

**Industry:** Food Processing

**Application:** Cooling Tunnel

**Product Descriptions:** Right-angle TF Spiral Nozzle (TFRA)

**Situation:** A BETE customer had an existing cooling tunnel that was used to decrease the temperature of freshly bottled juice from 65°C (149°F) down to 30°C (86°F) on a long conveyor. At the time, they were using a total of two hundred seventy right angle, hollow cone whirl nozzles to spray 235 gpm (890 L/min) of re-circulated water at 12°C (53°F) over the bottles to achieve proper cooling. They now wanted to increase their cooling capacity so that the bottles would exit at a temperature of 20°C (68°F). They were willing to drop the temperature of the cooling water to 8°C (46°F) and they were looking for additional recommendations.

**BETE's solution:** Based on the performance of the cooling tunnel, BETE Applications Engineers calculated that the customer's existing layout would require roughly 460 gpm (1740 L/min) of water at a temperature of 8°C to achieve this new target. Always a leader in innovation, BETE suggested switching to a custom TFRA series nozzle, which is a low profile, right angle spiral nozzle. Spiral nozzles are known for their small drop sizes, which are ideal for heat transfer, and the full cone spray pattern would offer better distribution than the hollow cone pattern that they had been using. After conducting a small-scale test, the customer found that simply switching the nozzle led to a noticeable increase in cooling efficiency. Based on the data from their test results, it was calculated that by directly replacing the whirl nozzles with TFRA6FCN nozzles, the process would only require 400 gpm (1515 L/min) of water at 8°C (46°F) to achieve the new desired outlet temperature. This is a savings of 3600 gallons (13630 liters) per hour over the equivalent whirl nozzle layout, resulting in lower pumping demands and operating costs.

### Technical Questions?

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