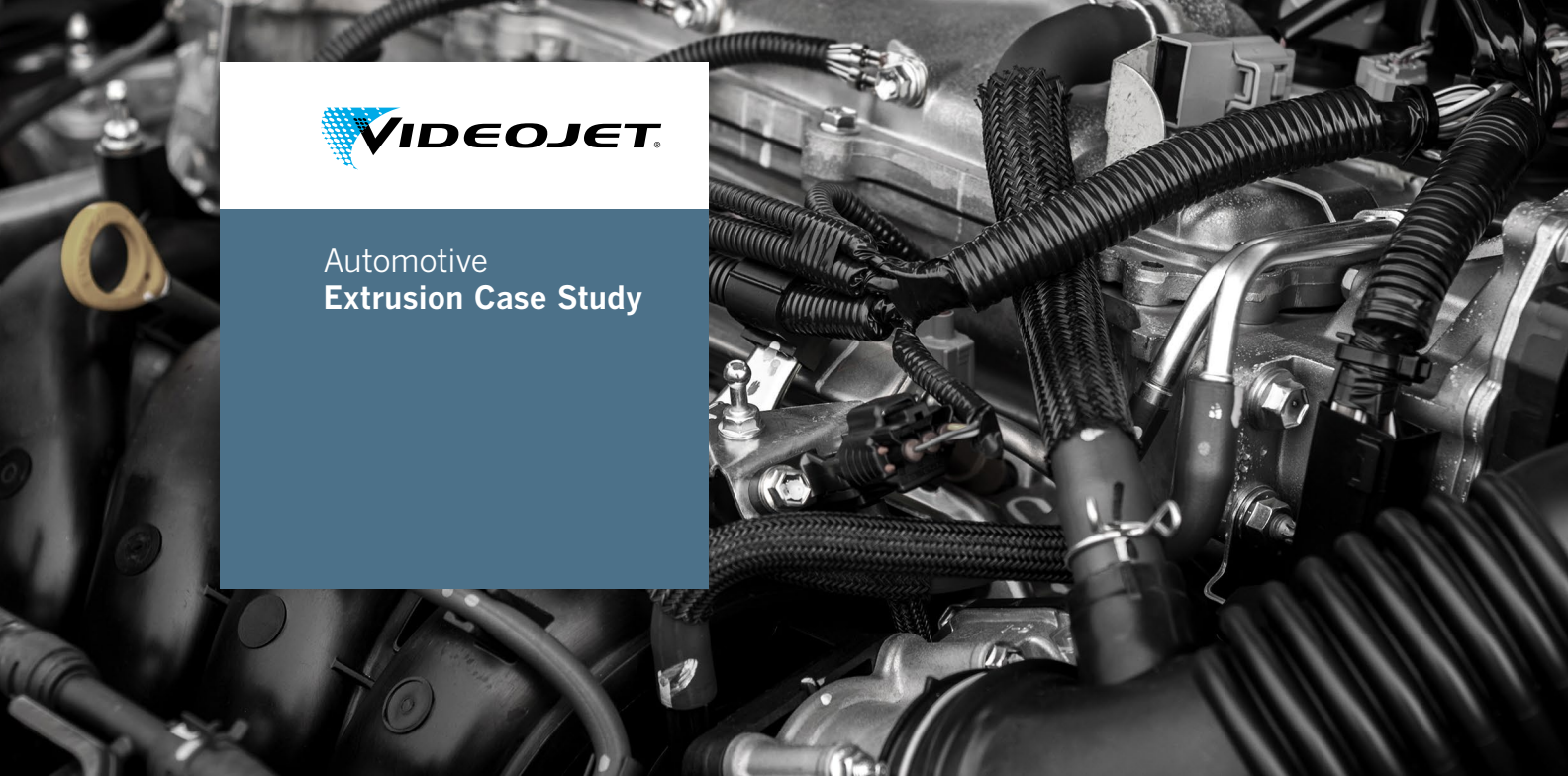


Automotive
Extrusion Case Study

Videojet coding solutions keep up with automotive supplier's fast-paced production

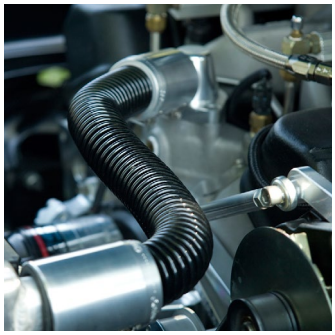
For a global producer and supplier of automotive fluid storage, carrying and delivery systems, efficient production processes are critical for the company's success. The company has 23,000 employees at 130 locations in 28 countries, and supplies all of the world's major automobile manufacturers.

