

AUTOMATION

case study

Independent drive system for flatbread line achieves payback in just 6 weeks

The problem of increasing downtime and soaring maintenance costs on a Pizza production line has been solved with the installation of variable speed drives, motors and gearboxes from Control Techniques Ireland.

The Challenge

At The Flatbread Company, based in Clara, County Offaly, in Ireland, a high throughput baking, cooling and packing line for pizza bases was suffering from a significant drop in production because of repeated mechanical breakdowns. An average loss per week of 4.5 hours production time, equated to a reduction in output of some 8,000 pizza bases — a loss of over \$2,348 (€2,000) in product! The weak point in the line was proving to be a series of nine 32 ft (10-meter) long conveyors that take the cooked bases through an air-cooled section prior to packing. Three meter long drive shafts for each of the conveyors were being driven by a system of chains and sprockets from one large geared motor, with very high torque. Frequent jams, caused by a dislodged pizza and the consequential build-up on individual conveyors resulted in broken drive shafts. Knock on effects were a halt to production and high maintenance costs as new, tailor-made drive shafts had to be specially machined to replace the broken ones — amounting to high annual maintenance costs of around \$4,110 (€3,500).

The Solution

Gerard Naughton, maintenance manager at The Flatbread Company, decided that individually-driven shafts would provide an answer to this maintenance headache and contacted the local Control Techniques Drive Center in Newbridge, County Kildare. The proposed solution comprised nine separate 0.49 HP (0.37 kW) Control Techniques' AC drives, inverter driven motor and gearbox combinations, each one capable of operating completely independently of each other. The inverters are 0.5 HP (0.37 kW) Control Techniques' AC drives, which power WEG 0.33 HP (0.25 kW) three phase AC motors that are geared down using Rossi's brand new "Standardfit" Worm Gearmotors.

The Benefits

The result has been an increase in production over and above expected since the inefficiencies associated with continuous starting and stopping have now been eliminated thanks to the precisely synchronized line control. With the reduction in breakdowns giving an annual saving of around \$4,110 (€3,500), plus the increase in output, Gerard Naughton estimates that the installation has had a payback of just six weeks. A key benefit is that each inverter is operating as a highly sensitive torque limiter, preventing shaft breaks in the event of conveyor jams. If a jam occurs, the relevant drive will sense an instant surge in current and the control system will shut down the 8 cooling conveyors immediately, the top feed conveyor drive is programmed to run for an additional 30 seconds to empty any remaining pizzas in the oven. "However, the variable-speed drive solution has given us other benefits too," says Gerard Naughton. "Because we can control line speed more precisely, allowing us to space the product out or in, we have been able to find an optimum speed to suit oven output and the speed of the packing machine," he says. "The old system of chains, tensioners and sprockets caused a jerky movement, but, now, the whole system is very much smoother, reducing jams too. What's more, reducing motor speed from 50 Hz to 41 Hz and the reduction in losses because each motor and gearbox is directly coupled, has also cut our energy usage too — a bonus we hadn't anticipated!"

KEY BENEFITS

- 6 week payback
- Increased productivity
- Slashed maintenance costs
- Optimum output
- Synchronised line control

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