

Seamless Integration of Hardware and Software is Major Benefit for U.S. Manufacturer



Clean Rooms and Cold Storage

Controlled Environment Structures (CES) performs design and build contracting services in the construction of food storage, food processing, clean room, and environmental test facilities. Additionally, CES is a manufacturer of wall systems for use in the cold storage and clean room industry and they also manufacture special air handler units and fan/filter units for use in clean room air systems.

CES is a privately-held, owner-managed company with 30 employees. The firm operates out of a company-owned 45,000 square-foot manufacturing facility located West of Boston, Massachusetts. CES is one of the area's largest contractors in the cold storage/environmental room industry. They primarily service the six-state New England region, yet operate on a worldwide basis.

The business is divided into two main segments, namely clean room/environmental room construction and cold storage construction.

Clean Room/Environmental Room Construction

The clean room and environmental room construction side of the business involves the design and construction of turnkey special use rooms. CES provides a single-source solution, engineering a custom environmental solution to the client's specific storage, testing, or manufacturing needs.

Environmental rooms typically break down into two types; constant condition and variable condition. In constant condition environments, clients typically require steady-state temperature, pressure, and humidity

environments in the storage of goods or in the manufacturing of products. Such rooms run the gamut of environmental conditions. For the biotech company Burroughs-Welcome, CES designed and built a -20° C freezer with a redundant refrigeration system for the storage of Interferon. Biomerieux Vitek required a "dry" room, providing a constant 70° F, 15 percent RH for the packaging of chemical components.

In variable condition rooms, clients typically have the need to test a product under environmental stress or to simulate the conditions in which the product will be exposed to in the field. For Telco Systems, a manufacturer of fiber-optic telephone switch gear, an environment was created that cycled the room temperature from a low of -40° F to a high of +140° F. Exact temperature settings and cycle ramp times are user-adjustable.

Cold Storage Construction

In the execution of the cold storage side of the business, CES-manufactured "Foamwall" panels are used in the building of cooler, freezer, and food processing facilities. This work mainly involves the manufacture of insulated panels and doors for use in wall and ceiling structures. Installations may consist of small cooler and freezer units for food processors to large-scale distribution facilities and warehouses.

Controls Division

In 1994, CES expanded its business to provide environmental control systems; the goal being to offer more services to the existing client base. Rick Coan, a founder of PLC manufacturer AET Systems, was brought in to head this division. One of the first tasks was the selection of a PLC vendor. After an extensive review of the industry and related trends, Opto 22 was selected as the company's high-end controls vendor. A key reason was the solid synergy of the company's hardware and software products.

CES was selected as one of Opto 22's first OptoPartners in the northeast region and a Beta installer of the M4 RTU controller.

Control systems are marketed primarily to the company's food storage and food processing clients and their clean room /environmental room clients. The food industry exhibits an ever increasing need for control systems. Regulatory pressure and the manufacturer's quest for improved quality control necessitate improvements in temperature control, operational efficiency, and data recording.

The complexity of clean room air flow dynamics — and the rigors of environmental room control sequences — require the application of control systems that support a flexible input/output configuration and offer sensing accuracy, programming power, and the availability of a simple, yet dynamic graphical interface. Typical CES clients store or test products with a value in the millions of dollars, therefore the costs associated with a failure are high. These applications exhibit the need for a durable and highly-reliable product. The Opto 22 product line excels in all areas.

To promote the company's products and services, CES is staffed with six sales engineers. Three of these sales personnel are full-time sales. The remaining three share sales and management duties. In the support of the Opto 22 product line, three people are trained in the Opto product selection, Cyrano programming, system installation and debug, and MMI development.

CES believes in providing a quick response to a client's problems and allowing the client to be self-sufficient in the operation of their control system. To this end, all CES Opto 22 systems are outfitted with modem communications. Clients have access to a CES engineer 24 hours a day. Via phone line, their personnel are able to diagnose problems and effectuate solutions.