Flexible tube products for fuel/brake delivery systems are produced at one of the company's plants in Germany. The plant runs on a three-shift, 24/7 production, 360 days per year schedule, producing two main types of tubing: corrugated and non-corrugated. Corrugated tubes are used in automotive production processes where flexibility is needed, for example, in braking systems near the wheels, as wheels are regularly dismounted. The chemical composition of the tubing can change based on the customer's specification and which system the tubing is specified to be used for.

“You just turn the switch on and it just works, every time.”

Operator
Automotive fluid storage, carrying and delivery manufacturer

Tubing produced by the plant is either black, blue or white in color. The non-corrugated production lines were operating at 90 meters/minute, with the ability to move up to 120 meters/minute. The corrugated lines were operating at 20 meters/minute.



The Challenge

For the white tubing, the plant used continuous inkjet (CIJ) printers, as they offered the necessary contrast. For the black and blue tubing, the company decided to look at laser marking systems to create a white code, again offering good contrast.

Extrusion lines are typically expensive to shut down, due to the use of high performance plastics in the extrusion process. These plastics cannot be recycled and upon start-up, approximately 40kg of plastic has to be scrapped just to get this plant’s line running. 1kg of high performance plastic costs about 35 EUR, so this producer wasted approximately $1,400 EUR every time a line had to start up again.

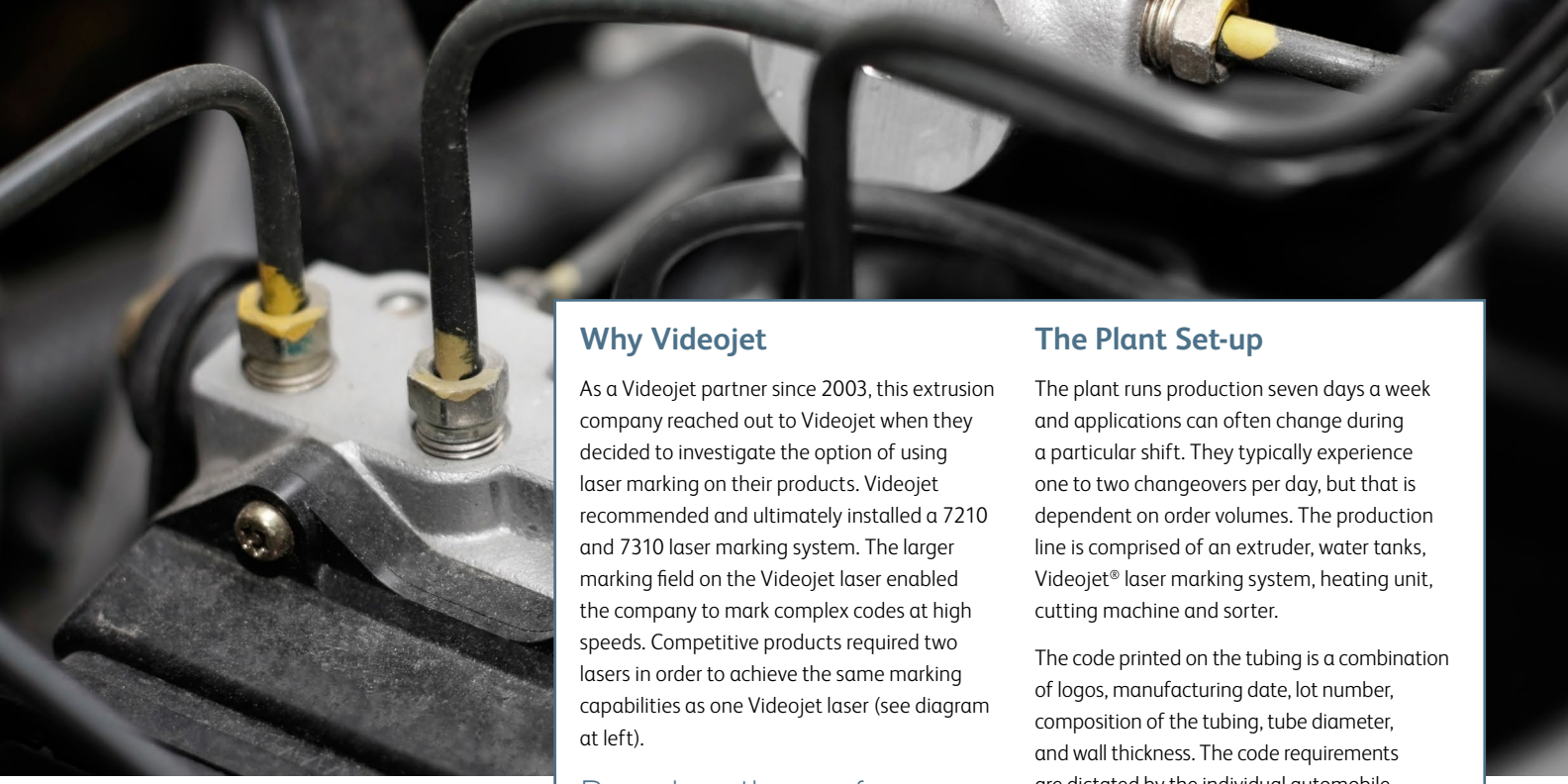
This extrusion producer was previously using inkjet printers to code on the tubing. These printers delivered the necessary codes, but required a lot of maintenance and were prone to downtime. The line had to be stopped to clean the printhead multiple times a day and address printer faults.

