



Galdi: PC-based control meets all requirements for modular packaging machines

## Twelve-thousand cartons filled with fresh milk per hour

The strength of Galdi's packaging machines is their high flexibility: The filling machines can fill 1,000 to 12,000 gable-top cartons per hour with carton base measurements ranging from 57 x 57 mm to 95 x 95 mm and volumes ranging from 250 milliliters to 2 liters. In order to be able to meet the high requirements in the packaging market regarding openness towards common standards, flexibility and reliability the machine builder chose to employ PC-based control from Beckhoff. With this modular control technology Galdi can adapt its standard machine designs quickly and easily to varying customer specifications.





Galdi offers a broad portfolio of filling machines for milk, dairy products and fruit juices.



Company founder Galdino Candiotto. His success story began in the 1970s, when he developed a filling machine for the dairy owned by his family.

It all started over 40 years ago, when Galdino Candiotto developed a semi-automatic filling machine to make the milk packaging operation in his family-owned dairy more efficient. When other milk producers who also wanted to automate their filling operations besieged him with inquiries about his invention, he decided to enter the machine manufacturing business. Today the company employs 70 people and exports 90 percent of its machines all over the world. Galdi's core business consists of equipment for filling gable-top cartons of many types with a wide range of dairy products, fruit juices, as well as liquid and semi-liquid food products. The company's wide product portfolio also includes machines for filling plastic (PET) bottles and cups.

#### Standard model fulfills individual customer requirements

"For us, as a maker of packaging machines, the challenge involves creating ever more powerful and customized machines in a market that demands flexibility and user-friendliness," explains Galdi marketing manager Alessandro Ferraris. "Our key technology is the filling machine – its modularity enables our solutions to meet the widest possible range of customer requirements." Galdi sells a broad portfolio of standard machines with a modular design that can be adapted to each customer's specific needs. This approach makes it possible to deliver "quasi-customized" models at the price of a standard machine.

"Our machines cover a wide performance range from 1,000 to 12,000 cartons per hour, with various container formats and volumes. While the basic chassis of the machine remains unchanged, we can meet the customer's individual requirements by integrating additional modules such as those for filling cold milk or warm fruit juices, for ultra-clean filling applications (UCS), or for applying screw-caps," explains Ferraris. "The openness of the PC Control solution from Beckhoff matches our approach perfectly."

To deliver constant quality on time and be able to accommodate future requirements, Galdi operates in accordance with the "lean thinking" concept. "This also applies to the project and product development phases," emphasizes Alessandro Ferraris. "That's why we work only with partners who support this approach, that is, we expect from them the same level of openness and flexibility that our customers expect from us."

#### PC-based control meets all requirements in terms of openness, flexibility and modularity

Galdi is currently developing two new filling systems for gable-top cartons that are equipped exclusively with Beckhoff control technology. "We looked at several control technology providers, but when tests of Beckhoff's controller platform delivered consistently positive results in several beta projects, we decided to deploy this solution in future developments," says Ferraris.

A control cabinet with a C69xx Industrial PC running TwinCAT 3 automation software, a CP6902 15-inch "Economy" control panel, three local EtherCAT terminal stations with a total of 450 I/Os, and four AX5000 EtherCAT servo drives for controlling seven motors are used as an integrated platform for PLC, motion control and HMI applications. Galdi uses EtherCAT as its communication system and Safety-over-EtherCAT for highly secure safety communication.

The system meets all of Galdi's requirements, which included a fanless PC platform with an embedded operating system and solid-state storage media,

1) The Ultra Clean System (UCS), which was developed in cooperation with the University of Udine, makes it possible to fill and sterilize containers in a monitored ultra-clean environment in order to make products last longer.



Marketing Manager Alessandro Ferraris at Galdi: "For Galdi, the challenge involves producing ever more powerful and highly customized machines in a market that demands flexibility and user-friendliness. We chose to work with Beckhoff as our partner, because the openness of their PC-based control solution fits perfectly with our approach."

the ability to upgrade software, firmware and setups via memory modules without external devices. Other needs included the ability to decentralize peripherals for applications like motion control, which reduces control cabinet size, using a real-time Ethernet fieldbus, compliance with the IEC 61131 and PLCopen programming standards, axis control with support for advanced algorithms, as well as the possible integration of advanced safety systems. "The openness and flexibility of the Beckhoff solution is also reflected in our ability to use motors from other manufacturers if the customer makes such a request," says Alessandro Ferraris.

Another feature in favor of the Beckhoff technology were the company's stainless-steel motors, providing a hygienic design according to EHEDG guidelines, which makes them ideal for use in food packaging applications. "On top of all that, the One Cable Technology of the Beckhoff drive technology reduces our wiring costs," adds Ferraris.

"In addition, the TwinCAT development environment provides excellent debugging features that enable us to trace all signals and the corresponding alarms clearly and completely. One of the absolute strengths of the Beckhoff solution, however, is the potential prototyping, i.e. the development and testing in the project phase, which has turned out to be a fantastic benefit for us," adds Alessandro Ferraris.

The format and volume of the gable-top carton are the most relevant parameters for the filling process. "With the standard carton base dimensions of 70 x 70 millimeters, for example, we can handle volumes ranging from 250 milliliters to 1 liter on a single machine. The customer can run various filling processes with great flexibility and does not even have to initiate cleaning procedures when



An intelligent metering system with a flow meter makes it possible to package liquids like milk or fruit juice, while a piston-based high-viscosity metering system is available for semi-liquid products like yogurt.

the carton size is the only thing that changes," explains Galdi's marketing manager.

"The Beckhoff PC-based control platform provides not only the necessary flexibility, but also the precision and repeatability which make our 100 % compliance with the customer's required tolerances possible," explains Ferraris. This kind of performance improves Galdi's strategic position in the highly competitive packaging equipment market, but that's not all: in addition to an attractive price-to-performance ratio, the complete openness for the world's most important standards, the flexible and user-friendly development environment, and the ability to integrate even proprietary software without losing any know-how are additional reasons why Galdi owner Galdino Candiotto is so pleased with his partnership with Beckhoff.

Further Information:

[www.galdi.it](http://www.galdi.it)

[www.beckhoff.it](http://www.beckhoff.it)