

FLEXIBLE IN AUTOMATION



Demaurex is an innovator and leader in flexible automation with parallel axis robotics technology. Abigail Saltmarsh reports on the company, which is part of the Bosch group.

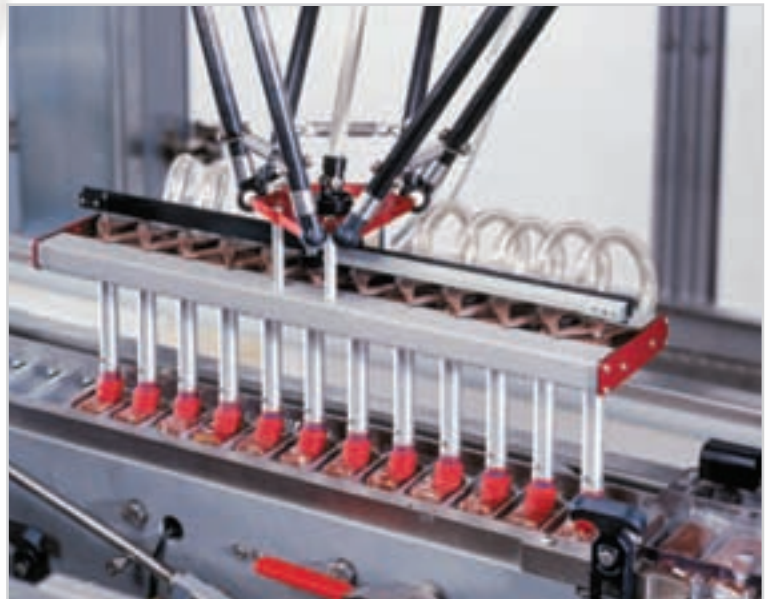
In the 25 years of its existence, Switzerland-based Demaurex has grown quickly in robotic applications. Today, the company, which is part of the Bosch group, is an innovator and leader in flexible automation using parallel axis robotics technology.

This, according to product manager Dragan Dragojlovic, is due to the company's long experience in the business, which puts it several steps ahead of its competitors in innovative flexible automation solutions for the packaging industry.

"The main difference between us and other robotics manufacturers in the same field is the 20 years' experience we have in Delta robot technologies," he said. "We shared a patent with ABB for this technology but that came to an end last year."

A unique robot

Demaurex was founded in 1983 by Marc-Olivier Demaurex, as a company specialising in flexible automation solutions. In 1988, it began development of the Delta robot under the licence of the Swiss Federal Institute of Technology of Lausanne (EPFL).

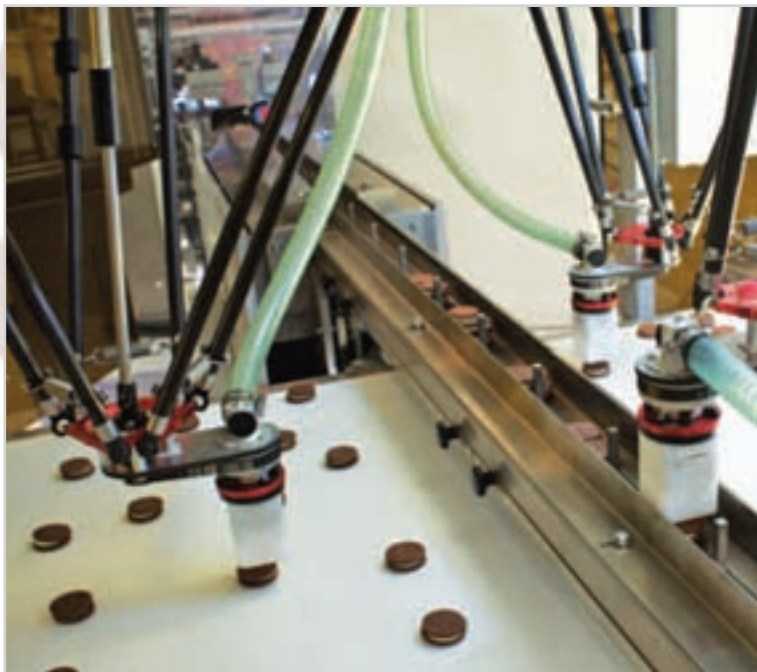


By 1992, the company had sold its first Delta robot packaging application to Roland, where the first application was a landmark installation of six robots loading pretzels into blister trays. From then on, the successes followed, and in 1996 the company sold its first vision-guided Delta robot installation to Nestlé – a chocolate assortments packing line of seven robots, installed in Switzerland.

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Soon Demaurex began to focus on the packaging industry. It joined the SIG Group to link Delta robot technology with the other packaging technologies of the SIG group and developed a standard machine strategy, developing standard products focused on bringing flexible automation to even low-end producers. The result of this development was its top loading and feed placing products.