Printer failures during night shifts had even more of an adverse impact, because the expertise to fix issues was not available during this time. The plant estimated that they were spending about two hours per week, per printer on maintenance and resolving other downtime-casing issues.

Uptime is extremely important to extrusion producers as customers often demand as little as a three-day turnaround time. Their customers do not keep inventory on the tubing products, so the extrusion producer has to ensure that their production line is operational.

For this producer, every component on the extrusion line has to run correctly, otherwise the plant can produce scrap products at a rate of ~80m/min. Given the cost of high performance plastic, that equates to approximately 200 EUR/min. As an example, if the printer goes down and no one notices for five minutes, 1,000 EUR worth of high performance plastic would need to be scrapped.

Another issue was code contrast and permanence. The pigmented inks for printing on the black and blue extruded products were not offering enough contrast to pass Quality Assurance review. In general, the end customers also didn’t like the ink-based codes because they did not provide the required permanence. Code permanence is particularly important in applications for fuel systems, where fuel and its fumes can wash away ink-based codes.



Why Videojet

As a Videojet partner since 2003, this extrusion company reached out to Videojet when they decided to investigate the option of using laser marking on their products. Videojet recommended and ultimately installed a 7210 and 7310 laser marking system. The larger marking field on the Videojet laser enabled the company to mark complex codes at high speeds. Competitive products required two lasers in order to achieve the same marking capabilities as one Videojet laser (see diagram at left).

Based on the performance of the laser systems and Videojet's depth of knowledge of online marking, the company was convinced they'd find the solution they needed.

Once the Videojet laser marking systems were properly configured and set-up, they were able to perform exceptionally well on the fast extrusion lines. They also delivered clear, readable, permanent codes, which was critical to this extrusion producer. In addition, the laser coders offered lower maintenance requirements than their former inkjet printers had done.

The extrusion producer reports that taking into consideration ink consumables, labor and lost productivity, they were able to realize a 9-month ROI period by switching to laser marking systems.

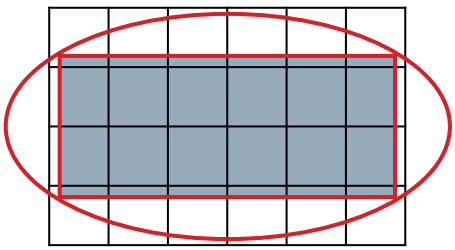
The Plant Set-up

The plant runs production seven days a week and applications can often change during a particular shift. They typically experience one to two changeovers per day, but that is dependent on order volumes. The production line is comprised of an extruder, water tanks, Videojet® laser marking system, heating unit, cutting machine and sorter.

