

As the world fully embraces the digital age, the confectionery industry is one that continues to take strides in the adoption of automated, robotic technology. With shrinking costs of such systems and the unmistakable advantages of robotic machinery, an increased impetus for investment is evident with confectioners in both developing and established markets, from major market players to small and medium sized factories.

The figures speak for themselves – according to the International Federation of Robotics, worldwide industrial robot sales recently reached a record 380,550 units in 2017, a 29 per cent increase over the 294,300 units sold in 2016.

The food industry is a strong sector for growth, making up 19 per cent of the market last year. As this figure continues to grow, armies of robots are spreading throughout factories and warehouses around the world, working alongside confectionery manufacturers who are waking up to the benefits of intelligent machinery.

### Delicate handling

The step in the production process where you'll find the most investment in robotic technology is packaging, with many suppliers eliminating manual packing altogether in recent years and choosing pick and place technology to increase efficiency and speed. One company that continues to innovate in this sector is flow-wrapping specialist Cavanna, which recently presented a robotic unit designed to deal with delicate bakery products such as croissants.

With Cavanna's G-44 robotic unit – equipped with 2 Delta arms – the croissants are transported on a conveyor at 120/150 ppm and placed directly on the wrapper's chainless infeed. The gentle method uses vision technology to locate the baked good, before a Delta robot picks up the item using a combination of both suction and proprietary light grip technology.

The robotic technology can be used to package small muffins, cupcakes, Danish pastries and more, and is able to operate at around 86 delicate pieces per minute. What's more, the wrapping solution is completely based on the vision system with high-resolution linear cameras.

# Robot army



*Cavanna's latest robotics systems have been unveiled*

## Daisy Phillipson talks to leading suppliers of robotic technology for the confectionery industry to find out how their cutting-edge solutions are paving the way for a technological revolution

### Vision of the future

Vision systems provide a key component in relation to quality control of an automated line, as it means the robots are instructed to only pick products that meet certain requirements.

With this in mind, Bosch launched an enhanced version of its standalone Presto D3 top-loading collator, which is equipped with an air-blow ejection system that rejects products that are out of specification for improved quality protection and accurate filling. Designed for picking, placing and collating a wide range of products, the upgraded robotic platform gives manufacturers improved flexibility through its modular design.

A simple integration with upstream and downstream packaging equipment requirements, the machine is available with one or two infeed conveyors, allowing the products to be picked up, grouped and placed flat or on edge directly into cartons or the infeed chain of a sideload cartoner. For non-stop

machine operation, the reject station is followed by an automatic unjamming device.

### Gently does it

Keeping in mind the trend for robotics handling fragile products while boosting efficiency, leading packaging experts Gerhard Schubert recently supplied Belgian biscuit supplier, Destrooper-Olivier, a packaging solution for its almond biscuits, which are wafer-thin and feature almond flakes.

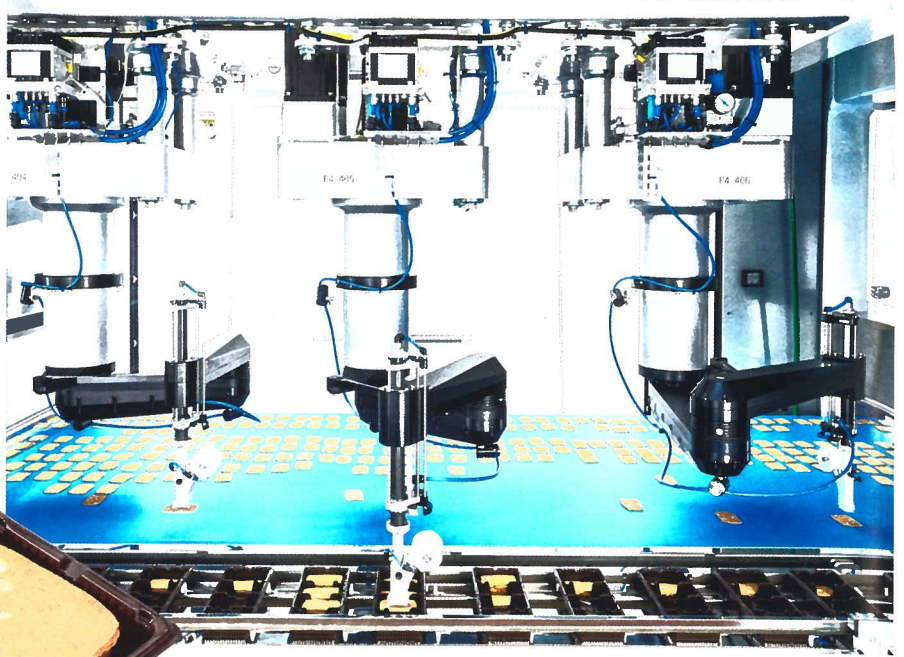
Speaking about the requirements, Schubert project manager, Georg Koutsogiannis, said: "An essential requirement was a precise packaging unit, capable of handling the products with great care, and also to be a top performer. The unit also had to be compact."