In 2004, the Bosch Group purchased the SIG Pack division from the SIG Group and Demaurex was incorporated into the Packaging Technology division of Bosch. ▷



Part of Bosch

Today Demarex has 80 employees and an annual turnover of CHF22 million. It offers flexible automation packaging solutions for top-load packaging, and pick-and-place feeding of many types of packaging machines such as wrappers, cartoners, and thermoformers.

The company remains part of the Packaging Technology division of Bosch. This business unit of the global group is the world's largest supplier of packaging technology. Its core competences are the packaging of liquid pharmaceutical products; complex, customised systems; form, fill and seal technology; excellent service; and a strong international presence.

"The focus is high speed and fast delivery," said Jonathan Titterton, general manager of Demarex.

Fast and accurate

The Delta robot was developed by Demarex into an innovative solution for the packaging industry with some unique advantages. The mobile structure of a Delta robot resembles an upside-down tripod.

The robot segments are not in succession as is typical with conventional robots; instead the segments form three closed loops, called joint plan polygons. This kind of robotics is called parallel geometry robotics where all joints of a loop are dependent on each other and therefore each joint has the ability to change the position of the entire polygon structure.

With this kind of polygon structure, an actuator is not required at every joint and, in addition, it is possible to locate the required actuators so that they are in fixed positions and do not move with the polygon structure. As a result, all large masses have been removed from the moving structure, and the Delta robot arms are able to move at exceptional accelerations – up to 10 times the acceleration due to gravity.

In addition to the advantages of the parallel axis geometry of the Delta robot, significant advancements in material science have made the Delta robot more robust and ideal for the packaging industry. All of the robot segments (arms, forearms and joints) are made from composite materials designed for strength and long life. None of the joints require lubri-

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cation and each joint has extremely low wear characteristics. The robot is controlled by a Matrox 4Sight M industrial vision system.

Once the image is captured, it is processed with the Matrox Imaging Library. The GMF module locates the chocolates on the conveyor and sends the coordinates to the robot. Once the robot has the chocolate, a second camera acquires an image of the destination tray so the 4Sight M can pass the destination coordinates back to the robot.

Up to 400 products

Today, explained Mr Titterton, the company sells four standard products – the Presto, Delfi, Paloma and Astor. The Presto is a machine for collating products and placing them into cartons, trays or wrappers with the advance tracking of a Delta robot. It comes as a top loader or feed placer and can handle up to 400 products per minute. It has maximum flexibility – a production changeover by one person takes place in 10 minutes with an inexpensive changeover of parts. It has advanced product tracking for precision placement even when products are in motion, and adapts to changes in production flow with speed control of the wrapper or carton when applicable.

The Delfi is a cross belt robot feeder, which places production directly into wrappers or thermoformers, blisters or trays with vision-guided high-speed Delta robots. Up to 400 products can also be placed directly into the lug chain of a wrapper per minute, with no product guiding required.

The Paloma also comes as a top loader or feed placer. As an inline robot feeder, it can place production directly into packaging machines with the flexibility and speed of Delta robots. It can handle up to 160 ▷

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products per minute with a two-robot cell and up to 80 products/minute with a one-robot cell. Production changeover can take place in five minutes, also with inexpensive changeover of parts.

The Astor is an assortment packer with vision-guided high-speed Delta robots. It can handle up to 140 assortment packs per minute and again product changeover can take place in five minutes with an inexpensive changeover of parts.

Whole production line

Following a rigorous selection process, the La Normandie Company, in Vire (Normandy, France), commissioned Demareux to design and build a fully automated packaging line for cat food. The main factors taken into account were the high rate of production, flexibility in transferring from one type of production to another and the price per performance ratio of the system.

The objective was to load either a flow-wrap machine, to produce a 100g Doypack stand-up pouch, or a twin Paloma feed placer for the filling of top-load cartons in various sizes. The whole production line,

The production rate is 440 products per minute for both versions. For this application, two-pack placer cells of the Astor type were set up.

which includes a flow-wrap machine, carton erecting machine and carton sealing machine, is new and fulfils the requirements of the growing demand for these products.

The pouches are loaded onto the lug chain in such a way that assortments of two to four different flavours can be packed. The production rate is 440 products per minute for both versions. For this application, two-pack placer cells of the Astor type were set up, each with two Delta robots, together with a Paloma Special top-load cell which also has two Delta robots.

The Astor, which is the first part of the production line, loads up either the lug chain for the flow-wrap machine or the lug belt for the Paloma, which is the second part of the system and which then fills the cartons. On four in-feeds, the products are laid onto the belts in such a way that they do not touch each other.

A strong position

Demand is high for all machines, said Mr Titterton, and changes geographically. "At the moment, for example, Benelux is seeing strong demand for the Astor, while in France it is the Paloma and Delfi," he said. "We serve the whole of Europe from our base here in Switzerland and we expect to see strong growth. Our strategy now is to grow in different markets, such as the UK and Germany, for example."

He added: "As costs of labour go up, and more and more people turn away from repetitive jobs, automation will become increasingly popular. The challenges we have ahead of us are increasing our sales, and making our customers aware of the advantages of automation while also ensuring that they have realistic expectations." □

