



Case Study

Harnessing advanced technology
for a complex coldstore application

Services: Refrigeration Design and Manufacture

Project Overview

A global veterinary health care provider approached Orwell Design Associates (ODA) to support their new state-of-the-art facility. As a leader in their field, they develop vaccines, antibiotics and a range of products that help to prevent and cure disease in the animal population.

They approached ODA with a brief for coldstores to house their pharmaceutical goods, presenting challenges that would require both technical and design expertise.

The client required the following:

- Supply of six high and low temperature coldstores
- Panel and control design
- Electrical installation services

The client's brief had three key requirements:

- Develop their refrigeration specification
- A system that operates to strict temperature tolerances for a coldstore of 10m high
- A system that has 100% standby and back up

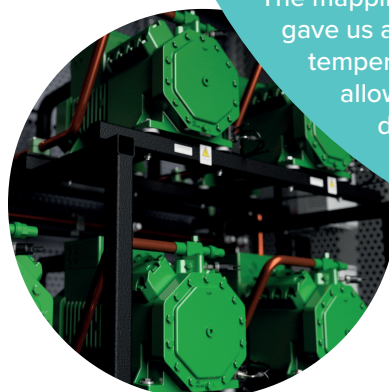
The client's specification, and the testing and validation of the systems involved would require a high level of design and delivery accountability. ODA's breadth of knowledge across refrigeration, mechanical and electrical disciplines made us the ideal partners for this challenging project.

Our Solution

ODA carried out Computational Fluid Dynamics (CFD) modelling to verify the system design, which was then used to develop the client's refrigeration requirements. The CFD simulation allowed us to verify our design before installation, which minimises the risk of any design modification after installation, this is especially important for innovations.

In this instance, we modelled the temperature gradients in the coldstore throughout the day, replicating the typical operation over a 24-hour period with the design parameters (equipment technical data, different equipment location options), room configuration, activities inside the room as well as the environmental conditions.

The mapping of these parameters gave us a close to actual room temperature distribution, this allowed us to finalise our design to meet the client's requirements.



For further information on how Orwell Design Associates can help your business, please contact:

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“The client chose ODA for this project on the basis of our design and technical capabilities, and our excellent reputation in the refrigeration industry.

The post-design CFD verification confirmed our design confidence and further enhanced our knowledge. The system is now running smoothly and the client is very satisfied with the temperature distribution and temperature fluctuation range, which is well within $\pm 1^{\circ}\text{C}$.”

Sharon Huo, Technical Development Engineer, Orwell Design Associates

“The solution ODA proposed exceeded the customer’s original specification on a number of levels. Our system would provide more functionality, extended life expectancy and reduced energy consumption.

At ODA, we recognise that wherever high levels of very specific technical design are required, a close working relationship between the Design and Installation teams is critical. ODA’s collaborative approach to project delivery, and a single point of contact, meant we delivered this project without the usual additional time delays and stalling points caused by using separate contractors.”

Bill Buckenham, Senior Design Engineer, Orwell Design Associates



Challenges Faced

The project posed a number of challenges. The variance for temperature within the 10m high cold store was strict and had to remain within 1 or 2°C of optimum temperature. The system also required a 100% standby and backup to ensure that items stored in the coldstore remained at the required temperature at all times. Furthermore, a timely project delivery was crucial as the customer’s schedule was particularly tight.

Key Benefits

ODA reviewed and refined the brief to deliver efficiency, cost effectiveness and value to this customer for their brand new facility.

ODA installed two dual temperature Classic Mini Packaged refrigeration systems with 100% backup and evaporators with interlaced coils, and a central plant as opposed to individual condensing units that were proposed in the original specification.

We suggested using a central plant, which runs multiple evaporators as opposed to individual engines running single evaporators. This saved space on site and will save energy and money over the course of the product’s lifetime because these allow for smoother pack control which is more efficient and thus provides an extended product lifetime.

The two HFC refrigeration packs are controlled to cover 50% load on each during normal operation. The interlaced evaporators are used to achieve 100% back up and also have the added benefit of saving space. It’s a product that is designed to fit in a finite amount space but that works efficiently to meet the demands the client places upon it.

Design Experience

Our in-house team has a wealth of experience to help provide an integrated design service as part of our wider refrigeration, mechanical and electrical offering. The successful completion of this project is a great example of our capabilities in developing customised temperature control solutions where this is critical to the production process.

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