

Automation with robotics increases production by 40% at BOLÇİ Fixed robots reduce workforce requirements by 20%

BOLÇİ Bolu Chocolate was formed in 1992. It now has over 300 employees and makes over 800 different products. The company produces over 200 tons of chocolate items each month. The BOLÇİ Bolu Chocolate Factory covers an area of 20,000 square metres, half of which is the production area, warehouses and other departments.

BOLÇİ needed to meet its promise of delivering chocolate products that are 'untouched by human hand'. Omron and Innovas joined forces to commission a line of three Omron robots in the packaging section of the factory's production line, with the aim of enhancing production quality and reducing labour costs.

The challenge: improving production capacity and efficiency

BOLÇİ currently exports to 13 countries, but wants to increase this number each year. It also wants to build its production capacity and efficiency; minimise any production errors; and improve its infrastructure.

Prior to introducing the Omron robots, the chocolates were placed manually into dividers in the packaging area. However, the company faces seasonal variations in demand and at special occasions in the year. As a result, sales could increase on a daily basis and the production needed to be adjusted accordingly.



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Innovas is one of the leading integrators in the food industry and the system integrator for this project. Before the robots were commissioned, Innovas performed analyses of the filling time for the different dividers that would be used when the line of robots was established. It also carried out feasibility studies on issues such as whether robots would be a suitable solution for picking and placing the chocolates.

Innovas therefore looked at the production capacity required and the range of products to be used. Based on the results, the company developed the robot application in conjunction with Omron. Innovas also stressed the importance of BOLÇİ developing a culture of working well with robots.

Choosing a solution

The integrator looked for a compact solution for this project and wanted to be able to supply everything from a single channel. Innovas has been using Omron products for many applications over the years, including programmable logic controllers and servo systems, and knew that it could meet the needs of this project. Omron also has considerable experience in pick and place applications for chocolate and fast food products.

When Omron was asked to recommend a suitable robot, it first made an assessment of the needs. The type of products on the production line could vary very quickly

and BOLÇİ needed different types to be arranged rapidly in the same style of box. Omron therefore suggested its four-arm Quattro robot, which is compact and has a unique kinematic structure.

Innovas subsequently chose this model, which is amongst the fastest in the world in its segment. The company selected the robot because of its speed and flexibility as well as its ability to cope with the variety of products in the box. Omron also recommended its PackXpert programme, which uses a wizard-based user interface and meets the needs of applications in the packaging sector.

Omron has brought its innovations, including its robots, together in the form of i-Automation! – a concept based on developing the intelligent, integrated and interactive automation systems of the future. These systems will help manufacturers to achieve higher levels of efficiency, flexibility, safety, integration, quality and connectivity.

Innovas installed three Omron robots for BOLÇİ. These are now used to pick and place the chocolates into the dividers, which has saved time and minimised the amount of labour required. The three robots work in sync with each other as part of an integrated system that includes visual inspection, safety and the robotic systems. Because chocolate is a very delicate material, it's important that its shape doesn't deteriorate during the process. This requires accurate positioning and a very precise handling of the product.



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The robots determine how many pieces will be put into the system each day and enable a repeatable quality and standard to be achieved. Faster and more productive production can be achieved by giving simple tasks to personnel who have no experience with the robot. This is possible partly because Omron's PackXpert solution is very user-friendly.

The benefits: Putting the solution into practice

So, how does the new system work in practice? One person places the dividers on the conveyor and another feeds chocolates through the 12 feed channels. There is also a final visual check on the output of chocolates before they are sent to packaging.

The chocolates are brought to the robots by conveyors. The chocolates can be at different angles but the camera system checks them and the robots capture the products with a vacuum system, based on the position and product information determined by the camera.

In the packaging area, the three robots place the chocolates into boxes and dividers. BOLÇİ has about 40 boxes of different sizes and types. On a screen, the operator chooses the boxes to be filled and the appropriate mechanical adjustments are made. The system has four different chocolate feeding entry points for each robot. Up to 12 different chocolates can be stacked in four boxes at the same time.

The new robots have resulted in a 40% increase in production capacity and a 20% workforce saving. They have also enabled BOLÇİ to give shorter deadlines to its

customers. At the same time, the company has been able to re-route the savings in manpower to non-automated areas of the factory. The robots have helped BOLÇİ to reach its required production quality standards by minimising production errors and by enabling the company to provide quality, hygienic products (still untouched by human hand) to its customers.

The future: Moving towards Industry 4.0

In the future, BOLÇİ plans to increase its production capacity by extending the number of Omron robots it uses on the existing line. The company aims to complete its automation processes by implementing similar projects, with the ultimate objective of becoming a smart factory that can comply with Industry 4.0.

BOLÇİ Chocolate Vice Chairman, Deniz Aksoy, comments: "Innovas and the Omron robots met all of our expectations. Due to their meticulous approach during the analysis, we have increased the efficiency of the line in a short period of time.

"This investment is an important step towards our goal of the transition of our factory to Industry 4.0. Through this project, we have transformed one of our business processes by automating it. This has provided a good start that will help us to apply concepts such as the Internet of Things and Industry 4.0 as we move towards the full automation of all our processes in the future."

About BOLÇİ

BOLÇİ (Chocolate of Bolu) is the famous and official chocolate of the city of Bolu, made of chocolate, covered by croquant made of nuts. BOLÇİ is a chocolate brand of Deniz Gıda Sanayi, founded in 2000. BOLÇİ leads the way in the list of traditional food unique to Turkey, and is also at the top of Bolu's brands list. The factory started production in 2002, and has now been replaced by a new and modern plant equipped with state-of-the-art equipment which are designed by BOLÇİ and produced by Turkish and foreign engineers together, and can produce 180 tons of BOLÇİ per month.

About Omron

Omron Corporation is a leading industrial automation company that leverages its core sensing & control technologies to expand into businesses, such as control components, electronic components, automotive electronic components, social infrastructure, healthcare, and the environment. Omron was established in 1933, and has around 36,000 global employees, offering products and services in over 117 nations and regions. In the industrial automation business, Omron is contributing to making an affluent society by offering automation technologies which drive innovation in manufacturing as well as products and customer support. For more details visit: industrial.omron.eu.