The installation, which consists of only four TLM sub-machines, packs the biscuits in three different tray formats. In the first submachine, F3 robots take

Gerhard Schubert has placed a strong emphasis on its robotics for confectionery

over unstacking the plastic trays from the magazine and places them on the conveyor belt for further transport to the next sub-machine. There, pick-and-place robots load the trays with the baked goods. Currently, the products are packaged in three different tray formats with three to four compartments.

The individual biscuits, which arrive using the patented Schubert counterflow system, are separated by a spreading belt before the scanner determines their precise position on the belt. The data from the position determined in this way is used to control nine F4 robots positioned in a single row.



Biscuits processed on Schubert systems

This ensures that the pick-and-place robots pick up the individual products precisely at the centre with a vacuum suction pad and place them gently into the tray cavities.

"The compact design of our TLM packaging machine without an electrical cabinet and the installation of three F4 robots within a single frame made it possible to achieve the required high speed and precision, while at the same time, ensuring optimum accessibility," added Koutsogiannis. This is just one example of how Schubert provides bespoke, integrated and innovative packaging solutions for food manufacturers across the globe.

**Finding the right solution**

Also supplying innovative packaging solutions is Cama, a leading provider of packaging lines and systems across confectionery and bakery products. The company recently showcased its IF316 – a compact forming, loading and closing system which operates through integrating a robotic twin-axis former, a loading system with a four-

axis delta robot and a closing system with a two-interpolated axis robot with a customised lidding tool.



Country Chefs Desserts in Australia invested in an IF316 to package banana bread slices in a variety of packaging formats.

"The company recently upgraded its slicing and flow wrap machines and needed an advanced end-of-line packaging solution to exploit and leverage the new efficiency and speed gains," explained Cama Group marketing director, Annalisa Bellante.

Replacing a labour-intensive manual operation with a machine like the IF316

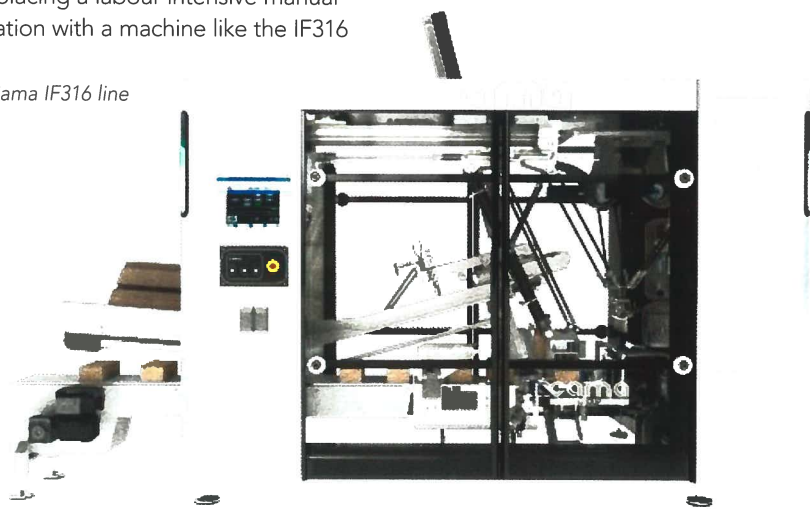
ultimately provides small businesses with much greater efficiencies. In this case, it allowed Country Chef Desserts to compete more readily on a national level, supplying the biggest retailers.

**Where robotics meets chocolate**

Of course, it's not just packaging where robots are taking over – Bühler is among those at the forefront of innovation when it comes to chocolate production using robotics. To overcome the challenges relating to traditional facilities that require a lot of space, the company invented the ChocoBotic – a small batch moulding line that uses smart technology and opens up a multitude of possibilities.

The system has a modular structure, and can be expanded. The vertical transporter moulds prevent foreign

The Cama IF316 line



material from getting into the empty mould and make it easy to visually monitor the process. Meanwhile, the Bühler depositing technology enables ribbon and one-shot depositing, as well as decoration applications for the addition of nuts or other ingredients.

