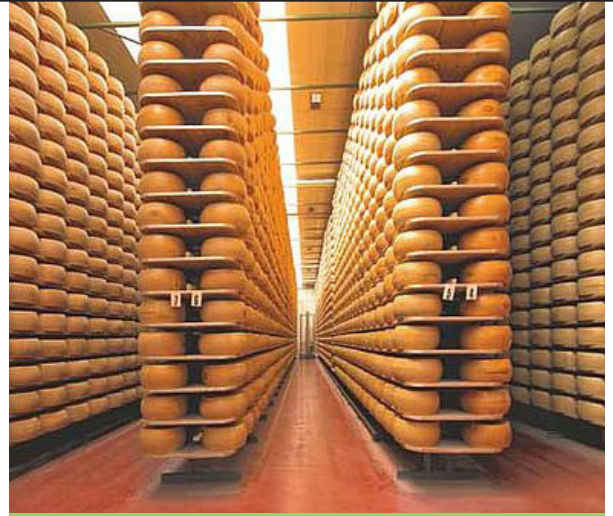


Automating back-breaking manual cheese handling with food-safe pneumatics

RESULTS

- Eliminated manual effort and injuries from forming and turning 40-kilogram cheese wheels
- Replicated artisanal processes with carefully controlled pressure and tension
- Maintained high hygienic standards required by the specialized food industry
- Ensured components are easy to service, clean, disinfect, and maintain
- Provided optimal design for supporting decentralized locations



APPLICATION

Automating traditional cheese-making processes

CUSTOMER

Progema Engineering, Borgo Virgilio, Italy

CHALLENGE

Grana Padano and Parmigiano-Reggiano cheeses have been produced in their region of origin, the Italian Po plain, for more than 800 years. The traditional production process for these two types of cheese has essentially stayed the same for centuries. During the months of their maturation process, the products have to be formed and turned.

Pressing out the whey and turning the resting heavy cheese wheels is back-breaking work. During the month-long maturation period, the cheese wheels have to be carefully tended to and turned regularly. Today, however, automation technology is increasingly employed to make this hard graft easier, because the famous cheese varieties not only need a great deal of time, but above all, meticulous care.

Machine forming and turning

“Often, these tasks are still carried out manually. With the help of our new Forma4 machine, however, producers can automate the process,” says Boceda, head of mechanical engineering and co-owner of Progema Engineering S.R.L.

“All components used for our systems have to meet the high standards of the food industry. We always guarantee that our machines are food-safe, despite customizing them to individual customer’s needs. That’s why we decided to use pneumatic components from Emerson.”

Daniele Barbieri

Co-owner and Head of Electrical Engineering at Progema Engineering

The Italian company, located in Borgo Virgilio, in the province of Mantua, has 15 employees and is specialized in innovative dairy equipment. In its “Milk” division, it offers development, design, and manufacturing of specialized equipment used to automate cheese production. This includes, above all, automatic storage and cleaning systems according to the CIP principle (Cleaning in Place) for process engineering systems in the food industry.

The Forma4 machine adopts the forming and turning of Grana Padano and Parmigiano-Reggiano cheese wheels. The cheese mixture, obtained through a unique method, must first rest for two to three days in round forms called “fascere.” Subsequently, the resulting wheels are repeatedly dipped in brine over the next three weeks and then stored for at least one year in air-conditioned storage rooms until complete maturity. During this maturation period, the cheese wheels are meticulously cared for and repeatedly turned, cleaned, and inspected.

“In cheese production, all components have to comply with premium standards and endure countless cleaning sequences,” explains Boceda. “Therefore, the right choice of components and their materials is just as important as the use of hygienic components that are easy to service, clean, disinfect, and maintain.”

SOLUTION

During the 25 years since the company was founded, Progema Engineering has gained extensive expertise with dairy applications and knows what really matters. “All components used for our systems have to meet the high standards of the food industry. In addition, we always guarantee that our machines are food-safe, despite customizing them to individual customer’s needs. That’s why we decided to use pneumatic components from AVENTICS™ when configuring our Forma4 machine for automation,” says Daniele Barbieri, co-owner and head of electrical engineering.

Corrosion-resistant, double-acting Emerson cylinders from the AVENTICS ISO Clean Line (CCL) series close the round molds and ensure that the whey is pressed out by applying the appropriate pressure. Later on, when the cheese wheels are turned, the cylinders keep the mold under tension. The AVENTICS CL03-EV valves regulate cylinder movements and are installed directly on the consumer. The CL03-EV valves are ideal for such applications due to their tailored design and the high protection class of IP69K. The AS05 series maintenance units ensure the right compressed air preparation and complete the installed pneumatic system.

Hygienic and food-friendly pneumatics

“The Clean Line concept from Emerson immediately convinced us,” confirms Alberto Boceda. He also lists the consultation and integration of the pneumatic specialists during the construction phase of the new system as deciding factors in the selection process.

“The regular turning of the approximately 40-kilogram cheese wheels is not an easy task and can quickly lead to back pain in employees. Instead, our automatic turning device takes over this monotonous, heavy-duty work and completely eliminates that problem.”

Daniele Barbieri

Co-owner and Head of Electrical Engineering at Progema Engineering



During the month-long maturation period, the cheese wheels have to be carefully tended to and turned regularly.

Thanks to their protection against high-pressure water and steam jet cleaning (IP69K) and hygienic design, Progema Engineering can install the individual valves of the CL03-EV series in decentralized locations. By using them directly on the actuators, the compressed air lines are shorter, which minimizes dead volumes and pressure losses, and reduces air consumption.

Safety through “best-in-class”

Emerson’s long-term expertise in the design of hygienic components plays a vital role, demonstrated by the unique features of the “best-in-class” components, which have been specially designed for optimal food safety. This means no indentations or sharp edges, use of food-grade materials and lubricants, as well as high resistance to chemicals and corrosion. The overall design facilitates cleaning, disinfecting, and sterilizing of the machine, thus reliably preventing the risk of microbial contamination.

Progema Engineering uses individual valves in the Forma4. “The modular valve system offers countless possibilities, and this solution corresponds exactly to our requirements in the standard machine. However, depending on the need and specific end-use in a dairy, we can easily expand the CL03,” says Daniele Barbieri.

Customized automated warehouse systems

The mold turning device equipped with Emerson pneumatics is one of the components of the automated warehouse system that Progema Engineering offers its customers. The modern system with several storage levels requires significantly less storage space, facilitates access to the molds, and creates ergonomic workplaces with individual height settings.

As an optional supplement to this modular, expandable concept, customers can use the Forma4 device for further automation. In the production of Grana Padano and Parmigiano-Reggiano, the Forma4 machine is used on the first day to remove the excess whey and form the cheese shapes. In further steps, the cheese is repeatedly immersed in brine for 21 days, followed by seasoning in the last phase.

“The regular turning of the approximately 40-kilogram cheese wheels is not an easy task and can quickly lead to back pain in employees. Instead, our automatic turning device takes over this monotonous, heavy-duty work and completely eliminates that problem,” emphasizes Daniele Barbieri.

This makes the Forma4 turning device a sensible investment—especially considering that about 3 million wheels of Parmigiano-Reggiano and approximately 5 million wheels of Grana Padano cheese are produced in their region of origin each year.



AVENTICS CL03-EV valves regulate cylinder movements of the Forma4 machine and are installed directly on the consumer.

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