



AN INDUSTRIAL WORK OF ART

CITRUS SYSTEMS, INC.



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Citrus Systems: An Industrial Work of Art

Juice never had it so good. That is, when it's pasteurized by Citrus Systems, Inc. in Hopkins, Minnesota. Founded in a 100 square foot mini storage locker in 1985, the company has grown in expertise and scope to its present size of 132,000 square feet in a state-of-the-art facility—just a stone's throw from Minneapolis.

Their Products & Market

According to Thomas E. Boehland, founder and president, “we are a private label juice manufacturer that specializes in a wide variety of juices and fruit drinks.” He continued, “Pasteurization is our critical control point in our HACCP Program (a food safety program regulated by the FDA). All of our products are pasteurized so they go through the heat treatment process and, more importantly, the cooling process on the other side.”

“We do some of our own label for the institutional side, but primarily we pack for many of the local dairies, for retail grocers, retailers of various sizes and institutional customers. During the Gulf War in Iraq, we supplied the troops with juice for approximately four years.” And, they continue to supply juice to the US military as far away as the Pacific Rim.



Citrus Systems Cold Storage Warehouse

Mechanical, Citrus Systems' long-time refrigeration contractor. The equipment was custom-designed and built by Zero Zone, Inc., located in Ramsey, Minnesota. Each component was engineered by Zero Zone for optimum performance for the application. The low temperature compressor rack system operates at -23°F to provide 82 tons of cooling to the freezer spaces. The medium temperature compressor rack system operates at $+20^{\circ}\text{F}$ to provide 124 tons of cooling to the cooler spaces. The chiller package includes four independent compressor/chiller circuits operating at $+18^{\circ}\text{F}$ to provide 240 tons of chilled glycol cooling to the process and product tanks.

The refrigeration systems are engineered for performance with features to provide trouble free, energy efficient operation for this critical part of the production process. Zero Zone included features and technology to match the challenges of this industrial application. Multiple chilling circuits provide smooth response to rapid changes in the process cooling demand. Industrial PLC controls provide dependability, flexibility, and connectivity critical to Citrus Systems operations. Evaporative condensing with variable speed fan control minimizes the overall electric power demand of the systems. Thermal recovery of compressor discharge heat generates hot water for use in the production facility while reducing both electric and natural gas demand.

Remote Diagnostics

Key to the success of their HACCP plan is being able to assure that the system is running properly at all times. That is why they use a remote diagnostics system linked to the refrigeration equipment to monitor operation and communicate any alarm conditions. Thomas points out, "With the remote-login to the system, they are able to go online and see what's going on before we even know that there's a problem. With the alarm setup and everything else, all the information is right there, so even before someone comes out they can fix it remotely. We count on it. If there is a time when we need service, they have always been there."

The Refrigeration Systems

Citrus Systems has two pasteurizers, six packaging lines, 18 blending and storage vessels, and over 560,000 cubic feet of temperature-controlled storage. Zero Zone provided the facility with three separate refrigeration systems. Two independent systems serve the storage freezer and cooler spaces. The third system serves the process system and tank cooling. Thomas notes that the right amount of cooling capacity is critical to their ability to run production at the proper speeds. "We put some pretty substantial loads on the process system with the two pasteurization systems, so it's critical that we have the cooling capacity to be able to operate at the tonnage that we require," he says.

The refrigeration equipment was specified by Market Mechanical, Citrus Systems' long-time refrigeration contractor. The equipment was custom-designed and built by Zero Zone, Inc., located in Ramsey, Minnesota. Each component was engineered by Zero Zone for optimum performance for the application. The low temperature compressor rack system operates at -23°F to provide 82 tons of cooling to the freezer spaces. The medium temperature compressor rack system operates at $+20^{\circ}\text{F}$ to provide 124 tons of cooling to the cooler spaces. The chiller package includes four independent compressor/chiller circuits operating at $+18^{\circ}\text{F}$ to provide 240 tons of chilled glycol cooling to the process and product tanks.



Industrial Chiller System

Reliability & Quality

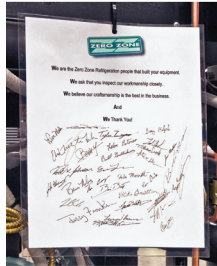
As Thomas notes, “We rely on the reliability and the quality of the system and of the service to make sure that it is meeting our needs.” “So far it’s worked very, very well,” he emphasized. “It’s efficient in how it comes online and how it rises and falls with our demand. The key element in this business is cooling and refrigeration. Our products are frozen and refrigerated and go through a cooling process in the production side so, without any of those, we can be dead in the water.”

Thomas takes a great deal of satisfaction in how everything came together, saying, “it’s been outstanding and you can tell that there is a lot of pride in what they put together. When I bring people in the plant and show them the refrigeration and the racks—I mean their eyes do light up when they look at it because in its own way it is kind of a work of art. It shows off very well. It isn’t just a bunch

of refrigeration components that are cobbled together on-site to get the job done. It’s a nice package and you can tell just looking at it. The factory people take pride in it and even sign off on the equipment with each individual person putting their names to it. I mean you don’t see that very often these days.”



Medium Temp Industrial Rack



The Bottom Line

In the pasteurization and food processing industry, consistency and reliability are crucial in order to maintain the integrity of the product. Zero Zone is proud to have collaborated with Market Mechanical to create a customized refrigeration “work of art” for Citrus Systems that will maintain the high standards of quality and reliability that are essential to success. And, we are happy to say that Thomas Boehland agrees: “Everything that it was designed to do, it’s done. We all have our choices in equipment and contractors and I’ve put my faith in Market Mechanical and Zero Zone to do what we need to be done.”



Zero Zone Refrigeration Systems

The Refrigeration Systems Division of Zero Zone, Inc. has been a leader in refrigeration systems and electrical control innovations for over 40 years. We maintain our position by listening to our customers, both contractors and end users, and continually reinventing our products through state-of-the-art engineering, custom-tailored to each application. We also put our products through over 1,000 precision quality control checks to assure uncompromised system integrity. Our systems are legendary for their ease of installation and their convenient service access, providing excellent value in a reliable, energy-efficient package.



Chilled Glycol Pump Package

For more information about this Case Study, contact:

Zero Zone, Inc.

800-247-4496



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