A single operator can programme and control the ChocoBotic on the mobile panel, meaning he or she can determine the sequence and duration of the individual steps of the fully automated production process. The quick changeover allows production of several batches or recipes in a single shift.

"This makes it easier to develop new recipes," said Josef Zotter – chocolatier and founder of Zotter Schokoladen. "And they can be implemented much better and much more accurately." The company's production manager, Gerald Prasch, added that they are now more flexible, and have less cleaning issues because of the missing chains.

Not only is Bühler's ChocoBotic the next step into the future of chocolate product manufacturing, but it also goes to show how the industry is changing – robotic technology is at the forefront of innovation.

### Robots and cobots

Another pioneer in the sector is ABB Robotics, a company that remains ahead of the curve when it comes to developing industrial robots and robot software. As pointed out by Alan Spreckley, ABB's global industry segment manager for food and beverage, historically robotics were predominantly used in packaging. "However, more and more they are being used in food processing," he said.

ABB has been robotising the food and beverage industry for more than two decades with a portfolio that includes picking, packaging and palletising robots – it even introduced the world's fastest delta robot, IRB 360 (also known as the FlexPicker) 15 years ago.

In terms of recent innovations, the company continues to strive towards helping suppliers ensure they are Industry 4.0 ready. "As part of our journey towards helping customers realise the potential of the internet and helping them prepare for the factory of the future, we introduced ABB Ability Connected Services," explained

Spreckley. "The cloud-based platform is an evolution of ABB Remote Services which we introduced nearly a decade ago, and is a sophisticated suite of services that can reduce incidents by up to 25 per cent and speed response time by up to 60 per cent."

Another trend is the increasing range and type of robot, as they vary from flexible mechanical limbs to smart machines that can work alongside humans. Collaborative robots, or cobots, are specifically designed to interact with people to improve flexibility.

This might include software that allows a person to safely work in close proximity to a robot without shutting it down, or it could include collaborative robots such as ABB's YuMi, which is designed to work side-by-side with people on shared tasks. Collaborative automation improves flexibility by allowing people to contribute their unique adaptability and problem-solving skills, while robots contribute tireless endurance for repetitive tasks.

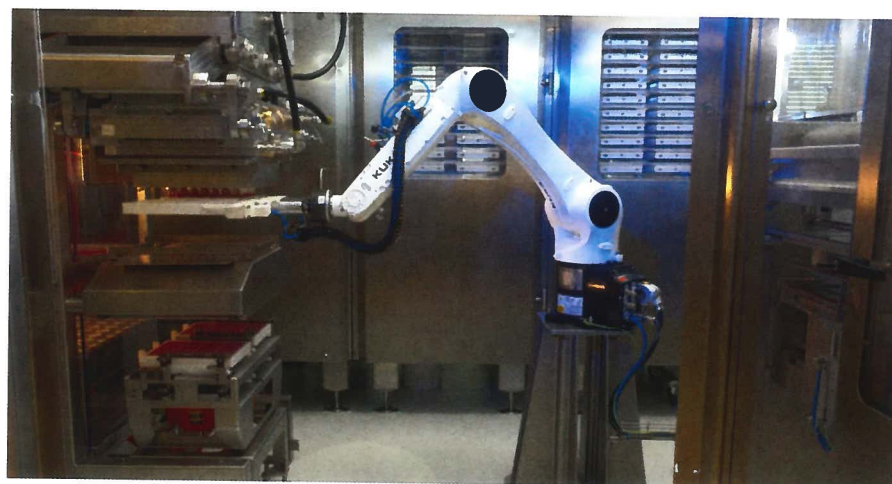
These are just a number of the technologies on offer from ABB. As such,

the global leader continues to develop and innovate, while its robotic systems have become the solution of choice for many global blue chip companies and small food processors that want to stay ahead of the competition by utilising the most cost efficient, versatile and reliable products available.

### The future is bright

We have only just skimmed the surface of the robotic innovations available on the market. And with considerable growth set for the adoption of such technology, it looks like this is only the beginning.

As ABB's Spreckley concluded, safe and flexible collaborative robots are only the starting point – the full benefits will come from collaboration coupled with digitalisation, connecting robots to the broader manufacturing ecosystem. There are opportunities at each stage of the automation lifecycle to take advantage of the information we receive from connected robots; and with this in mind, the future appears bright for the robotic sector. ♦



Buhler's chocobotic was a major release in 2018

