

Beverage cooling gets energy and cost benefits, supported by ABB drives



Before reaching store shelves, drinks from the most popular global brands flow through Frigel Group’s cooling plants. Based on years of experience in the plastics industry, Frigel’s intelligent process cooling technology is now also very appreciated in Food & Beverage for its high energy efficiency and accurate control, ensured by ABB drives.

Real innovation results from an effective combination of performance and sustainability. This has been the guiding principle of the Frigel Group since the 1960s, when Frigel Firenze was established just outside Florence, Italy, as the first vendor of fluid cooler heat-exchangers using only ambient air. With this system, initially mainly designed for the plastics industry, Frigel set the new benchmark for quality standards in the industry, as well as giving huge savings in both energy and water consumption compared to conventional technology.

Since the beginning of the new millennium, the company has grown into an international group, diversifying also into different markets, beyond its original plastics business. A key growth market has been Food & Beverage, as Leonardo Losappio, purchasing manager of the Florence-based company, explains. “We were already active in this sector with our packaging cooling systems, originally for preforms and then for bottles and closures,” Losappio says. “While expanding our focus to the entire beverage processing and bottling process, we realized that our technology was

perfectly fit to produce all kinds of beverages, including soft drinks, beer and soymilk.”

A new “PET & Beverage” division was therefore created by Frigel in Parma, the capital of Italy’s biggest food district. The mission was to develop the production and sale of big plants aimed at high-end customers, who would make repeat orders and replicate installations in many regions around the world, supporting the most popular beverage brands.

Focus on environment and energy saving

Filippo Malvolti, R&D manager at Frigel, explains that cooling systems for the beverage industry are centralized plants engineered to the specific load requirements of each application. The key components are 3FR modular air-cooled chillers with screw compressors, which allow adjustment of the cooling capacity to cover all heat variation and flow rate requirements. Frigel’s plants basically replace traditional ammonia chillers with modular chillers that minimize safety risks by using very small quantities of eco-friendly refrigerant (R134a; R513a) for each module, instead of a fluid like ammonia.

With the ability to offer this new technological solution, Frigel Group rapidly generated new business in markets like Beverages. Potential end customers quickly realized the benefits of this solution, not only in terms of efficiency and environmental sustainability, but also for energy and cost savings. This result was due to the possibility to more accurately control the cooling capacity of the pumps and compressors that circulate the coolant fluids.

Solid partnership with ABB

Frigel's mission builds on resource, water and energy savings and the company's expansion into the Food & Beverage sector has been boosted by the increasing use of variable speed drives (VSDs; frequency converters) to control pumps and compressors. The company is now harvesting the fruits of its hard work, having allowed the necessary time for the market to understand and appreciate the benefits of drive-controlled motors compared to fixed speed. Using frequency converters ensures perfectly accurate control of the speed of motors

that drive screw compressors and pumping units in the cooling process.

In this area, Frigel has chosen to rely on ABB technology through Marini Pandolfi, the partner of the Swiss-Nordic corporation in the Tuscany region. The business relationship between Frigel and Marini Pandolfi dates back more than twenty years and has strengthened over time with mutual satisfaction.

"For us, ABB is Marini Pandolfi," Losappio comments. "We rely on them for support, from selection to early prototypes, and up to the development of real products. They also help us solve the inevitable problems that arise in the field when you test new applications. And we have always received effective response within a short time."

It was thus a natural choice for Frigel designers to turn to their partner to identify the most suitable inverter to control the operation of new cooling plants for big customers in the beverage industry.



To achieve very accurate control of compressors and pumps, and consequently accurate adjustment of the cooling capacity, Frigel has adopted ABB's ACS580 drive, combined with ACS310 auxiliary units mounted on the pumping groups to circulate the coolant fluid between chiller and users. Each drive is controlled by a PLC programmed with proprietary logic.

Marini Pandolfi's support was critical to develop the interaction between the PLCs and ABB drives. Frigel's engineers wanted the drive to offer the best combination of sturdiness, easy programming and service. All these requirements were met using ABB technology supported by Marini Pandolfi.

According to Franco Soldi, Sales Manager for Industrial Automation at Marini Pandolfi, "Our task is to help customers find their way in a market that offers plenty of options. As the connecting link between ABB and end customers, we are expected to support customers in the selection of the most suitable products, especially in terms of functionality. To face competitors in competitive markets, companies need to identify products with properly designed functionalities, combined with top efficiency in terms of costs and benefits."

"Leveraging our twenty-year experience in these kinds of projects, we can speed up the development time to provide customers with benefits resulting from the selection of the right product for each application."

A recent order received by Frigel is the supply of 39 ModularChiller 3FR cooling modules for a manufacturing site in the Far East, operated by the world's most popular beverage brand. The different modules are connected hydraulically by pumping units that can be made up of two to four pumps, each controlled by an ABB drive. So, Marini Pandolfi delivers several hundred ABB frequency converters every year for Frigel installations all around the world.

For this reason, Marini Pandolfi is strongly focused on aspects such as the easy provisioning and implementation of products around the world, as well as costs and performance. At present, according to Gastone Bettarini, sales and technical manager of Marini Pandolfi, the ABB partner is delivering products to Frigel Group worldwide, directly from the Scandicci headquarters plant.



The Frigel group has manufacturing sites on four continents and includes the following companies:

- Frigel Firenze S.p.A, (Scandicci, Firenze Italy) Headquarters and Sales, Engineering, Service, Production
- Frigel North America Inc., (Chicago - USA) Sales, Engineering, Service
- Frigel Asia Pacific Company Ltd, (Bangkok - Thailand) Sales, Engineering, Service, Production
- Frigel Latino America Ltda, (Sao Paulo - Brazil) Sales, Engineering, Service, Production
- Frigel GmbH (Rheinfelden, Germany) - Sales, Engineering, Service
- Green Box Srl (Piove di Sacco Padova - Italy) - Sales, Engineering, Service, Production
- Frigel Intelligent Cooling Systems (Greater Noida, India, Join Venture with Matsui). New plant
- Frigel Eastern Europe Sp. z o. o. (Wielgolas Brzeziński - Poland)

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