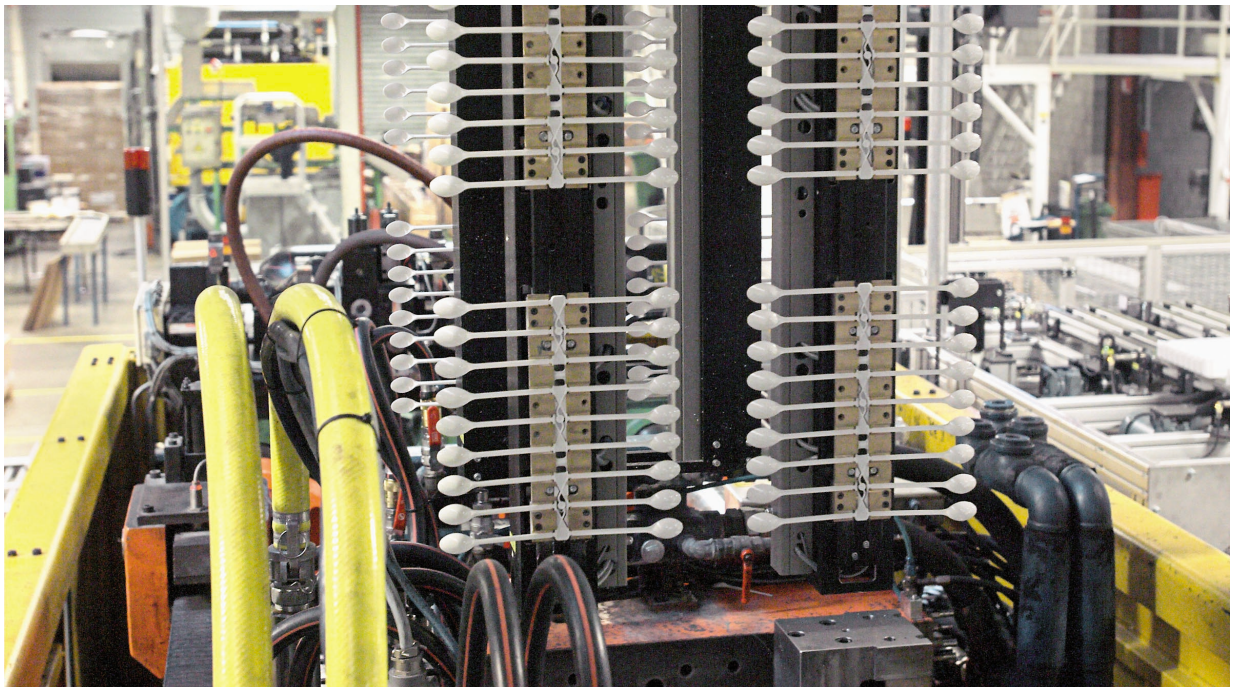
The heart of Robotics

Injection Moulding

Case study: Plastic spoons, deSter, Belgium

Applications in Plastics

- Cutting/Finishing
- Glueing/Sealing/Dispensing
- Flaming/Painting
- Assembly
- Packing/Palletizing
- Inspection/Quality control
- Machine Tending



When deSter developed a new production and packaging line for plastic spoons, it had high ambitions, including a cut in cycle times. The company more than met its goals.

World leader

DeSter is a world leader when it comes to plastic cups, mugs, plates, and cutlery. Its products are brought to the market as tailor-made concepts, meaning the company can provide a unique offer to its markets: Within a variety of brand lines, suitable product concepts are developed for each range of application. Speed and flexibility are basic concepts that underlie in all elements of the production process. These two concepts were also central to the development of a new production and packaging line for plastic spoons.

The new plastic spoon line was built with the demands of the market in mind. “Until recently, several packages for plastic spoons were delivered that were bulky and, in terms of appearance, no longer met requirements. Even the previous production methods for these products were questioned,” says Cis Woestenborghs, who as manufacturing engineer at deSter is responsible for, among other things, production development. “The market, however, wanted more choice. And that’s why a decision was made to develop a new line that could supply packaging units of 36, 50, 100, and 250, or even 500, 1000, or more spoons. With that choice, efforts were simultaneously made to find opportunities for increasing the production speed and capacity.”

