market to serve unique packaging needs in medical industry. These Tyvek® styles cover all medical packaging performance requirements. If you have questions or need information regarding Tyvek®, contact your local DuPont™ representative or visit: medicalpackaging.dupont.com.



Printing application	Thermal Inkjet (TIJ)	Thermal Transfer Overprinter (TTO)	UV Laser Marking System
Tyvek® 1073B	✓	✓	
Tyvek® 1059B	✓	✓	
Tyvek® 2FS™	✓	✓	✓
Tyvek® 40L	✓	✓	

Videojet coding solutions for Tyvek®



Thermal Inkjet (TIJ)

A non-contact printing technology that enables high-speed, high-resolution printing on flat and slightly uneven surfaces. Ink drops are propelled out of the cartridge's multiple nozzles by air bubbles formed by thermal initiation. For printing onto Tyvek®, Videojet recommends using Wolke Global Solvent Ink. It is manufactured in-house by industry-leading ink experts and offers proven performance that rivals other solvent inks.

We recommend: Global Solvent Ink

- ✓ Average dry time <3 seconds on non-porous materials with 2D codes
- ✓ Best-in-class decap (cap open) time while in printing pocket helps ensure worry-free production

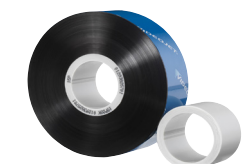


Thermal Transfer Overprinter (TTO)

A digitally controlled printhead precisely melts ink from a ribbon directly onto flexible substrates such as Tyvek® to provide high resolution, real-time prints. For printing onto Tyvek®, Videojet recommends using the Videojet Rough Texture black ribbon. It is coated with a blend of wax and resin and features excellent adhesion and contrast when printing on rough, uneven surfaces.

We recommend: Rough Texture black ribbon

- ✓ Very good print quality at high speeds; sharp bar codes at 90°
- ✓ Very good resistance to smudging and abrasion
- ✓ Excellent light resistance



UV Laser Marking System

A beam of infrared light focused and steered with a series of carefully controlled small mirrors to generate permanent, high-contrast marks on Tyvek® 2FS™. The UV wavelength creates a color change on Tyvek® 2FS™ through a chemical reaction without damaging the material. This eliminates the need for additives and substrate revalidation.

Our Vision: Preserving the safety, quality, and authenticity of daily essentials for billions

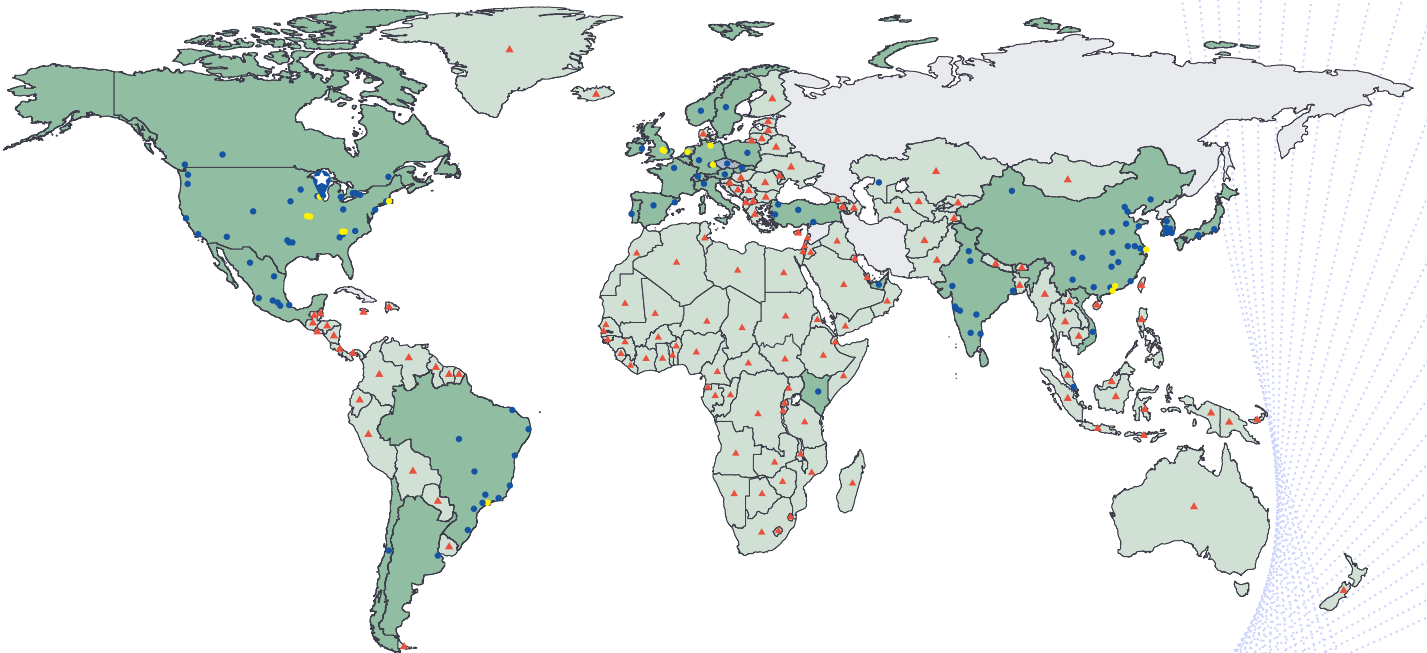
At Videojet Technologies, we believe that every product tells a story—a story of quality, care, and trust. As a global leader in product identification, we proudly partner with manufacturers in over 20 industries, from food, beverage, cosmetics, and personal care to pharmaceuticals, tobacco, packaging, aerospace, and beyond, helping them to identify products, enhance operations, and improve productivity. We work tirelessly with customers, OEMs, and channel partners, to protect the safety and integrity of daily essentials relied on by billions of people every day.

The Videojet core pillars of **expertise, adaptability, usability, and consistency** are values that drive us forward, inspiring us to deliver high-performance, reliable solutions that meet the unique needs of every manufacturer we support. With an unwavering commitment to excellence, we offer a comprehensive suite of **marking and coding equipment, high-quality supplies, dedicated Videojet-trained on-site service technicians, and advanced software solutions** to bring peace of mind and pride to our customers.

Our technology portfolio spans **Continuous Inkjet (CIJ), Thermal Inkjet (TIJ), Laser Marking Systems, Large Character Marking (LCM), Thermal Transfer Overprinting (TTO), Print and Apply Labeling (LPA), Pallet Labeling, and wide-array printing solutions**—all crafted to deliver adaptability, precision, and cutting-edge innovation that makes a difference.

With over 400,000 printers marking ten billion products daily, our solutions touch lives across the globe. Supported by a team of 4,000 associates in 26 countries and a network of 400 distributors and channel partners in 135 countries, we bring expert service and heartfelt dedication wherever companies operate.

As part of Veralto—a global leader in essential technology solutions dedicated to “**Safeguarding the World’s Most Vital Resources™**”—we are not just building systems but shaping a future where every brand can deliver trusted products with confidence, enriching lives and fostering connections with consumers worldwide.



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