Vadain automates the inspection of curtain fabrics with machine vision

Curtains. Everyone has them at home. But have you ever wondered how they are made? And what does it take to deliver tailor-made curtains error-free to the end user?

Vadain, the market leader in custom curtains in the Netherlands, needed a solution to detect errors as early as possible in kilometers of curtain fabrics. Together with software developers from Sycade, OMRON machine vision technology, and machine builder Eisenkolb, they developed an automated solution to detect and analyze errors in curtain fabrics, making the time-consuming manual inspection process a thing of the past.

The challenge: Flawless curtains

Delivering flawless curtains is a top priority for Vadain. In addition to the right dimensions, correct production method and finishing, identifying and preventing fabric defects before they enter production is a crucial step.

If any flaws are detected once the curtains are hung at the customer's premises, they are very costly to remedy, including replacing the product, as well as all associated logistics processes and work hours.

Production defects

As a rule of thumb, Vadain estimates that an average roll of fabric may contain a maximum of 5 defects, such as weaving errors or stains. In the best case, a fabric supplier has already marked the flaws in the roll. However, the responsibility for detecting and processing the defects is passed on to Vadain.

Quality checks

To prevent any defects, several checks are made between the receipt of goods and dispatching the finished product. The first check takes place when the material arrives and is stored in the warehouse. More checks are carried out prior
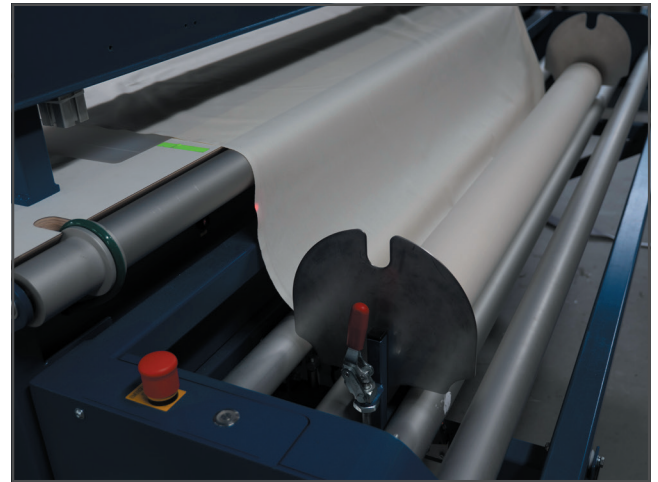
to production and at the workshop before production, as well as a final quality check of the finished product before shipment. The inspection was done manually, by unrolling and rolling the fabric over light boxes.

While rolling, an employee visually checks for errors in the fabric. With thousands of different types and tens of kilometers of fabric in stock, this is a very time-consuming and inefficient procedure. Also, an employee can only carry out these checks for a short time with full attention. As soon as the inspection is done and the fabric goes to production, the fabric is then cut to size on light boxes. Once again, the seamstress or cutter carries out a quality check. With their trained eyes, they rarely miss an error.

Solution with machine vision
The team at Vadain thought that there must be a better, more efficient and faster way to inspect the fabrics, and presented the challenge to Sycade, an expert in the field of quality improvement through automation in the manufacturing industry. Sycade proposed a concept to automate the inspection process with a machine vision solution. The solution performs checks faster and more accurately, reduces complaints and cutting loss* and ultimately results in cost savings. With the expertise of Vadain, the technology and innovative automation concept of OMRON, hardware of Eisenkolb and (camera light supplier), Sycade set up a solution using a ,standard' rolling machine to unroll rolls from position A and roll up again to position B. The unrolled fabric passes over an assessment surface with an integrated cutting unit, located inside a dark unit with vision technology.

Cutting loss*
Cutting loss occurs when rolls are cut for production. Residual pieces are regarded as cutting loss, and largely disposed of as waste. By accurately documenting fabric lengths on partial rolls-and matching these with the requirements for each order-cutting loss, waste and the associated costs can be minimized.

Intelligent software
The lighting and camera inspection system can detect even the smallest deviations in substances, thanks to intelligent custom software from Sycade and ,customized' standard hardware from OMRON. However, it is not enough to simply find a fault in a roll of fabric. Fabrics are not all equally thick or transparent, and they come with different weave structures, colors and reflection. The correct light and camera adjustments and programming settings were discovered after a series of tests.

