

Low temperatures at low cost

Increased concerns on energy efficiency has led to major changes in the refrigeration sector

The lengthening of supply chains and the increased interest in energy efficiency has led to many companies reviewing their refrigeration options and looking for more cost-effective ways to meet their needs. Yet in retail and catering environments, there is still the requirement for convenience and style to be considered.

Energy efficiency is certainly a major factor for many in the industry, and those who attend the ACR Show this month will witness a sector undergoing a host of changes. Air conditioning and refrigeration equipment for example accounts for around 20% of the total energy consumption in the UK, and at a time when businesses are being required to review their energy usage, these are likely to make the biggest contribution. Running costs can also be quite significantly cut with a reduction in the amount of energy being used. Heat recovery for hot tap water, intuitive control systems and operator web interfaces, and use of EC fans and inverter driven compressors have all helped make a difference in the new refrigeration solutions.

Across Europe, The Energy Related Products Framework Directive has helped the sector develop MEPS that will improve the environmental performance of all refrigeration and freezing equipment in the EU. Most commercial refrigeration systems currently sold in Europe operate above the energy consumption minimum standard required with the new directives clearly having an effect.

With this in mind, CESA is currently conducting industry-wide research into attitudes towards energy saving and plans to unveil the first findings at the forthcoming Hotelympia show. Called 'Mind the Gap', the project focuses on the differences in approach to sustainability between manufacturers, distributors and consultants. CESA's Mick Shaddock says, "CESA is working

with European legislators to develop the measures that will be implemented under the Energy Using Products Directive. The research project is a real

opportunity for the supply chain to identify its performance and benchmark activity in terms of energy saving and sustainability. The research will not only benefit companies, it could have a direct bearing on future legislation and regulations."

In the UK, the British Refrigeration Association and Institute of Refrigeration have worked together to support a code of conduct regarding carbon reduction in the retail refrigeration sector. Retail refrigeration systems are a significant contributor to UK carbon emissions, producing around 7.3 million tonnes of CO2 equivalent per year – about 4% of the annual total.

The new code of conduct has been compiled by the industry in an attempt to reduce CO2 emissions in the sector by around 20% over the next five years. This will not only save costs, but also assist the sector in adhering to regulatory requirements. The code has already been incorporated into the BREEAM building assessment methods for 2011 and, with retailers constantly updating their refrigeration plant – around 25% of sites



are planning to buy new plant at any one time – it's highly likely to make a major difference very quickly.

Illustrating the importance of maintaining the very highest standards in the industry, the British Refrigeration Association have also commissioned a further code of practice on the design and

manufacture of refrigerated cabinets running on hydrocarbon refrigerants. The code will clarify the regulations, standards and practices which apply to the leak simulation testing and subsequent design of these systems, and provide the basis for a consistent approach to be adopted by all manufacturers, end users and specifiers when using these refrigerants.

The rate of change in the industry is usually led by the compressor manufacturers, and they are increasingly making use of new refrigerants and new technologies. For example, Husky have launched their Intelligenza range which, it's said, could reduce energy consumption by as much as 40%. Chief executive Geoff Thomasson says, "At its core is an advanced system which balances the performance of up to six super-efficient fans with the energy needs of the evaporator and compressor."

The units can identify when doors are opened and recognise when usage is low, at which time they switch to economy 'night mode', permitting temperatures to rise slightly and shutting down fans and lights. When the doors are opened – or at a predetermined time - the system kicks back in to full operation.

In addition, the system generates significantly less in-situ heat, and uses environmentally safe R290 refrigerant, improved insulation and silvered glass which is the equivalent of triple glazing. The units are also illuminated with LED

lighting which saves energy and lasts for 100,000 hours.

Meanwhile, Precision's latest blast chiller uses microprocessor-controlled, variable speed fans to ensure that blast chilling or freezing is fast, efficient and consistent throughout the cabinet. The chiller can chill or freeze up to 35kg of food, within government guidelines, using only a

standard 13 Amp supply – not usually possible with a conventional chiller. Examples such as this illustrate the major advances that are taking place in the sector.

