



VLT® SyncPos control hots up choc ice production

At Frederick's Dairies ice cream plant in Skelmersdale, they try to meet a seemingly insatiable demand for choc ices, manufacturing, on just one of its lines alone, close to 1,000,000 choc ices daily, from May to September. At this rate of production, downtime is costly so system reliability is critical.

Twenty four continuous lanes of solid ice-cream bar flow from the blast freezer, to be cut-to-length and enrobed in chocolate before passing through the after-cooler to solidify the chocolate. Every 2 seconds, a line of 24 choc ices drops into a 24 to 12 transfer plate which is mechanically linked to the wrapper. The cam-driven transfer plate then flips back to a horizontal position and offset push rods position 12 of the ices in the 12 wrapper lanes, leaving the remainder on a receiver plate.

The receiver plate moves one position sideways and the remaining 12 bars are pushed into the wrapping lanes, before the next 24 bars are received from the transfer plate.

The cutter, chocolate enrober and after-cooler are all ac variable speed driven from the same 0 - 10v speed reference. Synchronism between the cutter and the wrapper/transfer plate is critical. Otherwise there would be frequent jamming of the line with significant loss of production.

Frost disturbed synchronisation

Initially a through beam photocell on the end of the after-cooler plus a proximity switch on the transfer plate formed

a timer/counter feeding to a PLC which corrected the 4 - 20 mA speed signal to the Danfoss VLT® wrapper drive, keeping the wrapper in sync with the cutter.

This was frequently problematical because of the low ambient temperature, with mist forming in front of the photo-cell or condensation forming on the lens and subsequent loss of synchronisation. Curling of the edges of the after-cooler conveyor-belt, or loose strands of the belt, also caused false triggering and sync loss.

As often as not, the operators would disconnect the photo-cell and run the line without autocompensation.

Without continuous corrective input via manual speed correction buttons, the line would lose sync and frequent product pile-ups did occur.

VLT® SyncPos

When the ageing wrapper drive was replaced with a new, physically smaller VLT® 5000 drive, Mike Sexton, Electrical Systems Manager at Fredericks decided to install the optional Sync-Pos feature.

By fitting encoders to the cutter and wrapper drives and deriving marker pulses from proximity switches fitted to the cutter and transfer-plate bottom posi-

tions, the optical system and the PLC could be superseded. Add/subtract position increment pushbuttons at the after-cooler operator station were added to enable fine-tuning of the positioning to be achieved simply by the line operators during production.

“Position synchronisation using the Danfoss Sync-Pos card alone is accurate enough to ensure that the transfer plate is always in the correct position to receive the choc-ices after each cycle and requires only occasional adjustment via the offset buttons to compensate for ice build up on the after cooler belt drive roller, which happens after several days non-stop production,” remarked Mike Sexton. “I also found commissioning the Sync-Pos system surprisingly simple. We modified

the system during a short maintenance window and commissioned it ourselves. Everything fitted into the existing control panel which saved quite a bit of time and cost. During commissioning we made a couple of phone calls to Danfoss for clarifications but apart from that the calculations and settings were straightforward and the line now runs problem free with significantly improved production”