Detect, cut, register
What needs to be done when a defect is detected and assessed? In the case of dust, it can be removed by the operator and the machine receives a signal that it can pass. In the event of a stain or weaving error, the machine has already identified the location of the defect. The machine has also already measured how much fabric has been unrolled up to the defect. After cutting from the correct location, this partial roll is marked with a sticker with the parent roll plus partial roll marking, including the number of meters. This makes it possible to have an overview of how many meters of flawless fabric is in stock and in which cuts. This ensures that the workshop knows exactly which
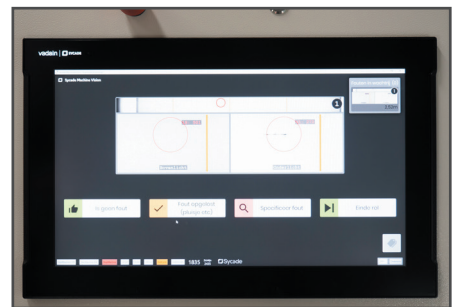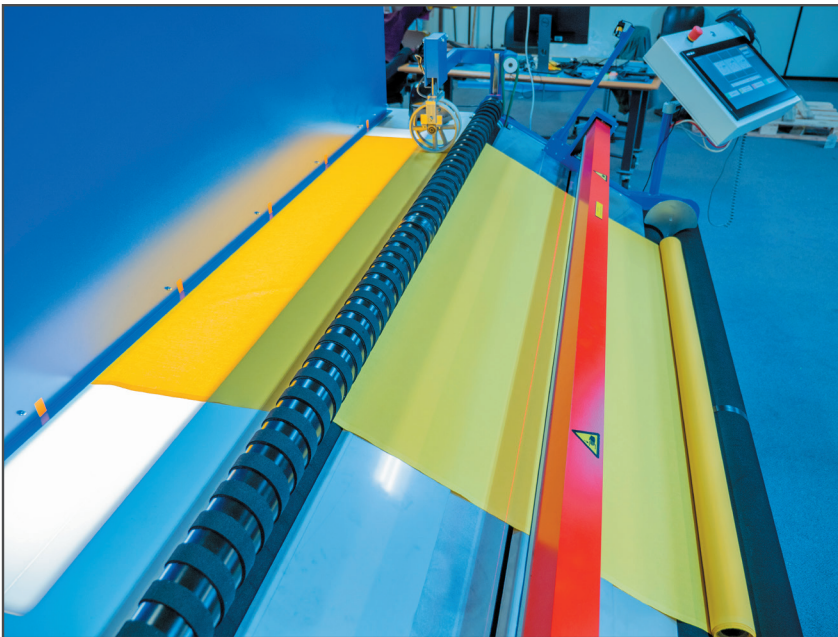
partial-and error free-roll can be used most efficiently for a particular order. In the administration, the total of the sub-rolls remains linked to the original meters of the parent roll, making it easy and efficient to reorder fabrics.

Collateral advantage

Thanks to the solution, pick-up and return movements in the warehouse have been halved. An unforeseen but welcome advantage. As the partial rolls are now all precisely measured, registered and pre-cut, complete rolls no longer need to be picked up, cut and returned to the warehouse. This saves 50% in the loading and unloading time. Reduced transport movements between the racks also improve safety.

Fate Basit, CEO of Sycade concludes: "In addition to tackling the initial problem, the solution has brought some very welcome additional benefits. We are convinced that our machine vision solution offers enormous opportunities for every organization in the manufacturing industry."

About Vadain

Vadain is the market leader in custom curtains in the Netherlands and is part of Venture Group. A holding company that is active worldwide and has more than 1000 employees. With a team of stylists and buyers, Vadain continuously researches global trends and developments in the interior design industry. Vadain releases two versatile and modern curtain collections every year. You can find these collections at the better interior designers in the BeNeLux. In the Vadain workshops, employees make curtains in all shapes and sizes from the thousands of available fabrics. Quality is one of the most important starting points. http://vadain.nl

About Sycade Group

For more information, please visit http://sycade.com or http://thesycadegroup.com.

About Omron

OMRON Corporation is a global leader in the field of automation, based on its core technology of 'Sensing & Control + Think.'OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to social infrastructure systems, healthcare and environmental solutions. Established in 1933, OMRON has about 30,000 employees worldwide, providing products and services in some 120 countries and regions. In the field of industrial automation, OMRON supports manufacturing innovation by providing advanced automation technologies and products, as well as extensive customer support, to help to create a better society. For more information, visit OMRON's website at http://industrial.omron.eu.