

# CHILLED & FROZEN DISTRIBUTION HUB

The first of its kind in the UK for a leading on-line retailer, Orwell Design Associates were tasked with designing the refrigeration equipment for a new **£Multimillion chilled and frozen facility.**

With a view on energy efficiency and future proofing of the refrigeration equipment, the best choice was a natural refrigerant; CO<sub>2</sub>.

Working with the client on the expected room usage, we were able to calculate the heat loads. This was designed to a +35°C outside ambient, with 70% resilience between 2no refrigeration systems.

Each system has multiple compressors to share the running loads

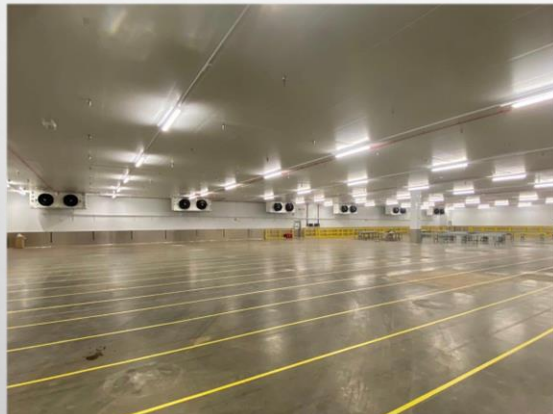
The chilled design set point was +1°C and the freezer design set point was at -23°C.

To ensure energy efficiency we included parallel compressors, lead compressor inverters, EC Fans and stepper expansion valves.



There was a restriction to the plant area footprint, so it was important to ensure the external equipment design was suitable. For this reason, a V-block gas cooler was selected.

Environmental aspects had to be considered and overcome. Noise levels were met, inverters were used for capacity control, future heat reclaim potential was included with a matrix of potential heat output to consider.



Some of the notable design elements of the project were:

- Evaporator structural support design, split in pack / evaporator allocation to ensure full room operation in the event of a single plant failure.
- Fire strategy review with door positions worked through and established.
- Vertical evaporator pipework tails to limit condensation.
- EC fans, freezer evaporator air socks and rear damper for the best possible defrost.
- Strategy of positioning leak detection beacons / sounders & sensor locations to ensure persons and equipment were best protected.
- Shared containment coordination of refrigeration services with other disciplines.
- Evaporator valve board drip trays included with connections to drain headers.
- Clear access locations and route highlighted above cold rooms for service and maintenance.
- Internal support with commissioning team providing a 'commissioning intent' document covering set point & operation of all equipment.

Working to a short time scale and delivering the project during the COVID pandemic, it was delivered on time and on budget.