LED LIGHTING:

costly, but robust and economical in the long run

LED lighting works well at low temperatures and provides a clean, bright white light, which is why freezer specialist Starfrost was attracted to the idea of installing LED lighting in its novel spiral freezer unit. But freezers, like all food processing equipment, are subject to vigorous cleaning, and this called for specially sealed units. Fortunately, IDEC had a ready-made solution

Starfrost's novel spiral freezer unit showing the low-level in-feed and high level exit conveyors, and the spiral freezing zone within

A close-up of the IDEC IP67f rated LED lighting strip, featuring stainless steel housing and reinforced polycarbonate lens, as installed in Starfrost's spiral freezer unit

Starfrost (www.starfrost.co.uk) and its parent company Star Refrigeration were recently chosen by the Humberside Seafood Institute to supply a turnkey freezing system, consisting of a packaged spiral freezer and a low temperature packaged refrigeration plant. The spiral freezer comprises a novel and innovative system of magnetic coils designed to snap freeze food products, minimising crystal growth and thus ensuring that taste, texture and aroma remains as if it were fresh after the product is thawed. The equipment, although compact and intended for research into the effects of freezing on certain food products, has been designed to freeze commercial quantities so as to replicate actual factory conditions and process line flow.

Product is loaded on an Ashworth Hybrid plastic conveyor belt, located at low level external to the freezer, and conveyed into the spiral freezing zone. Here, the product is subjected to fast flowing air at a temperature of -42ºC as it continues through the system, spiralling upwards through the freezing zone before leaving the unit at high level, fully frozen.

Good lighting within a freezer enclosure is very important, not only for safety reasons but also for thorough and reliable viewing during cleaning, maintenance and regular inspections

The spiral freezer was built in food grade stainless steel with Starfrost's 'clean-by-design' principle employed throughout. This ensures that when the cleaning system is operated, minimal manual intervention is required between the finish of one freezing shift to the start of another. A seam welded self draining floor system, sloped structural member surfaces and hygienic design principles ensure that water usage is kept to a minimum and hygienic conditions are maximised.

Shedding light on the process

Good lighting within a freezer enclosure is very important, not only for safety reasons but also for thorough and reliable viewing during cleaning, maintenance and regular inspections. Because of the low temperature operation and vigorous cleaning action involving hot water jets, a special lighting system was required for this unit.

LED lighting operates well in low temperature conditions and, in fact, works better the lower the temperature, so Starfrost set out to find a supplier who could supply a reliable LED unit capable of withstanding the cleaning conditions within the enclosed space. The company eventually settled on the control and automation specialist, IDEC, which offers various LED lighting fixtures for a range of duties, including units appropriately housed for aggressive machine tool environments and electrical enclosures.

The company's Lumifa LED light strips, in particular, use one third the power of fluorescent lamps and have a maximum lifespan of 40,000 hours. Once one of these units is installed, it can be effectively forgotten! The IDEC unit chosen by Starfrost for its spiral freezer features a stainless steel housing and reinforced polycarbonate lens, the complete housing being rated to IP67f. Not only is this fitting suitable for low temperature operation during the freezing mode, but its sealing class means it is also capable of withstanding the effects of hot water sprays during the machine's cleaning cycles.

Starfrost also wanted to offer its customer a 'clean white light' which LEDs provide, unlike the 'yellow' light of sodium units often used in freezing systems. In addition to consuming less power than conventional lighting systems, LED light fittings operate from a low voltage supply, which has obvious safety benefits.

LED lighting units cost considerably more than other light systems, but the benefits they bring will likely see them being taken up more widely in the future - and not just for special condition applications, as Starfrost discovered.

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