Ever-lengthening supply chains also bring with them new challenges for refrigeration. Businesses must ensure absolute product integrity at every point from the factory to the shop shelves, and so effective temperature monitoring and data logging is essential. Companies such as Rotronic have a host of product lines available for measuring humidity and temperature, as well as advanced wireless data loggers.

One of Rotronic's major success stories in recent years has been the HygroClip2 with integrated AirChip3000, which emphasises precision, applicability and reliability. The AirChip3000, which can be used in everything from simple measurers to sophisticated laboratory instruments and data loggers, compensates temperature and humidity over 30,000 reference points and has a 2000 data point memory.

By decoupling the Pt100 temperature sensor from the probe, thermal response is significantly improved, and the UART interface and user scalable analogue outputs allow the probe to be used as a standalone device that can also be integrated into an OEM application. The probes can be interchanged without adjustment.

The huge advantage for users is that as well as its datalogging and calibration history providing information about the current state of the product, its self-diagnostics can also help make predictions on what will happen next, and it can even provide dew point values.

As well as ensuring the machines and testing equipment is of the highest standards, the refrigeration sector can now also benefit from exceptional training programmes which means those working in the sector can be even better informed. Indeed since last year, all personnel

handling F-Gases have had to be suitably qualified, with all businesses holding a company certificate.

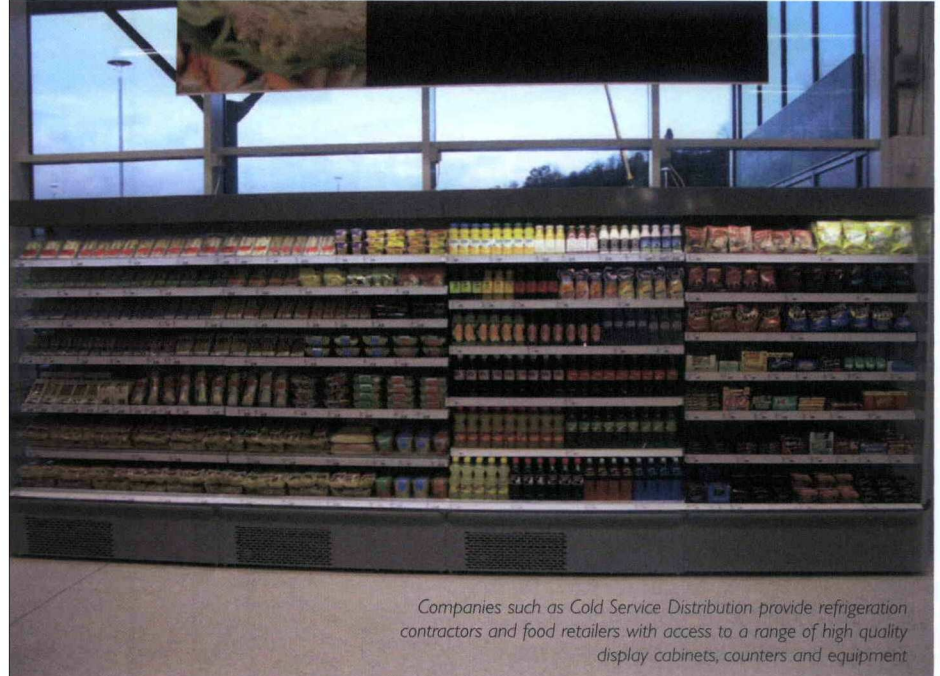
In recent years elearning-training.com, the online training platform by Star Learning Solutions, the training division of Star Refrigeration, have been offering CO2 Refrigeration training for retail

operators Marks & Spencer and Tesco using a method involving theory underpinning knowledge online and one day practical assessment or training. This means that when candidates arrive to the centre for practical training, they have already mastered the basics.

Recently introduced by the organisation is a new pressure testing training course including strength test and tightness test, which is completed in the same format. The practical training involves the safe use of equipment, compliance to all method statements and risk assessments while

carrying out strength and tightness testing and correct completion of all necessary paperwork, and knowledge of leak repair procedures on a system while carrying out a strength and tightness test.

The refrigeration sector will play a major role as the industry looks to reduce energy consumption – and improved equipment and training schemes ensure it can make a real difference.





Precision are among those companies providing robust, dependable, quality refrigeration for commercial catering environments