New production line

The result is a completely new production and packaging line. The heart of the production line is a 400-ton injection molding machine with a 144 composite mold. In one shot, no less than 144 spoons can be injected simultaneously. Says Woestenborghs: “With the start of the new production and packaging line, we set ourselves ambitious goals: a higher production capacity, lower cycle-times, and a high degree of operator friendliness for the production line.” One of the existing comparable production lines had a

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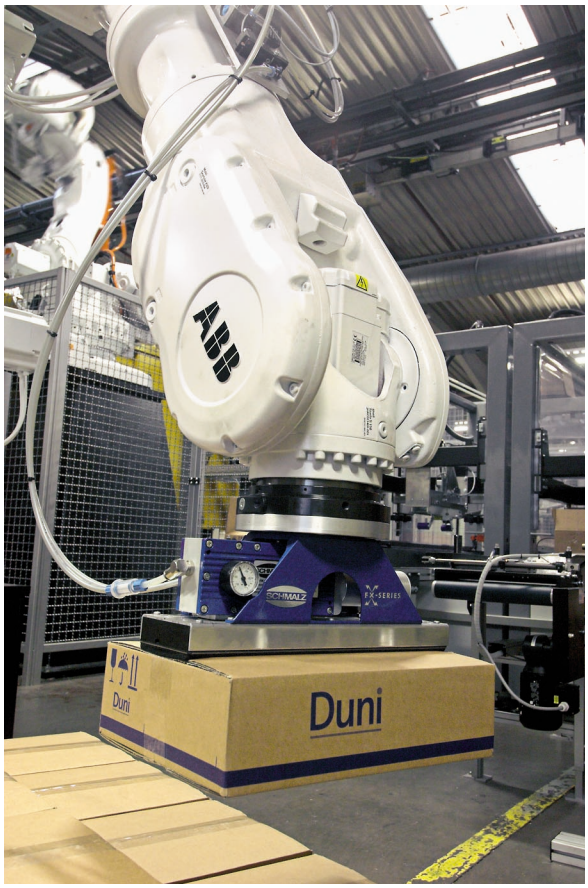

capacity of 700,000 forks per day and a cycletime of 9.5 seconds. For the new line, a doubling of the production time was envisaged and a reduction of the cycle-time by one second. Thanks to the robotization, even the packaging volume was reduced to approximately 35 percent – needless to say, this translated into significant logistical savings. The high degree of automation and robotization allowed for the achievement of the goals.

For unloading the products from the mold, a 6-axis IRB 6600 robot is employed. The robot is equipped with a gripper – developed in-house – that simultaneously picks up the eight cold runners and takes the 144 spoons to a trimming line. Thus 125 frames each with 144 spoons in buffer form are stacked, which are then transported to a trimmer via an elevator belt. The individual stacks of spoons are picked up with the aid of an IRB 2400 robot, and deposited in a buffer. Depending on the desired packaging amount, the spoons are then placed in multiples of 125 in a plastic package. A third ABB robot, an IRB 140, picks up the bag with spoons and places one or several units in the box. Finally, the boxes are transported via a transport line to an IRB 6600 robot for palletization. Just before the boxes are palletized, the robot moves them past an inkjet printer where the necessary product information is automatically affixed to the box.

Positive experience

The experience with the new line is outright positive, says Cis Woestenborghs. “DeSter pays a lot of attention to keeping staffing and machine output under control,” he says. “The departments receive all the facilities and freedom for implementing improvements. This not only concerns output increases, but also ergonomic improvements or cheaper production methods. With this system, the production activities have been further automated and staffing optimized. Relative to existing lines, production capacity has also been increased and the cycle-time reduced by one second. In addition, the stacking height of the spoon frames has been raised from 50 to 125 so that packages in multiples of 125 can now be supplied.” Van Dun adds: “The experience of operators also has been very positive. The new line is easy to use, and operation and communication are very user friendly. Furthermore, with ABB we have found a professional partner that supports us optimally so that the opportunities of the controller can be fully exploited.”

Facts about deSter

- Net sales in 2005: 207 million euro
- 1090 employees
- Headquarters in Hoogstraten, Belgium
- Founded in 1936 as a general trading house
- Refocused as a specialist supplier to the airline industry in 1973
- Four business units: deSter (Europe, US and Asia Pacific), Supplair

ABB and the Plastics Industry

ABB’s wide range of plastics robots can handle most of the tasks involved in and around injection mould machines, regardless of required cycle time or size of the machine. Together with our partners, we provide automation solutions for most manufacturing processes in the plastics industry.