

Cool Savings

Process cooling system saves water, energy for New England BioLabs

Behind the scenes of the most cutting-edge genetic science lies the work and expertise of companies like New England BioLabs, Inc. based in Ipswich, Massachusetts.

For decades, NEB has provided enzymes for use in molecular biology research and clinical trials, serving a network of customers internationally. The organization recently completed construction of a 40,000-square-foot cleanroom production facility in Rowley, Massachusetts.

Pulling it all together was the project management firm Columbia Construction Company. According to Neal Swain, project manager, Columbia worked with AHA Consulting Engineers, Inc. for the building's engineering infrastructure, including the plant's process cooling mechanical system.

As is customary in the industry, AHA worked with suppliers to find the right equipment to meet NEB's specific requirements. Manufacturer's rep firm, Fluid Equipment Solutions of New England, provided technical assistance for the cooling system at this new facility.

TIGHT TOLERANCES FOR COOLING

Accurate and robust temperature control of the equipment and environment is critical to the success of the tightly controlled manufacturing processes.

A key component of the cooling system that meets the stringent cooling needs at NEB's facility is its fluid cooler, a 1.6 million Btu closed circuit cooling tower designed to provide cooling to process water for a wide variety of sophisticated plant processes.

"The fluid cooler provides condenser water to one side of a heat exchanger," said Thomas Joyner, partner, and AHA project manager. "The



From top: The New England BioLabs facility under construction. > New EVAPCO cooling tower modules are prepared for installation.

process water on the other side of the heat exchanger serves several pieces of plant equipment."

AHA experts considered several fluid cooler options. The amount of electricity and water used was a key factor in specifying the cooling system.

"We compared the performance of multiple evaporative fluid coolers in terms of meeting the required temperature, as well as energy and water use," said FES sales engineer, Ben McLaughlin.

Ultimately, EVAPCO's eco ATWB-H series hybrid fluid cooler was

selected. The system is specifically designed to optimize both the evaporative (latent) and dry (sensible) modes of cooling simultaneously — combining the advantages of an evaporative cooler and a dry cooler.

BALANCING ACT

McLaughlin explains, "There were three aspects of the fluid cooling

system that were critical for this application. The first was the cooling tower's wet and dry performance."

The hybrid fluid cooler has the ability to handle full capacity in "dry mode" up to an ambient dry bulb temperature of 50 F. This reduces water consumption for every hour of operation below 50 F when the water is turned off and the fan alone is doing all the cooling.

"In addition to water savings, the spray pump is turned off during dry cooling and that results in energy savings when compared to the standard fluid cooler using evaporative cooling only," said McLaughlin. "So we have about 60 percent less water used and a 30 percent reduction in electricity consumption."

The SAGE control system provided with the cooler plays a key role in optimizing water and energy savings. SAGE leverages outdoor or ambient conditions. The wet bulb and dry bulb temperatures are used to best meet load requirements, while reducing water and energy consumption.

ECO-FRIENDLY ACCESSORIES

Water treatment was also important. Necessary to maintain evaporative cooled equipment during wet operation, a substantial benefit to a primarily dry cooler is that scale cannot form when the unit is in the dry operation mode.

"We included the Pulse-Pure non-chemical water treatment system with the fluid cooler," McLaughlin explained. "This uses a high-frequency electromagnetic pulse to reduce corrosive or scale-forming solids, and anything biological; it renders microorganisms incapable of reproduction."

With EVAPCO's hybrid fluid cooler serving the manufacturing process, New England BioLabs' new cleanroom production facility achieves both high-quality product and lower water and energy consumption.

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