



High Efficiency Premium Chilled Water Plant

Systecon VariPrime® Chilled Water System

Project Needs

Lindt needed to replace an existing air-cooled plant at one of their high production facilities. The plant was at the end of its useful life and lacked the capacity to adequately support the facility's 24 hour a day, 365 days a year process chilling needs.

They wanted a new, **high efficiency system** that could serve the existing manufacturing load and **accommodate future growth** while **providing energy savings** - maximizing utility incentives and project payback.

Quick installation was also vital to the project. Lindt did not want to curtail production while the system was replaced, so they needed a system that could be installed quickly and provide a smooth transition from the old plant.

The Solution and Process

Lindt enlisted independent consulting engineering firm B2Q Associates, Inc. to determine the system needs and criteria. They analyzed efficiencies (being of primary importance), constructability, cost and scheduling to determine that a Systecon Inc. modular system featuring Trane chillers, while not the lowest in initial cost, would provide the overall optimal solution for the project.

The chillers were selected first. After comparing options presented by three chiller manufacturers, Trane water-cooled centrifugal chillers were determined to be the best choice to deliver the desired efficiency

Key System Components

- (3) 825 ton Trane water-cooled centrifugal chillers
M/N: CVHF1070
- (2) Marley open, crossflow, induced draft cooling towers
M/N: NC8414WAS2
- (3) 100 HP Patterson pumps
M/N: S10A13A-4
(3) 50 HP Patterson pumps
M/N: E6N13A-2
- Systecon Inc. VariPrime® variable pumping system
- Systecon Inc. controls with ABB PWM variable frequency drives
- Manufactured to Systecon Inc. construction standards



Then began analysis of how and where the system would be built. It included comparing traditional field built to factory-built options and reviewing multiple manufacturers. After assessing the data and visiting the factory, Systecon Inc. was selected to manufacture a new modular plant.

“After comprehensive analysis of all available options, Systecon was the superior option in terms of a design feasibility, economic, reliability and serviceability standpoint.”

**- Joseph Boisvert
Project Designer, B2Q Associates, Inc.**

Having the chillers selected prior to selecting the system manufacturer was not a problem since Systecon is accustomed to working *with* customers to design a system specific to their project needs. In fact, communication and teamwork were notable factors to the success of this project with weekly conference calls between the owner, engineer, Systecon, Trane, and the mechanical contractor Granite State Plumbing and Heating, LLC.

The high efficiency level of this plant was achieved through comprehensive analysis and design. B2Q modeled the chiller plant data for every hour of the year which was analyzed at specific temperature ranges to calculate overall KW hours for the plant. This data was used to estimate operating costs and determine the most efficient chiller solution.

Systecon’s VariPrime® variable pumping system provided the most efficient pumping solution for the plant. Using a single set of pumps to vary the flow of system water, VariPrime® maximizes chiller capacity - tying staging to load, not flow, and optimizes chiller sequencing with independent pump sequencing. It requires less energy than primary/secondary systems, less total connected motor horsepower and less space. Wire-to-Water Efficiency was also used to determine optimum pump selection, helping to further maximize the efficiency of the pumping system.

The entire system was manufactured to Systecon’s industry leading construction standards and utilizes Systecon’s

integrated controls with ABB variable frequency drives to achieve the best speed, reliability and redundancy.

Factory building the modular system at Systecon allowed the existing plant to continue operating throughout the construction and installation process. It also allowed the system to undergo factory testing to ensure the expected performance before delivery, facilitating a smooth and quick installation and start-up process.

Having an experienced, professional mechanical contractor like Granite State - committed to working as part of an integrated project team - also played a significant role in achieving the required quick installation.

Challenges

Determining the plant location was the biggest challenge to the project. While the Lindt facility has a large campus, there was limited space available to situate the new chilled water system.

The existing plant location wasn’t an option since production at the facility would have to be shut down for the length of time needed to demo the old plant and install the new.

Other seemingly prime locations would have blocked access to existing underground utilities or obstructed a fire lane. There were also local building codes to comply with and ordinances that prevented building the new plant too close to the property line and restricted the height of the plant.

Fortunately, Systecon’s in-house team of engineers is experienced in designing systems in the most economic, energy and space-efficient way. They were able to work with the project designer and engineer to determine the optimal plant arrangement for the space that was available.

“Working with Systecon made the process easy. They were very responsive and professional, making sure our needs were addressed and our project went smoothly.”

**- John C. Hobden, P.E.
Project Engineer, Lindt**

End Results

The transition from the old air-cooled plant to the new chilled water plant was as seamless as possible - everything remained online so there was no production lost due to the changeover.

Lindt now has a premium, high efficiency plant that provides the reliability they need and cost savings they want. The system is running effectively, meeting cooling loads and estimated to provide \$500,000 in energy savings per year.

They also have a system that can accommodate future growth with redundancy and expansion built in. Designed to operate all three chillers but only use two and using a VariPrime® pumping system which can easily handle future expansion, the system is prepared to support additional capacity when needed.