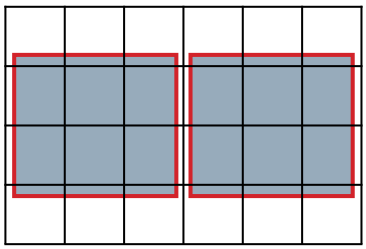
The code printed on the tubing is a combination of logos, manufacturing date, lot number, composition of the tubing, tube diameter, and wall thickness. The code requirements are dictated by the individual automobile manufacturers, and can require real-time changes, based on how the line is set up. The company also has a need for permanent codes, to aid in traceability.

The production process includes a number of different equipment types including printers, flaw detection, dimension control, flaming, cutting and transfer equipment. The printer is networked and integrated into the production line. A 3P software communicates from the company's database to the laser marking system, telling the laser which code to apply. The production line can also update code elements in real-time.

The extruded tube is tested as it is produced, and any deviation from specifications is noted and communicated to the laser marking system. The laser will code whatever thickness/diameter is measured and a process down the line will push any defected tubes into a reject bin. Defective tubes are still marked, just in case some make it through the automated check system. The laser code allows for a subsequent visual check that can also catch defective tubes.



Marking field with one Videojet® laser coder



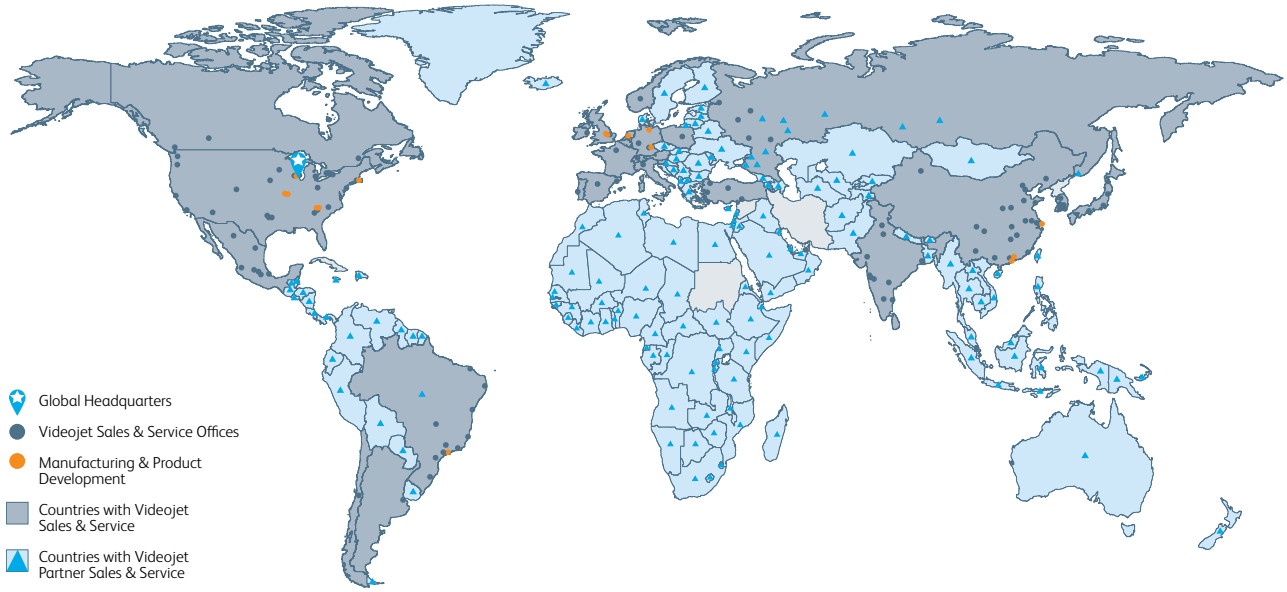
Marking field with two competitive laser coders

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 345,000 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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