



A chiller for Biscuit Manufacturing Giants

Healthier low fat production lines

United Biscuits is one of the UK's leading manufacturers of biscuits. The introduction of a healthier version of McVities Rich Tea biscuits with a 50% reduction in saturated fats required the modification of production facilities at the manufacturing giants' Harlesden factory to support the changeover. This included the installation of new air cooled chiller plant from Daikin UK to provide chilled water.

Although the Harlesden factory is the largest biscuit manufacturing plant in Europe and its process cooling lines and air conditioning were already served by 2500kW of cooling supplied by seven existing Daikin glycol chillers, the decision was taken to introduce additional plant to provide the extra cooling needed for the new low fat alternative.

The new R410A 130kW chiller was required to cool 28 ton loads of sunflower oil, delivered from the manufacturers every few days in tankers, at a temperature of 300C, a temperature somewhat higher than could be handled by the existing biscuit production plant. As a result, specialist contractor, ITEC Industrial Services Ltd, Halesowen, West Midlands – a company, which in the last few years has engineered and supplied all the site's cooling requirements – was engaged to design, project manage and install the new chilled water system.

After delivery, the sunflower oil is transferred to one of three holding tanks and then pumped through three 6 metre long 'hygienic' shell and tube heat exchangers mounted in series

to be cooled down to 250C over a 2 hour period. During this 'blast cool' mode the chiller supplies glycol at 50C.

On reaching 250C, the oil is circulated around the production line piping, which is jacketed with warm water fed via plate heat exchangers at just above 250C if the oil temperature is too low and just below it if the oil temperature is too high. The oil is then transferred at the correct temperature to the giant biscuit mixers as necessary.

The chiller is then reset to supply water at 100C during this part load phase in order to improve efficiency and reduce running costs and since the part load rarely exceeds 25% of total load, the part load efficiencies offered by the EWAQ chiller's scroll compressors are of great significance.

According to ITEC managing director, Bob Garner, the dual chiller set point facility of the Daikin EWAQ130 chiller, plus its excellent part load efficiency - particularly important in matching the flexible process cooling requirements inherent in food production - were major factors behind its choice for the McVities plant.



At the end of each production run the heat exchanger is 'cleaned in place' by an initial flush through with water at 65°C to remove any unwanted solids or bacteria and sanitized prior to a second flush out.

The Daikin EWAQ130 air cooled chiller has multiple reliable and highly efficient scroll compressors, which return a high EER value at full load and excellent part load efficiencies and a new Pcaso' controller with user friendly and powerful LCD interface. Also, electronic expansion valves, rare at this low capacity end of the market, ensure precise capacity control.