BETE®
PERFORMANCE SPRAY ENGINEERING

Application Solution

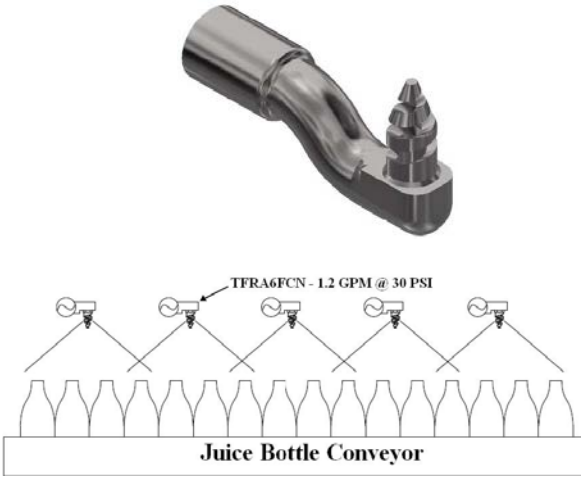
OPTIMIZE BOTTLE COOLING WITH BETE SPRAY TECHNOLOGY

BEVERAGE PROCESSING INDUSTRY

COOLING TUNNEL SOLUTION

▶ PROBLEM: UNDESIREABLE RESULTS IN COOLING SYSTEM

A bottling company needed to increase its cooling capacity to achieve an exit temperature of 68 °F (20 °C) for the bottles. Their existing cooling tunnel reduced the temperature of freshly bottled juice from 149 °F (65 °C) to 86 °F (30 °C) along a long conveyor. Their setup utilized 270 right-angle, hollow cone whirl nozzles to spray 235 gpm (890 l/min) of recirculated water at (53 °F) 12 °C over the bottles for proper cooling. Willing to lower the cooling water temperature to 46 °F (7.8 °C), they sought additional recommendations to achieve their goal.



▶ SOLUTION: LOW PROFILE RIGHT ANGLE TF SPIRAL NOZZLES

BETE engineers determined that the customer's existing 270 nozzle layout would require approximately 460 gpm (1741 l/min) of water at a temperature of 46 °F (7.8 °C) to meet the new target temperature. The solution to lower flow was a custom TFRA, a right-angle spiral nozzle with a low profile. Spiral nozzles produce small droplets, which are ideal for heat transfer applications. The recommended full cone spray pattern offers better distribution than the hollow cone pattern from the previous setup.

The customer performed testing and reported a significant increase in the cooling efficiency over the hollow cone nozzles. Results confirmed that replacing the whirl nozzles with TFRA6FCN nozzles would only require 400 gpm (1514 l/min) of water at 46 °F (7.8 °C) to achieve the new desired outlet temperature. The TFRA solution decreases the pumping requirements by about 3,600 gph (13,630 l/hr), reducing overall operational expenses.

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