Coca-Cola Andina Group opts for process-synchronised cooling solution

Connected cooling capacities

For its new facility for CSD products being built in Brazil, Coca Cola Andina Group opted for a new Ecodry Sytem – a "Process-Synchronised Cooling Solution" by Frigel. In the system, each cooling unit will be installed close to the processing line and digitally synchronised with it, providing the optimum cooling performance required at any given time according to actual product carbonation needs.

Coca Cola Andina Group is one of the most important soft drink processors in Latin America, operating 11 plants located in Chile, Brazil, Argentina and Paraguay. Its Brazilian branch, Coca-Cola Andina Brasil, is building a state-of-the-art facility in Rio de Janeiro that is intended to support the increasing demand for carbonated soft drinks and mineral water in the region.

The implementation of this new hi-tech plant is planned in three phases, with the installation of six latest generation, high throughput bottling lines supplied by Krones. The first phase of the project in 2017 will start with three lines delivering an expected production of 400 million litres of beverages per year, including the world's largest single bottling line, able to fill 78,000l/h. The project has been developed with latest technologies available today for CSD processing and designed with a modular concept in which each processing line is a separate "production/cost unit" to be operated and managed separately. This approach aims to give the new facility higher productivity, production flexibility, cost control and easy future expandability.

Process-synchronised cooling

Instead of the traditional "central" cooling system, with this ammonia-free, plug & play, modular concept, each bottling line will have its own Multiple-Cascade Refrigeration Unit (MultiStage) specifically designed for the application. Compact, inverter-driven, factory-built and pre-tested, each cooling unit will be installed close to the processing line and digitally synchronised with it, providing the optimum cooling performance required at any given time according to actual product carbonation needs.

For this first phase of the project, Coca Cola Andina is installing three MultiStage units rated for 450kW, 1,100kW and 2,200kW cooling capacities, connected to each of the three bottling lines rated for 33,000l/h, 48,000l/h and 78,000l/h respectively. Each one may operate at a different coolant temperature: from 20°C for carbonated water to 12°C for Coca Cola in 3l one-way PET bottles. Additionally, each cooling unit is also a "heat pump", so heat extracted from the beverage before carbonation is recovered, producing hot water up to 50°C to heat up the bottled product through warmer tunnels, thus avoiding condensation in the tropical ambient conditions of Rio de Janeiro.

To complete the system, the excess heat generated will be rejected to ambient with a central Ecodry Adiabatic Cooling System (instead of evaporative cooling tower), which provides the MultiStage unit condensers with maintenance-free, close circuit water with almost no water or chemical consumption.

The Adiabatic Cooling System, which will provide a cooling capacity of 1,500kW (with two coolers with 20 fans each) is being installed outdoors in the utilities area. One simple set of non-insulated piping mains and drops will connect it to each water cooled Multi-Stage cooling unit installed indoors and close to each processing line.

Coca-Cola Andina, after an extensive technical and economic analysis, chose Frigel's solution, as they perceived various advantages compared to a traditional "central" cooling system for their company.

Flexible coolant temperature control

These include that the "Process-Synchronised Cooling" gives flexibility of coolant temperature control supplied to each line, assuring with high precision the ideal product carbonation temperature according to the actual type of product and bottle format.

Cost savings of 30%

Constant flow rate is delivered to each carbo-mixer, ensuring stability and avoiding flow interference from other lines, while the bottling line runs steadily at the highest speed. Also, thanks to the multi-cascade refrigeration unit performance (EER/COP) per line, the 100% natural gas savings obtained by heat recovery for operation of the warmers and the 95% water savings for heat rejection, Coca Cola Andina has estimated an overall operating cost savings of 30% when compared to the traditional "central" cooling system option.

This new plug & play concept is easily expandable at any time, which will allow Coca Cola Andina to install only the precise capacity needed at every stage of the plant growth.

Also on the plus side: with 90% less glycol usage, almost no water footprint, no ammonia and a 40% carbon footprint reduction compared to traditional "central" cooling systems, this new Coca Cola facility will achieve high standards for overall sustainability.

www.beverage.frigel.com