Additionally, each system is outfitted with an MMI interface. Great care is taken in the design of the Cyrano/MMI software to allow the client to adjust critical operational parameters. Training of the client is a standard facet of all projects. "It has been our experience that the more educated the client becomes, the more they return to CES for services," said Rick Coan, Division Manager for CES.

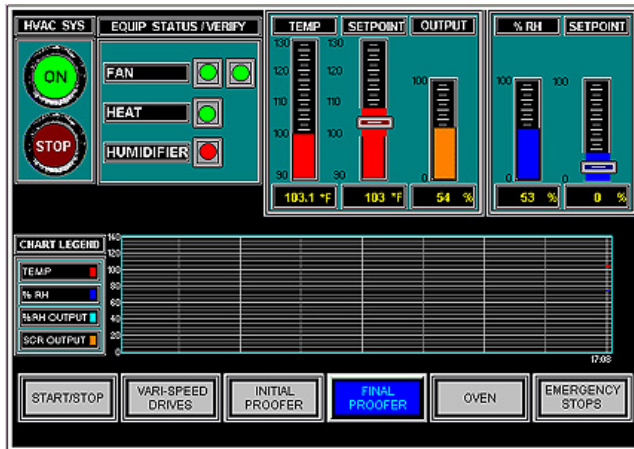
At UNO Foods, Opto Makes the Dough

CES was approached by UNO Foods to provide environmental rooms (proofers) necessary in the fermentation process for a new pizza and calzone line. CES sold the proofers and sold the client on the advantages of an automated process line operated by Opto 22 products.

The Opto 22 system controls all product partitioning, conveyor system speeds, flouring, fermentation temperature and humidity, and the operation of the commercial baking oven. The operator interface is provided via MMI running on two industrial touchscreen computers located along the line.

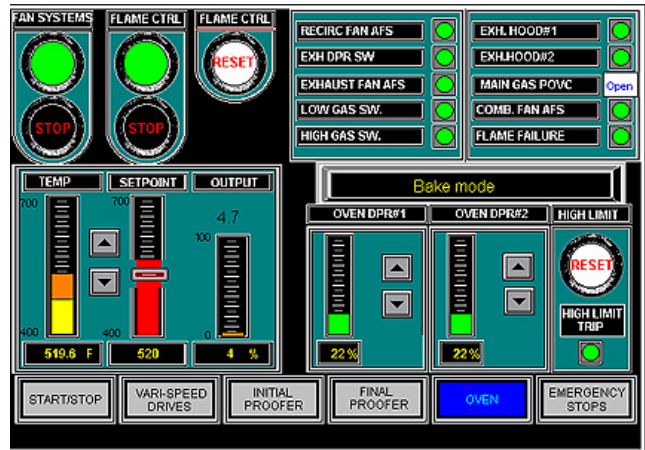
The upper MMI control screen controls the fans, temperatures, and conveyors for the 60-foot commercial oven used to bake the pizzas and calzones. PID control on the I/O units is used for temperature control. Since different products have different temperature profiles, a dynamic trend of the oven temperature assures the operator of proper bake temperatures.

The MMI screen on the bottom shows the conditions in the "proofer." This is the chamber that the dough runs through during the final stages of fermentation. Opto controls the speed of the conveyors through the proofer as well as the temperature and the humidity of the chamber.



Opto 22 and Critical Air

CES, in partnership with PRI Automation, provided product and services in the construction of Samsung's \$3.1 billion R&D chip fabrication facility in Kihung, Korea. PRI manufactures robotic materials handling



equipment used in the movement of silicon wafers in Samsung's Class 1 fabrication facility. CES provided the critical air systems to nine PRI stockers. Stockers are robotic storage areas for the silicon wafers. Any one stocker can hold from one to three million dollars of product.

An Opto 22 control system was provided to monitor and control the air system to each stocker. CES manufactures Fan/Filter Units (FFUs) which provide the vertical air flow to the stocker. The FFUs operate with UPS power. In the event of a power failure, the CES/Opto system will regulate the air velocity in the stocker to maintain the delicate pressure balance and therefore minimize the potential of particle contamination. An MMI interface complete with Korean voice interface was provided.